CRITICAL ECOSYSTEM PARTNERSHIP FUND

Ecosystem Profile

Guinean Forests of West Africa Biodiversity Hotspot

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1. INTRODUCTION

1.1 The Critical Ecosystem Partnership Fund

The Critical Ecosystem Partnership Fund (CEPF) is a collaborative funding initiative of the l'Agence Française de Développement (AFD), Conservation International (CI), the European Union (EU), the Global Environment Facility (GEF), the Government of Japan, the John D. and Catherine T. MacArthur Foundation, and the World Bank. Their shared interest and objective is the conservation of biodiversity hotspots – Earth's most biologically rich yet threatened areas.

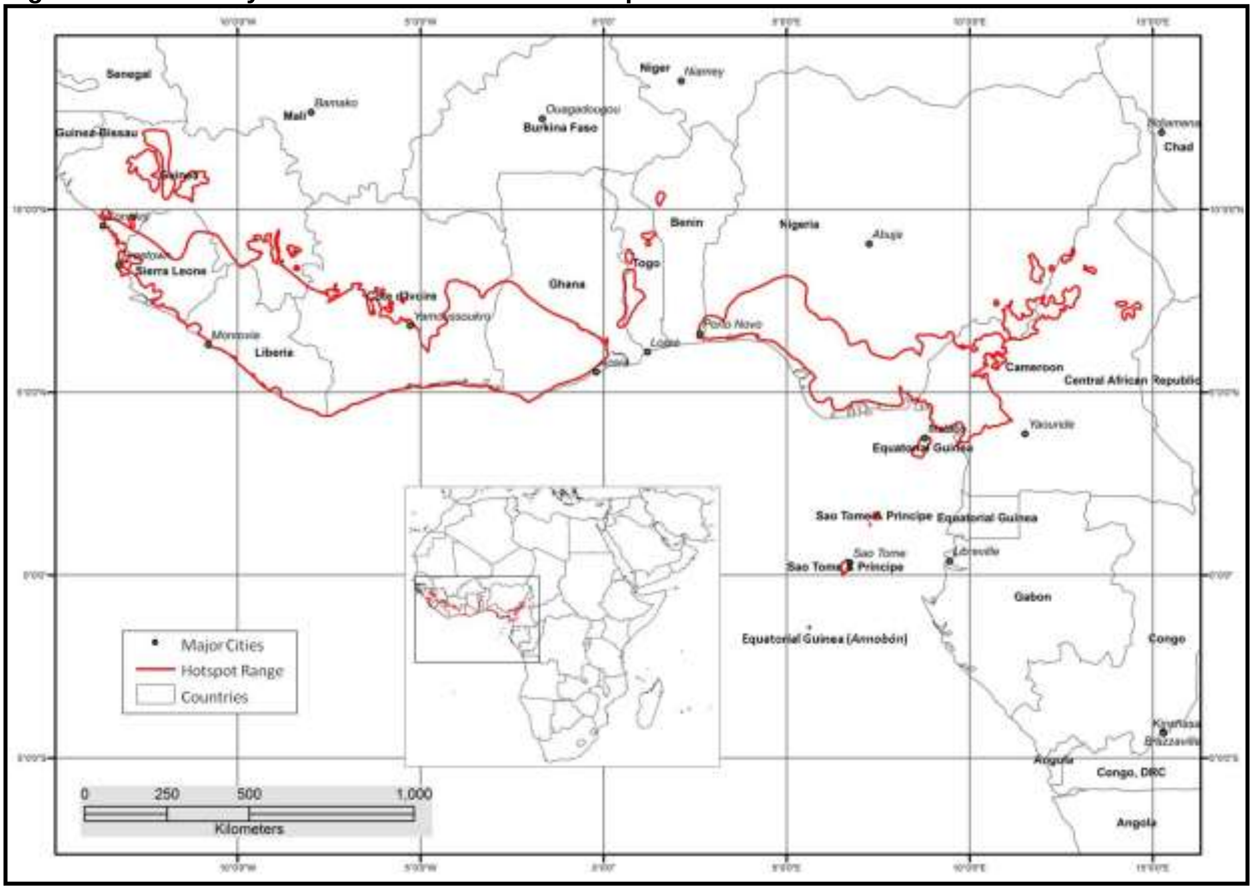
CEPF differs from most other funding agencies in two main ways. Firstly, its focus is on biological, rather than political, boundaries and units. This allows CEPF to support strategies that are expected to be more effective with a regional, rather than national, approach, including actions and alliances that span the boundaries of one or more countries or territories. Secondly, CEPF's focus is on civil society organizations (CSOs), including community-based organizations, academic and research institutions, non-governmental organizations (NGOs), and private sector bodies and companies. Specifically, by encouraging and facilitating civil society participation in nature conservation, and by aiding collaborations and alliances among groups, it is envisaged that a more participatory approach to solving local challenges will emerge. By engaging and supporting such groups, it is hoped that new and innovative ideas and solutions to local challenges will be developed and applied, for the benefit of stakeholders, both locally and elsewhere.

1.2 The Guinean Forests of West Africa Biodiversity Hotspot

The Guinean Forests of West Africa Biodiversity Hotspot (hereafter, for brevity, the Guinean Forests Hotspot), as defined by Mittermeier *et al.* (2004), extends across the southern part of West Africa and into Central Africa north of the Congo Wilderness Area (Figure 1.1). The hotspot covers 621,705 km^2, and can be divided into two subregions. The first subregion, referred to as the 'Upper Guinean Forests', stretches from Guinea in the west, through Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo and, marginally, into Benin. The second subregion, the 'Lower Guinean Forests', covers much of southern Nigeria, extends into southwestern Cameroon, and also includes São Tomé and Príncipe and the offshore islands of Equatorial Guinea. The Guinean Forests are one of eight biodiversity hotspots in Africa and Madagascar.

The Guinean Forests support impressive levels of biodiversity, having high levels of species richness and endemism. In terms of plants, approximately 9,000 species of vascular plant are believed to occur in the hotspot, including 1,800 endemic species (Mittermeier *et al.* 1998, 2004). The hotspot also supports an exceptional diversity of other terrestrial species. There are 416 mammal species (representing nearly a quarter of the mammals native to continental Africa), 917 bird species, 107 reptile species and 269 amphibian species within the hotspot boundary (Mittermeier *et al.* 2004; updated through analysis of Red List data). Of these species, 65 mammals, 48 birds, 20 reptiles and 118 amphibians are thought to be endemic to the hotspot. The hotspot is among the world's top priorities for primate conservation, with five Critically Endangered and 21 Endangered species (Oates *et al.* 2011, IUCN 2015a).

Figure 1.1 Boundary of the Guinean Forests Hotspot



Ninety-two percent of the hotspot's primates are endemic (Mittermeier *et al.* 2004). Freshwater habitats of the hotspot are equally rich, and the diversity and endemism of freshwater taxa such as crabs, fish, mollusks, odonates, plants and shrimps is believed to be particularly high. For example, around one-third of the freshwater fishes found in the hotspot are considered endemic (Paugy *et al.* 2003).

In addition to their biological richness, a number of ongoing threats to biodiversity in the Guinean Forests have resulted in the loss of more than 85 percent of the native vegetation cover, and qualify the region as a hotspot (Mittermeier *et al.* 2004). Major threats include agricultural expansion to provide for the needs of an expanding population in rural and urban areas, unsustainable logging and fishing, hunting and trade of bushmeat, industrial and artisanal mining, industrial development, climate change and pollution, among numerous others. Many of the threats to biodiversity occurring in the region are linked, either directly or indirectly, to a high incidence of poverty, political instability and/or civil conflict.

1.3 Previous CEPF Investment in the Hotspot

In September 2012, the CEPF Donor Council selected the Guinean Forests Hotspot for profiling and future investment. This was intended to be a full reinvestment, following an initial investment and subsequent consolidation phase between 2001 and 2011, during which CEPF provided a total of USD 8.3 million in support to conservation projects in the Upper Guinean Forests subregion. The current ecosystem profile builds on the results achieved and lessons learned from these earlier investments, as outlined below.

During the first full investment period, from 2001 to 2006, CEPF's investment niche focused on promoting connectivity in a broad sense, seeking not only to promote ecological connectivity but also to promote improved coordination from a political, social, and administrative perspective. CEPF adopted this niche in response to the region's emergence from years of civil war, which created a great deal of political and administrative fragmentation in the governance of its natural resources. Civil conflict continued to challenge conservation efforts, even during CEPF grant making. CEPF recognized that a successful conservation program required skilled civil society groups, which were lacking at the time. In response, the initial five-year investment phase focused on several priorities: providing NGOs and private organizations with the capacity to manage biodiversity conservation; strategic funding for strengthening institutional capacity, biodiversity monitoring and public awareness building; and the launch of a small grants fund.

Over the first five-year investment period, grantees achieved several important milestones:

- Twenty-five national and international NGOs and private sector partners built their capacities in a variety of technical and geographic areas, from organizational administration and project management, to the generation and use of biological information and data for decision making.
- Networks, such as the Environmental Forum for Action in Sierra Leone and the BirdLife West Africa partnership, were established and/or strengthened to foster cooperation and coordination. These networks served as avenues for communication, collaboration, and learning, and generated the desire for a regional conservation vision.
- A total of 186,268 hectares was afforded improved protection, including Liberia's Nimba Nature Reserve, which is contiguous with a World Heritage site in Guinea and Côte d'Ivoire. Sapo National Park in Liberia was expanded, while the government of Ghana upgraded protection of a 100,000 hectare forest reserve. Furthermore, grantees helped establish a new, coherent legal framework for forest conservation in Liberia. Management of priority sites improved in Liberia, Sierra Leone, Ghana, Togo, and Côte d'Ivoire.
- Baseline biological data collection led to a consensus-based prioritization of conservation outcomes that continues to be used to this day, and which forms the basis for the conservation outcomes defined in the current ecosystem profile. CEPF-supported rapid biological assessments in Guinea, Liberia, Côte d'Ivoire and Ghana stimulated interest from civil society and governments in new sites critical for conservation.
- More than 140 communities were exposed to conservation projects at multiple levels, from project design, implementation, and results monitoring. CEPF projects involved local communities in all focal countries targeted in the first phase.

At the end of the first funding phase, CEPF's donors and Secretariat, as well as stakeholders in the Upper Guinean Forests recognized that further CEPF investment was warranted due to several factors: the sustainability of CEPF-funded initiatives remained fragile; communities still needed support to strengthen the linkages between livelihoods generation and conservation; and capacity limitations within government agencies and civil society groups continued to stymie the achievement of conservation outcomes. As a result of these factors, CEPF donors approved a three-year consolidation phase from 2008 to 2011. Three investment priorities were targeted over this period: (i) support to promote financial sustainability of CEPF initiatives; (ii) strengthening of the linkages between livelihoods generation and community participation in the conservation agenda through a small-grants program; and (iii) building capacity of local actors for conservation. The consolidation phase limited site-based investment to priority areas in Liberia and Sierra Leone, while continuing to foster capacity building across the subregion.

During the consolidation phase, CEPF grantees achieved several important results:

- Capacity-building activities bore fruit for community and local civil society groups across a variety of sites. For example, Sierra Leone's Environmental Foundation for Africa (EFA) emerged as a conservation leader in West Africa, growing with more staff, programs, and donors. EFA founded and chaired the Environmental Forum for Action, a network of 14 'green actors' across Sierra Leone, which was launched with a CEPF small grant. EFA also opened the Biodiversity and Renewable Energy Learning Center in a forest preserve near Freetown, which serves as a place for learning exchange for practitioners from throughout the region.
- CEPF grantees helped to lay the foundation for long-term funding through several pilot projects. For example, the government of Sierra Leone declared Gola Forest Reserve a national park in preparation for what subsequently became West Africa's first Reduction of Emissions from Deforestation and Forest Degradation (REDD+) project.
- In Liberia, Arcelor Mittal, an iron ore mining company, entered into West Africa's first mining offset project to provide sustainable conservation funding and generate income for local communities. The initiative funded conservation agreements developed by CI's Conservation Stewards Program, whereby local communities agreed to a five-year benefit package to offset foregone access to resources within East Nimba Nature Reserve. The benefit packaged included job training to convert hunters into ecoguards, funding to establish household piggeries, technical support to improve rice production and skills training for community health workers.

CEPF's earlier investments provided an important foundation and important lessons upon which to launch a new investment phase in the hotspot. The main lessons learned are summarized below:

- Emerging NGOs need to start small. They require oversight and capacity building in addition to just money, and they benefit from sharing experience with others.
- Some capacity building approaches appear to work better than others. For instance, mentoring of a small organization by a larger, longer established one seems to be more effective than professional training courses. Nevertheless, retaining trained staff is a major challenge for smaller CSOs, as they tend to leave to take up jobs that offer higher or more reliable salaries.
- Local groups have taken the initiative to form partnerships and networks, for example the Environmental Forum for Action in Sierra Leone. Such collaborations are integral to avoiding duplication of effort and maximizing conservation results.

- CEPF investments in environmental education and outreach have been innovative and unusual, in an effort to get beyond conventional efforts, which have not proven successful (but continue to be used). More innovative communication strategies, featuring the use of film, drama, music and hands-on experience appear to have been more effective at generating enthusiasm and awareness.
- Community participation needs to be encouraged at all stages of the design and implementation of conservation interventions, to ensure they are locally owned.
- Sustaining community motivation to support conservation goals beyond the end of projects was identified as a challenge by several grantees, especially where financial incentives are used.
- Although CEPF investments have been instrumental in generating biodiversity data, they fell short of setting up a region-wide biodiversity monitoring system, as originally planned. One lesson that can be drawn from this is the importance of setting feasible objectives that are well founded in an analysis of the capacity of civil society in the region.
- Corridor creation in West Africa is complex and challenging, and requires substantial incorporation of livelihood components. Poverty is a constant obstacle to conservation success, and CEPF's projects that have included alternative income generation components have often yielded significant results.
- There is a great need for a range of grant sizes, to engage partners of differing capacities. Small grants can be particularly useful for engaging the many smaller CSOs in the hotspot that lack the capacity to handle larger amounts of funding.

Above all, the earlier investments by CEPF in the Upper Guinean Forests demonstrated that, with appropriate support and guided by a common plan of action, civil society groups are able to contribute meaningfully to conservation efforts in West Africa. Many of the CSOs in the Upper Guinean Forests that actively participated in the ecosystem profiling process were very small organizations at the start of the first investment phase, suggesting that investing in small local NGOs has results, at least in a significant proportion of cases. There is, nevertheless, a need for a longer-term engagement by CEPF and other funders, because increases in capacity and on-the-ground conservation results require considerable time to be achieved and secured.

In light of this, CEPF's Donor Council directed the CEPF Secretariat to develop a shared strategy for a new phase of investment in the Guinean Forests through empowering and engaging civil society organizations active in conservation. Although the primary purpose of this document - the ecosystem profile - is to provide a strategy for CEPF investment in the hotspot, it is also designed for use by other donors, government agencies, civil society organizations and private sector groups. Coordinated efforts among multiple institutions are required to confront the challenges facing biodiversity, ecosystem services and communities in the region today.

1.4 Development of the Ecosystem Profile

CEPF commissioned the preparation of this ecosystem profile to guide its planned reinvestment in the hotspot. The profile provides an analysis of the current situation across the hotspot, and which frames a detailed strategy for CEPF investment over a five-year period, between 2016 and 2021. The profile presents an overview of the hotspot, dealing with, in turn, biological and ecological importance (Chapter 3), targets for conservation (Chapter 4), socioeconomic, policy and civil society contexts (Chapters 5, 6 and 7), threats to biodiversity (Chapter 8) including climate change (Chapter 9), and patterns in conservation investment (Chapter 10). This situational analysis informs the definition of a niche for CEPF investment (Chapter 11), an investment strategy (Chapter 12) and a plan for sustaining results beyond the end of the investment phase (Chapter 13).

In addition to using existing datasets and reports, including from the earlier ecosystem profile for the Upper Guinean Forests subregion (CEPF 2000), the information contained in this profile has been gathered through a participatory process, involving consultations with a range of governmental and non-governmental stakeholders in the region (see Chapter 2). The reasoning behind such a participatory approach is the desire to develop a shared strategy from the outset; one that accounts for the needs and ongoing activities of the region's stakeholders, and allows other donors and programs to complement CEPF investments.

The release of this profile will be followed by a multi-year period of implementation through grant-making to CSOs, which will be guided by a CEPF Regional Implementation Team (RIT). CSOs will be asked to submit proposals for activities that are in line with the strategic directions and investment priorities identified through the profiling process (Table 12.3).

2. BACKGROUND

This chapter describes the process used to prepare this ecosystem profile, including summary information on all partners involved. The profiling process entailed a rapid assessment and evaluation of the biodiversity values of the hotspot (at species, site and corridor scales) and the causes of biodiversity loss and their root causes, coupled with the compilation of an inventory of current conservation and development investments in the region. The ecosystem profile was prepared by a consortium consisting of the West and Central Africa Programme of the International Union for Conservation of Nature (IUCN-PACO), the Global Species Programme of the International Union for Conservation of Nature (IUCN-GSP) and the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC), with technical contributions from BirdLife International, CI and other partners, including independent consultants with extensive expertise in the region.

The profiling process began with the organization of an advisory group meeting in Accra, Ghana (December 10-12, 2013), followed by stakeholder consultation meetings in Lomé, Togo (February 17-18, 2014) and Douala, Cameroon (February 24-25, 2014). However, the outbreak of the Ebola virus in March 2014, which affected four of the 11 countries in the hotspot (Guinea, Liberia, Nigeria and Sierra Leone) meant that travel and meetings around the region were severely restricted, requiring the postponement of some the planned consultation activities, and replacement of others by remote consultations. Following the lifting of travel restrictions introduced during the Ebola outbreak, the stakeholder consultation process was concluded with two final stakeholder workshops, in Monrovia, Liberia (August 27-28, 2015) and Limbé, Cameroon (September 2-3, 2015), and a consultation with members of the BirdLife International Africa Partnership in Akosombo, Ghana (October 11-13, 2015).

The main activities of the profiling process were:

i. Defining the conservation outcomes for the Guinean Forests Hotspot at species, site and corridor scales;
ii. Analyzing the socioeconomic, policy and civil society context, and assessing the relevant pressures and threats to the biological values of the region;
iii. Identifying current conservation investments in the hotspot by donors, NGOs and governments;
iv. Consulting a wide range of national and international stakeholders with knowledge of the hotspot in order to gather and validate information and to assist with analysis; and
v. Defining CEPF's niche and investment strategy for the hotspot.

The combined expertise found within IUCN-PACO, IUCN-GSP and UNEP-WCMC provided the consortium with an in-depth understanding of the methodology for identification of Key Biodiversity Areas (KBAs; which provide the main geographical lens for CEPF investment), including firsthand experience of its application in other CEPF hotspot profiling exercises.

As CI had already completed much work on defining terrestrial KBA and conservation corridors in the Upper Guinean Forests subregion during the previous investment phase (see Chapter 4), much of the focus of the current profiling process was on:

i. Refining existing terrestrial KBAs;
ii. Identifying terrestrial KBAs in the Lower Guinean Forests subregion; and
iii. Identifying freshwater KBAs across the whole hotspot, as these were not explicitly considered during the profiling process for the first phase of CEPF investment.

The process involved synthesizing and analyzing existing biological and thematic information, as well as undertaking a participatory approach to verifying the profile structure, contents and overall strategy. This verification involved major stakeholders in the region, and especially representatives from NGOs, research institutions, the private sector and governments. The aim was to gather relevant current information on context and threats, to reach consensus on conservation priorities, and to ensure that stakeholders were part of the process and that they had ownership of the strategy.

The profiling process also capitalized on priority-setting work that has already taken place in a number of the countries covered by the hotspot, including the development of National Biodiversity Strategies and Action Plans (all hotspot countries), national biodiversity strategies gap analyses (Cameroon, Ghana, and Nigeria) and National Adaptation Programmes of Action (Benin, Guinea, Liberia, São Tomé and Príncipe, Sierra Leone and Togo).

2.1 Consultation Process

The profile development process began with an electronic review of literature related to the Guinean Forests, in particular the earlier work carried out by CEPF in the Upper Guinean Forests subregion. This was followed by the invitation of representatives of major stakeholder groups to participate at consultation workshops, with the intension of gathering inputs for the development of the profile. Four different processes were employed:

i. Meeting of an Advisory Group at the onset of the prioritization process;
ii. Three subregional stakeholders consultation workshops for initial data collection and agreement on criteria for analysis;
iii. Remote, questionnaire-based consultations; and
iv. Final stakeholder consultation workshops at the end of the process.

Other methods included review of electronic documents collated from online sources, and outreach to key stakeholders by telephone, Skype and emails. These methods were very important, especially to fill gaps in information obtained from the stakeholder consultations.

2.1.1 Advisory Group

A 23-member Advisory Group comprising of representatives of leading civil society groups, GEF focal points, international and regionally-based individuals well versed in conservation issues of the region, and donors from the 11 countries was established. This group had the mandate to advise on the profiling process, as well as to contribute to the final profile, depending on individual expertise. The Advisory Group members were selected based on their past and ongoing experiences, with a view to achieving a balance of interest across countries, taxonomic groups, etc. This group met in Accra, Ghana in December, 2013, and this meeting was also used as an opportunity to officially launch the profiling exercise. Although 50 individuals were invited to serve on the Advisory Group, only 23 were able to make it to the meeting due to other engagements. They discussed and validated plans for elaborating the ecosystem profile, notably the plans for in-country consultations, and agreed to: raise awareness about the process in their respective countries and networks; provide data or suggestions of experts for definition of conservation outcomes; advise the profiling team on policies and legislation related to conservation; and review drafts of the profile. The Advisory Group formulated the following recommendations: facilitate capacity-building, notably on how to showcase results of the project and what needs to be done; build the capacity of NGOs, communities and government to contribute to the profiling process and implement of the investment strategy that emerges; ensure that that the strategy is holistic and not just focused on the forestry sector but also on other sectors, including agriculture, tourism and mining.

2.1.2 Initial Consultation Workshops

The participatory consultation and verification process, which is important for ensuring consensus and buy-in to the profiling exercise, was carried out through three separate stakeholder consultations, with the overall objective of developing a strategic investment program for the conservation and sustainable management of the Guinean Forests ecosystems. These workshops gave the profiling team opportunities to gather inputs on draft outcomes and to obtain additional baseline data, useful in defining the investment strategy for the hotspot, as well as information on current investments in the hotspot.

The three initial consultation workshops were as follows:

i. **Accra, Ghana (December 11-12, 2013).** This workshop targeted the hotspot's Anglophone countries (Ghana, Liberia, Nigeria and Sierra Leone). It was immediately preceded by the Advisory Group meeting, some of whose members participated in this workshop.
ii. **Lomé, Togo (February 17-18, 2014).** This workshop was aimed at Francophone countries in the Upper Guinean Forests subregion (Benin, Guinea, Côte d'Ivoire and Togo).
iii. **Douala, Cameroon (February 24-25, 2014).** This workshop was aimed at the countries of the Lower Guinean Forests subregion (Cameroon, Equatorial Guinea and São Tomé and Príncipe) except for Nigeria, which was covered by the Accra workshop.

At each of the stakeholder consultation workshops, the profiling team explained the process and invited the assistance of stakeholders for identifying conservation outcomes. Participants were invited to provide contextual information on biodiversity, threats, current investments, civil society and policies in their countries, through completion of a questionnaire. Participants' views were sought on thematic priorities for CEPF investments, which later informed the scope of the investment strategy.

2.1.3 Remote Stakeholder Consultations

A second series of workshops were planned for September 2014, with a view to collating specific information on conservation outcomes. Unfortunately, the outbreak of the Ebola virus across many of the hotspot's countries, and the subsequent international flight restrictions, rendered these workshops logistically impossible. It was, therefore, decided to undertake this stage of the consultation through a remote, questionnaire-based process. More than 90 experts from across the 11 hotspot countries and beyond completed questionnaires with information on individual sites and corridors, related to management capacity, funding status, provision of ecosystem services, and recommendations for thematic investment priorities. Of these 67 completed and returned the questionnaires, providing a rich source of information to inform the identification and prioritization of KBAs. To facilitate this process, three small meetings were held, with the aim of completing these questionnaires in a group environment. The first was held in Calabar, Nigeria (September 19, 2014) by Wildlife Conservation Society (WCS)-Nigeria Program, The second was held in Monrovia, Liberia (September 30 and October 1, 2014) by the Rural Integrated Centre for Community Empowerment (RICCE) and Farmers Associated to Conserve the Environment (FACE). The third was held in Freetown, Sierra Leone by the Conservation Society of Sierra Leone (October 3, 2014).

2.1.4 Final Consultation Workshops

To conclude the consultation process, two final stakeholder workshops were held as follows:

i. **Monrovia, Liberia (August 27-28, 2015)** with 20 senior stakeholders representing Guinea, Sierra-Leone, Liberia, Côte d'Ivoire and Ghana.
ii. **Limbe, Cameroon (September 2-3, 2015)** with 31 senior stakeholders representing Nigeria, Cameroon, São Tomé and Princípe and Equatorial Guinea.

Each workshop had the following objectives:

i. Address information gaps in relation to the civil society context (Chapter 7) and analysis of conservation funding (Chapter 10).
ii. Collect stakeholders' inputs and comments on the other chapters making up the situational analysis.
iii. Reach consensus on the CEPF investment niche (Chapter 11) and strategy (Chapter 12).
iv. Reach a consensus on priority sites for CEPF investment.

The two workshops were successful at reaching broad consensus among participants regarding the CEPF investment strategy for the hotspot, and there was remarkable convergence between the two subregions in this regard. The workshops also enabled a focusing of the georgraphic lens for CEPF investment, through selection of priority sites from a shortlist prepared through an analysis conducted earlier in the profiling process.

The final consultation workshops were complemented by consultations with local NGO partners of BirdLife International in West Africa during October 11-13, 2015. This ensured that inputs were captured from some of the most well established local conservation groups in the hotspot, who were unable to participate in the earlier workshops.

Table 2.1 shows the various consultation workshops held and the number of participants at each.

Table 2.1 Stakeholder Consultation Workshops Held in the Guinean Hotspot

Workshop	Location Held	Date of workshop	No. of participants
Advisory Group Meeting	Accra, Ghana	Dec 10, 2013	28
Initial Consultation Workshop for Anglophone West Africa	Accra, Ghana	Dec 11-12, 2013	28
Initial Consultation Workshop for Francophone West Africa	Lomé, Togo	Feb 17-18, 2014	25
Initial Consultation Workshop for the Lower Guinea Forests Subregion	Douala, Cameroon	Feb 24-25, 2014	23
National Consultation for Nigeria	Calabar, Nigeria	Sep 19, 2014	12
National Consultation for Liberia	Monrovia, Liberia	Sep 30 - Oct. 01, 2014	21
National Consultation for Sierra Leone	Freetown, Sierra Leone	Oct 3, 2014	3
Final Consultation Workshop for the Upper Guinean Forests	Monrovia, Liberia	Aug 27-28, 2015	20
Final Consultation Workshop for the Lower Guinean Forests	Limbé, Cameroon	Sep 2-3, 2015	31
Final Consultation with local NGOs from the BirdLife International Africa Partnership	Akosombo, Ghana	Oct 11-13, 2015	20

3. BIOLOGICAL AND ECOLOGICAL IMPORTANCE OF THE GUINEAN FORESTS HOTSPOT

3.1 Introduction

The Guinean Forests Hotspot supports impressive levels of biodiversity, including numerous endemic species, making it a conservation priority at the global scale. The hotspot is ranked among the world's foremost regions for mammalian diversity. Nearly one quarter of the mammal species native to continental Africa are represented within the hotspot. Notable threatened species in the Lower Guinean Forests subregion of the hotspot include western gorilla (*Gorilla gorilla*) and drill (*Mandrillus leucophaeus*), while the Upper Guinean Forest subregion supports notable endemics, such as the pygmy hippopotamus (*Choeropsis liberiensis*) and several species of forest duikers, such as Jentink's Duiker (*Cephalophus jentinki*). The hotspot is one of the top global priorities for primate conservation due to both high levels of endemism and threat: 92 percent of the hotspot's 30 species of primate are endemic, and almost all of these are assessed as threatened on the IUCN Red List.

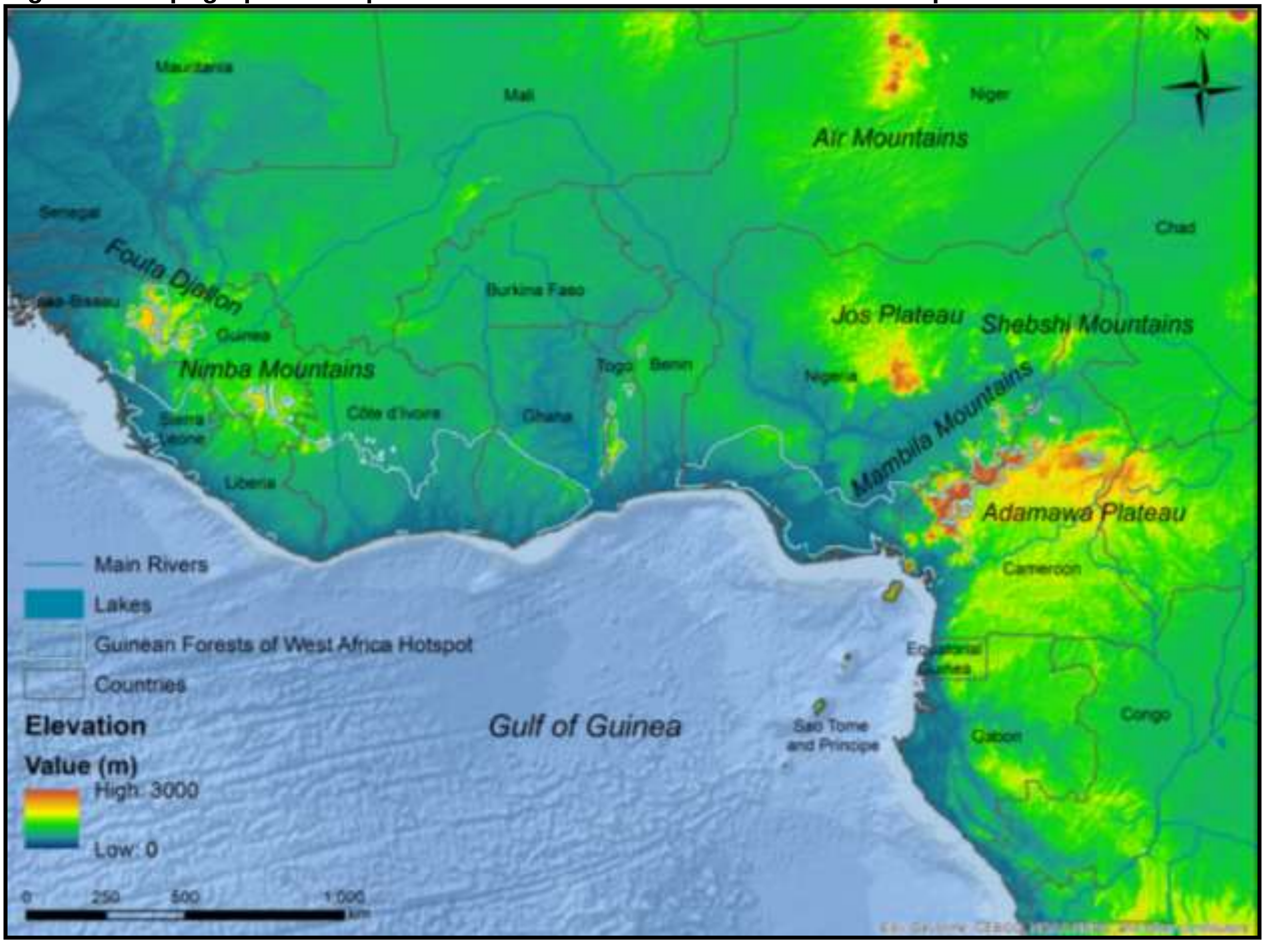
The hotspot contains many other ecological features that render it globally unique. The Niger Delta swamp forests, for instance, are the second largest swamp forest on the continent, while the Central African Mangroves are the largest mangrove stands in Africa and the third largest in the world. The hotspot's offshore volcanic islands support notably high levels of endemism, particularly for their size. One of the largest rivers in West Africa, the Volta, and the delta of the longest and largest river in West Africa, the Niger, occur within the hotspot boundary. The Western Equatorial Crater Lakes ecoregion is among several that are listed as globally outstanding.

This chapter describes the geographical, geological, climatological, biogeographical, biological and ecological importance of the Guinean Forests of West Africa Hotspot. It also outlines the importance of the hotspot in terms of the ecosystem services it provides to its human population.

3.2 Geography and Geology

Situated in West Africa and northwestern Central Africa, and including several oceanic islands, the Guinean Forests Hotspot is a topographically subdued region with few areas of higher ground (Figure 3.1). The main mountain ranges are the Fouta Djallon Massif, Nimba Mountains, Jos Plateau, Mambila Mountains (named here as Cameroon-Nigeria Mountains) and the Adamawa Plateau. The Cameroon-Nigeria Mountains are particularly noteworthy as they contain Mount Cameroon, a 4,040 m active volcano, in addition to other tall, dormant volcanoes, such as Mount Oku (3,011 m) and Mount Kupé (2,064 m). Mount Cameroon is the highest formation in this chain and is the only active volcano in the hotspot, with seven eruptions since 1990 (Cronin *et al*. 2014).

Figure 3.1 Topographical Map of the Guinean Forests of West Africa Hotspot



Source: ARC GIS standard data layers

The hotspot boundary itself is defined, to a large extent, by the habitats occurring within it, in particular by the presence of forested or formerly forested areas. As such, while the hotspot is difficult to characterize through political boundaries, it lends itself more readily to description through biogeographical delineations. This chapter makes reference to terrestrial ecoregions, as described by Burgess *et al.* (2004), which follow the hotspot boundaries, as well as freshwater and marine ecoregions, as appropriate.

The hotspot is divided unequally among countries, and, similarly, the proportion of each country within the hotspot boundary varies greatly. For example, Côte d'Ivoire contains the largest proportion of the hotspot (24.1 percent), while Benin contains the lowest proportion (0.2 percent). São Tomé and Príncipe, and Liberia are the countries with the greatest proportions of their total area considered part of the hotspot (100 percent and 98.5 percent, respectively), while Benin is again the lowest (1.2 percent). These figures are summarized in Table 3.1, and it is important to be aware of these values when reading the later chapters of this profile, particularly Chapters 4 and 5, where much of the information is presented at the country level, as data for the portion of each country within the hotspot was generally not available.

Table 3.1 Total Area and Proportion of the Hotspot in Each Country

Country	Total area (km^2)	Area of overlap with Guinean Forests Hotspot (km^2)	Percentage of hotspot in each country	Percentage of country in hotspot
Benin	117,650	1,462	0.2	1.2
Cameroon	469,784	64,272	10.3	13.7
Côte d'Ivoire	325,990	150,300	24.1	46.1
Equatorial Guinea	28,051	1,965	0.3	7.0
Ghana	242,178	79,902	12.8	33.0
Guinea	249,691	48,488	7.8	19.4
Liberia	96,861	95,376	15.3	98.5
Nigeria	926,744	127,583	20.4	13.8
São Tomé and Príncipe	1,001	1,001	0.2	100.0
Sierra Leone	73,316	47,350	7.6	64.6
Togo	57,637	6,341	1.0	11.0

Geologically, the majority of the hotspot is underlain by ancient Precambrian rocks that have been eroded over many millions of years. These rocks are typically nutrient poor, making the soils derived from them similarly poor in nutrients and often challenging to farm on an annual basis. In many parts of the hotspot, the farming system relies on the clearance of forest and bushland, cultivating the soil for one to two years, and then leaving the area fallow to recover its nutrients for a number of years before farming again.

In some areas, the ancient rocks have been uplifted into mountains and hills, for example in the Fouta Djallon in Guinea, the Loma Hills in Sierra Leone, the Mount Nimba area of northern Liberia, the Togo Hills in Togo, and the Jos Plateau in Nigeria. Along the border between Nigeria and Cameroon is another mountain range that contains both ancient and more recent volcanoes. Historic volcanic activity has led to the formation of the extensive chain of highlands called the Cameroon Volcanic Line, which includes the volcanic islands of Bioko, Príncipe, São Tomé, and Annobón in the Gulf of Guinea, and stretches northeast through Cameroon and beyond the hotspot as far as Lake Chad. Almost all of these are dormant today, although some are still producing quantities of carbon dioxide and other gases from below their crater lakes. These volcanic rocks weather to form much more productive soils, for example on Mount Cameroon.

Within the hotspot, there are also sedimentary deposits associated with river deltas and coastal shelves. In these areas, there are significant deposits of oil and gas, especially associated with the ancient delta of the Niger River in Nigeria.

3.3 Climate

The prevailing climate in the hotspot is tropical and humid, with annual maximum temperatures ranging from around 30 to 36°C. The climate has a significant effect on the biodiversity of the hotspot, permitting a high diversity of species to persist. The cooler end of this temperature range is found near to the coast, and temperatures increase as one moves northwards (Hijmans *et al.* 2005).

The hotspot shows little seasonality in terms of temperature, with maxima and minima remaining similar throughout the year at any given location but differing, rather, in terms of level of precipitation, which is governed by the annual movements of the inter-tropical convergence zone, and results in monsoon conditions (often referred to as the 'rainy season'). The onset and length of the rainy season can be variable but may be broadly described as beginning around March or April in coastal environments (around 5°N), and expanding its coverage (to approx. 10°N) until around June. From July to September the core of the rain-band shifts to around 10°N, where higher rainfall is received, and from September to November the rain-band retreats southward once again (Le Barbé *et al.* 2002). The result of this phenomenon is that more southerly locations experience two peaks in rain throughout the year, while those further north experience only one. As with temperature, the seasonality in rainfall has a major impact on the biodiversity of the region.

Typical annual rainfall near the coast is around 3,000-3,500 mm, and decreases to around 1,500-2,000 mm further inland. Many of the forested areas in the hotspot have an average annual precipitation of around 2,000-2,500 mm inland, rising to nearly 4,000 mm in the coastal areas (Cole 1968; Barbour *et al.* 1982). Certain locations, such as the Number Two River on the Freetown Peninsula in Sierra Leone, receive more than 5,000 mm of precipitation annually. In the Mount Cameroon area, annual rainfall can reach 10,000 mm locally, and gradually declines with increasing elevation, to less than 2,000 mm at the summit of Mount Cameroon. The Guinean Montane Forest ecoregion, the Nigerian Lowland Forest ecoregion and the Cross-Niger Transition Forests ecoregion are relatively less wet regions, with annual precipitation decreasing from 2,000-2,500 mm near the coast to 1,500-2,000 mm further inland.

The difference in rainfall between the relatively dry ecoregions and the wetter ones is significant during the dry season (around December to February). For instance, the Nigerian Lowland Forests receive less than 50 mm of rain during this time, while the Niger Delta Swamp Forests still receive an average monthly mean of 150 mm.

3.4 Biological History

During wetter climatic periods, such as those of the past few thousand years, the Guinean Forests Hotspot would have been covered in large part by tropical rainforest formations, perhaps over as much as 624,000 km^2. However, the forest cover has been reduced to a series of fragments of high forest separated by large areas of agricultural land (often termed farm-bush), and numerous villages and towns. Overall, the hotspot retains approximately 93,047 km^2 of natural vegetation, or roughly 15 percent of its original cover (Mittermeier *et al.* 2004).

Over the past million years or more, the vegetation zones of West Africa have migrated north and south depending on the prevailing climate. Ice ages in the Northern and Southern Hemispheres caused a general drying across Africa, and at the height of these colder glacial periods, forest cover shrank and may have become confined to refugia located in the centers of diversity in the present-day Upper and Lower Guinean Forests subregions. During interglacial periods the forest would have expanded again, as the climate of the region became wetter. This climatic oscillation over periods of thousands of years and the associated expansion and contraction of forest cover is probably the most important contributing factor to the diversity and patterns of the biota seen in the lowland forests.

The mountain chain of Nigeria-Cameroon and the offshore islands, which are all isolated volcanoes, have a different history. Here, evolution and speciation has depended upon isolation on oceanic islands or inland montane areas, with both evolutionarily ancient species and more recently evolved ones found in these islands of habitat. One of the driving forces behind the diversity patterns observed in the hotspot is the wide variety of habitats found in the highland areas. Here, patterns of endemism follow an elevation gradient, with highland areas hosting the largest concentrations of endemics (Cornin *et al*. 2014).

Threats to the Guinean Forests and their biodiversity are inextricably linked to poverty, rapid human population growth, unsustainable mining, fishing practices and logging, as well as political instability and civil conflict (GEF 2010). Studies suggest that around 80 percent of the original forest area is now an agriculture-forest mosaic (Norris *et al.* 2010). Much of the remaining forest is exploited for timber and/or is used for local purposes, such as for construction materials and fuel. A majority of the hotspot's forests show evidence of tens of thousands of years of periodic human habitation, use and re-growth (Lindsell and Klop 2013), meaning that very little of the remaining forest can be regarded as pristine. Nonetheless, inhabitation of the forest does not always result in forest cover decline, as communities sometimes also plant forests, such as in the forest-savanna mosaic at the northern boundary of the hotspot (Fairhead and Leach 1996).

3.5 Biogeographical Zonation

3.5.1 Larger Scale Bioregions

The hotspot represents the Guinean portion of the Guinea-Congolian forests, and comprises two main subregions: the Upper Guinean Forests; and the Lower Guinean Forests. These two subregions are separated by the Dahomey Gap, in Benin and Togo, which is a climatically-induced dry region originating from the late Holocene Epoch. The Dahomey Gap, which currently supports a mixture of farmland, savanna and dry forest, is not considered part of the hotspot.

The Upper Guinean Forests subregion extends from southern Guinea eastward through much of central and southern Sierra Leone, all of Liberia, much of southern Côte d'Ivoire and Ghana. Isolated patches of habitat associated with the Upper Guinean Forests subregion are found in central and southeastern Guinea, where they primarily contain submontane and montane forests (Fouta Djallon and Mount Nimba). Small isolated patches of the hotspot associated with this subregion also occur in western Togo (the Togo Highlands) and extend northward to terminate at one isolated patch in northwestern Benin.

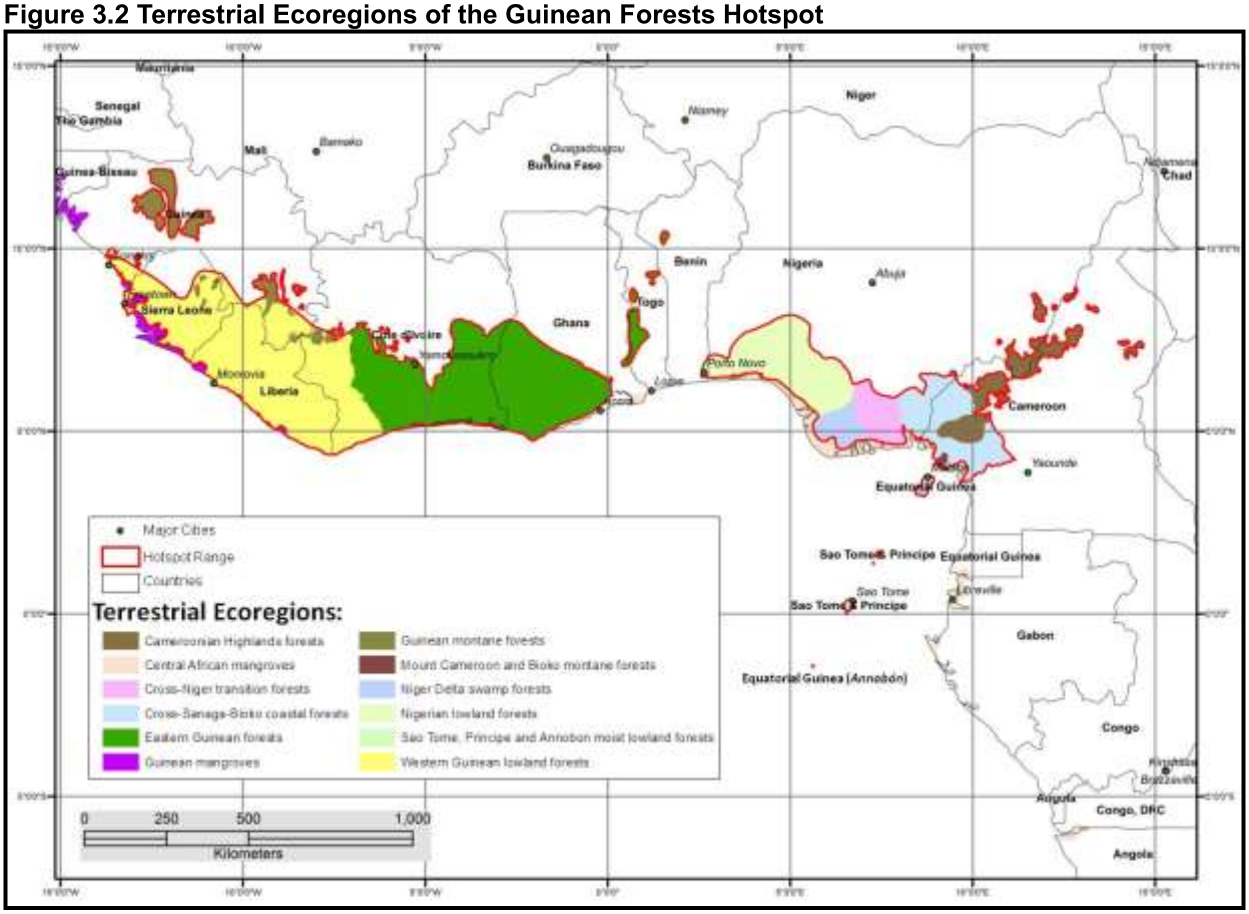
The Lower Guinean Forests subregion extends from western Nigeria to the Sanaga River in southwestern Cameroon. It also includes the islands of Bioko and Annobón (both part of

Equatorial Guinea), as well as the islands of São Tomé and Príncipe. The patterns of biodiversity in the offshore islands are a reflection of the biogeographic history of the region. While Bioko lies on the continental shelf and has been connected to African mainland, Annobón and São Tomé and Príncipe are truly oceanic and have never been connected with each other or with the mainland. Consequently, Bioko supports a much more diverse flora and fauna with relatively low levels of endemism, whereas the furthermost islands have low species richness due to their isolation, but contain exceptionally high rates of endemism at the generic, specific, and subspecific levels. High species richness is also observed in the Cameroon Highlands, and results from a high diversity of habitats found in a restricted geographic area.

3.5.2 Ecoregions

Ecoregions are large units of land or water, which contain distinct assemblages of species, habitats and ecological processes, and whose boundaries attempt to depict the original extent of natural communities before major land-use changes (Burgess *et al.* 2004). They are based mostly on previously proposed biological divisions. The hotspot contains 12 terrestrial, 15 freshwater and four marine ecoregions, which are described in detail in Appendices 1 to 3.

Figure 3.2 Terrestrial Ecoregions of the Guinean Forests Hotspot



Data Source: Olson *et al.* (2001).

Terrestrial Ecoregions

The Guinean Forests Hotspot supports three main forest types: lowland forest; mangrove and swamp forest; and submontane to montane forest. All of these fall into the higher hierarchical grouping of Tropical and Subtropical Moist Broadleaf Forests (Burgess *et al*. 2004). The 12 major terrestrial ecoregions contained within the hotspot are shown in Figure 3.2.

Of the 12 ecoregions occurring within the hotspot, those comprising the greatest proportions of the hotspot overall include the Eastern Guinean Forests and the Western Guinean Lowland Forests, which together comprise the vast majority of the Upper Guinean Forests subregion. In the Lower Guinean Forests subregion, the Nigerian Lowland Forests ecoregion and the Cross-Sanaga-Bioko Coastal Forests ecoregion together make up the greater proportion, followed by the Cameroonian Highland Forests ecoregion. The Guinean Montane Forests, Niger Delta Swamp Forests and Cross-Niger Transition Forests ecoregions comprise smaller, yet significant, proportions of the hotspot, while the Guinean Mangroves, Central African Mangroves, Mount Cameroon and Bioko Montane Forests, and São Tomé, Príncipe and Annobón Moist Lowland Forest ecoregions all have smaller overall areas within the hotspot.

Further information on the biological importance of these ecoregions is presented in Table 3.2, and further details can be found in Appendix 1.

Table 3.2 Biological Importance and Main Threats to the Terrestrial Ecoregions the Hotspot

Ecoregion	Notes
Cameroonian Highlands Forests	Classified as Globally Outstanding, this ecoregion is characterized by high endemism, including: at least 50 species and three families of plants; nearly 40 amphibians; numerous birds (e.g. green longtail (*Urolais epichlora*), white-tailed warbler (*Poliolais lopezi*), Mount Cameroon francolin (*Francolinus camerunensis*), Fernando Po batis (*Batis poensis*) and Bannerman's Turaco (*Tauraco bannermani*); reptiles (e.g. *Chamaeleo montium, C. quadricornis, Hydraethiops laevis, Leptosiaphosi anthinoxantha*); and mammals such as Preuss's monkey (*Cercopithecus preussi*), and northern needle-clawed bushbaby (*Euoticus pallidus*), plus 11 further small mammal species. The ecoregion is also important for primates (e.g., drill, chimpanzee (*Pan troglodytes*) and western gorilla), and African elephant (*Loxodonta africana*). The main threats to this ecoregion are unsustainable exploitation of firewood, overgrazing, fire damage, agricultural encroachment and hunting.

Ecoregion	Notes
Central African Mangroves	Classified as Locally Important, this mangrove ecoregion does not contain any endemic species but it does support several threatened species, and a diverse pelagic fish community. The ecoregion is important for many species that depend on mangroves for parts of their life cycle. The mangroves provide habitat for the soft-skinned turtle (*Trionyx triunguis*) and host at least five species of Endangered and Critically Endangered marine turtles during the summer (of which at least four are known to occur in the hotspot). These mangrove habitats are important for large concentrations of birds that reside in the areas during migration, and also provide spawning and nursery areas for the fisheries in the Gulf of Guinea. The pelagic fish community found here has a high diversity, with 48 species in 38 families. The main threat to the ecoregion is habitat loss due to urbanization, industrialization, agriculture, and timber exploitation. Petroleum exploitation also affects the mangroves due to infrastructure development and risk of oil spills. This mangroves are also threatened by the invasive nipa palm (*Nypa fruticans*; an alien species from Southeast Asia), especially in the Niger Delta and the bakassi area of Cameroon.
Cross-Niger Transition Forests	Classified as Locally Important, this ecoregion harbors species typical of the Upper Guinean Forests subregion to the west and the Cross-Sanaga-Bioko Coastal Forests to the east, and can, therefore, be considered as transitional between the two. The ecoregion displays extremely low rates of endemism for a tropical forest ecoregion, with only two near-endemic species, the Vulnerable Scalter's guenon (*Cercopithecus sclateri*) and crested chameleon (*Chamaeleo cristatus*). The main threat to the ecoregion is habitat loss relating to increasing human population densities, the effects of which date as far back as the ninth century AD. No significant sections of forest remain in the ecoregion. Conversion of forest to agriculture and bushmeat hunting constitutes the main pressures on the ecoregion. This is one of the most densely populated ecoregions in Africa.
Cross-Sanaga-Bioko Coastal Forests	Classified as Globally Outstanding, this ecoregion has very high species richness, including among butterflies, plants and all terrestrial vertebrates. This area is thought to contain the highest numbers of forest-restricted birds and mammals in Africa (Burgess *et al.* 2000). Primates are particularly notable, and include Preuss's red colobus (*Procolobus preussi*), red-eared monkey (*Cercopithecus erythrotis*), crowned guenon (*C. pogonias*), drill, pallid needle-clawed galago (*Euoticus pallidus*), Pennant's red colobus (*Procolobus pennantii*), the Cross River subspecies of western gorilla, and the Nigeria-Cameroon subspecies of chimpanzee (*Pan troglodytes ellioti*). Endemic small mammals include Bibundi bat (*Chalinolo busegeria*) and Cameroonian shrew (*Crocidura picea*). Endemic amphibians include Schneider's banana frog (*Afrixalus schneideri*), Dizangue reed frog (*Hyperolius bopeleti*) and Werner's river frog (*Phrynobatrachus werneri*). Endemic reptiles include forest chameleon (*Chamaeleo camerunensis*) and a species of worm lizard, *Cynisca schaeferi*. The greatest threats to the semi-deciduous forests of this ecoregion are hunting and agricultural conversion, as well as fires associated with traditional agricultural practices. In addition to slash-and-burn agriculture, forests have been lost to commercial logging, and fuelwood collection. Forest losses in Côte d'Ivoire and Ghana have also been driven by forest conversion for cacao and coffee production.

Ecoregion	Notes
Guinean Montane Forests	Classified as Regionally Outstanding. The forests have been classified as the Afromontane archipelago-like regional center of endemism. The diversity and endemism of many parts of this ecoregion are not well known, with the exception of Mount Nimba. Thirty-five endemic plants and 11 paleoendemics have been recorded in the ecoregion. Four mammals found in the ecoregion are either strict endemics or narrowly shared with the surrounding habitats. The Endangered West African subspecies of chimpanzee (*Pan troglodytes verus*) is found in high densities around Mount Loma (Lebbie 2015). The principal threats to this ecoregion are mining for iron ore, anthropogenic fires and deforestation.
Mount Cameroon and Bioko Montane Forests	Classified as Globally Outstanding, this ecoregion falls into the Afromontane archipelago-like regional center of endemism. Exceptional levels of species diversity and endemism are found in both the flora and fauna of this ecoregion. At least 42 plant species and three genera are strictly endemic to Mount Cameroon, and another 50 species are near endemic. Twenty-nine of these near-endemic species are also found on Bioko. Over 370 bird species have been recorded here, including several endemics and two strictly endemic species. Mammals display moderate levels of diversity and endemism. The demand for new agricultural land by an expanding human population, combined with the lack of protected areas, is the major threat to this ecoregion. Areas with lower rainfall are most likely to be converted to agricultural lands. Hunting pressure, due to the demand for bushmeat, is also a threat to this ecoregion.
Niger Delta Swamp Forests	Classified as Locally Important, very little is known about the species composition of this ecoregion, as the first wildlife surveys were only conducted as recently as the late 1980s. Species that were not known from the delta or even from Nigeria as a whole were still being discovered in the 1990s. A subspecies of the Critically Endangered Pennant's red colobus (*P. p. epieni*) is endemic to this ecoregion. The greatest threat to this ecoregion is the growing human population and the associated unsustainable use of natural resources, including the hunting of wild species. The delta lies in between the two most densely populated ecoregions in Africa, both of which now have depleted resources, leading their populations to look to the delta for alternatives. Oil, gas and timber exploration and exploitation also drive habitat destruction in the ecoregion.
Nigerian Lowland Forests	Classified as Bioregionally Outstanding, levels of endemism within this ecoregion are low, despite the biogeographic boundaries created by the Niger River and the Dahomey Gap. The ecoregion contains few strictly endemic plant species, although five strictly endemic animal species are found here. All forests of the ecoregion and the species they support are highly threatened by high and increasing population density in the region. Farming, logging and hunting are the main human activities that threaten the ecoregion.

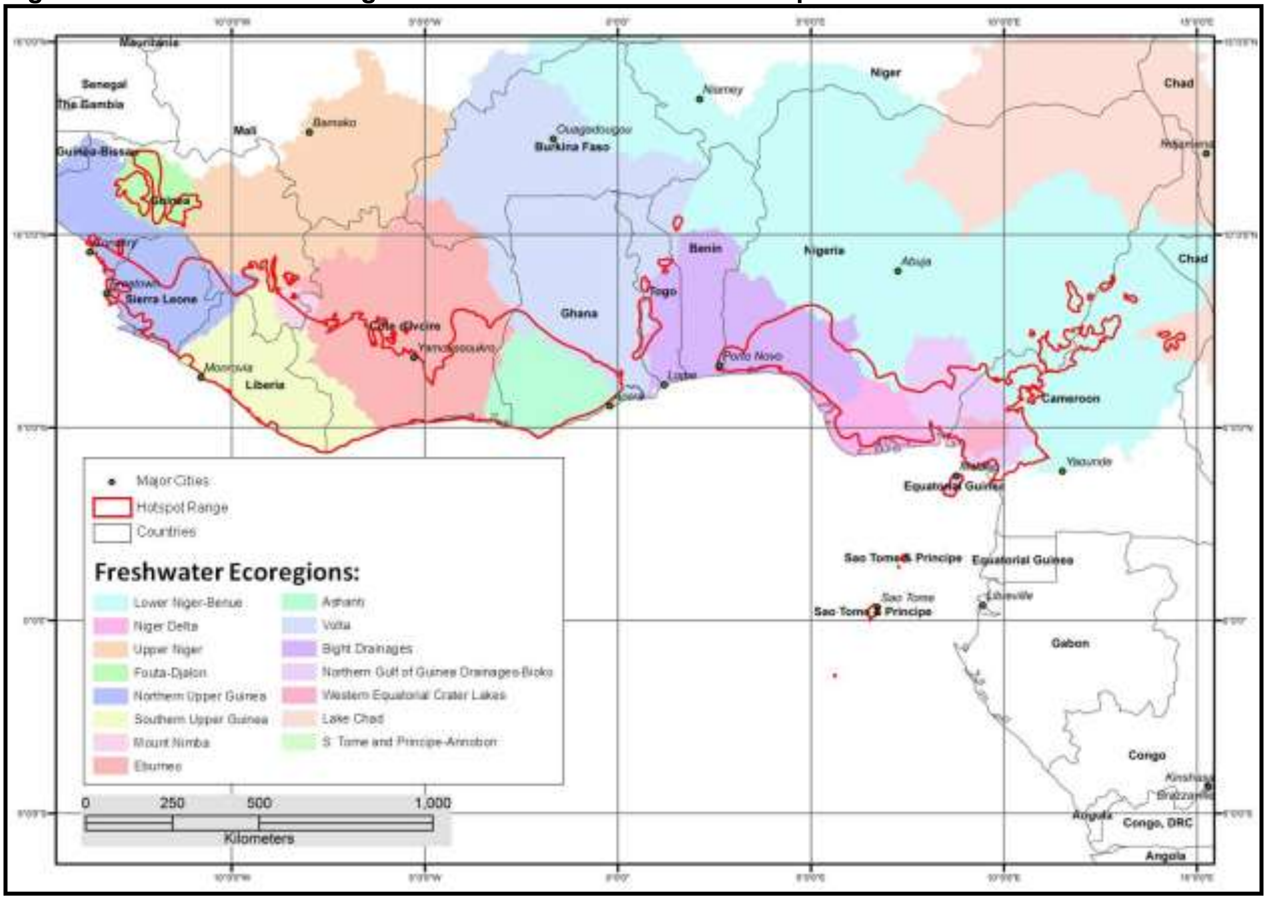
Ecoregion	Notes
São Tomé, Príncipe and Annobón Moist Lowland Forests	Classified as Globally Outstanding, this ecoregion supports exceptionally high levels of endemism at the generic, specific and subspecific levels. Around 37 endemic angiosperm plant species are found on Príncipe, 95 on São Tomé, and 20 on Annobón. Also, São Tomé is known to support 13 endemic bryophytes, one endemic gymnosperm and 10 endemic ferns and lycophytes, while Príncipe is known to support two endemic bryophytes and three endemic ferns and lycophytes. Twenty-eight endemic bird species are found on São Tomé and Príncipe, making these islands highly important for bird conservation. There are at least six mammal species endemic to São Tomé and Príncipe: two shrews and four bats. Eighteen of the 24 reptiles found on the islands are endemic, and rates of endemism above 75 percent are found for terrestrial gastropods on all three islands. The main threats to this ecoregion are the large areas of forest that are being cleared for oil palm, horticultural and cacao plantations. Overexploitation of forest resources and introduced mammal species (e.g. *Cercopithecus mona*, *Rattus* sp., *Mustela nivalis* and *Sus scrofa*) also pose a threat to the natural ecosystems of the islands.
Western Guinean Lowland Forests	Classified as Globally Outstanding, this ecoregion has been classified as part of the Upper-Guinea block of the Guineo-Congollian regional center of endemism. High species richness and endemism are found here. More than 3,000 plant species occur here, of which at least 200 are endemic. There are 15 near endemic mammal species in the ecoregion, as well as larger threatened mammals such as the Endangered West African subspecies chimpanzee. There is high diversity and endemism among herpetofauna of the ecoregion, and the reptile fauna includes three strictly endemic species. The main threats to the ecoregion are the increasing demands for farmland, fuel wood, timber, bushmeat and mineral resources, which all lead to forest loss.

Note: Descriptions of each include indices of biological importance, which use the following categories (ranging from highest to lowest importance): Globally Outstanding; Continentally Outstanding; Regionally Outstanding; Bioregionally Outstanding; Nationally Important; and Locally Important (following Burgess *et al.* 2004).

Freshwater Ecoregions

The general distribution and status of freshwater biodiversity across the hotspot has been described in some detail within the context of the set of freshwater ecoregions delineated for Africa by Thieme *et al.* (2005). The 15 freshwater ecoregions overlapping the hotspot are shown in Figure 3.3. These ecoregions typically fall within the major river basins of the hotspot (shown in Figure 3.4). Further information on the biological importance of these ecoregions is presented in Table 3.3, and a more detailed overview of each can be found in Appendix 2.

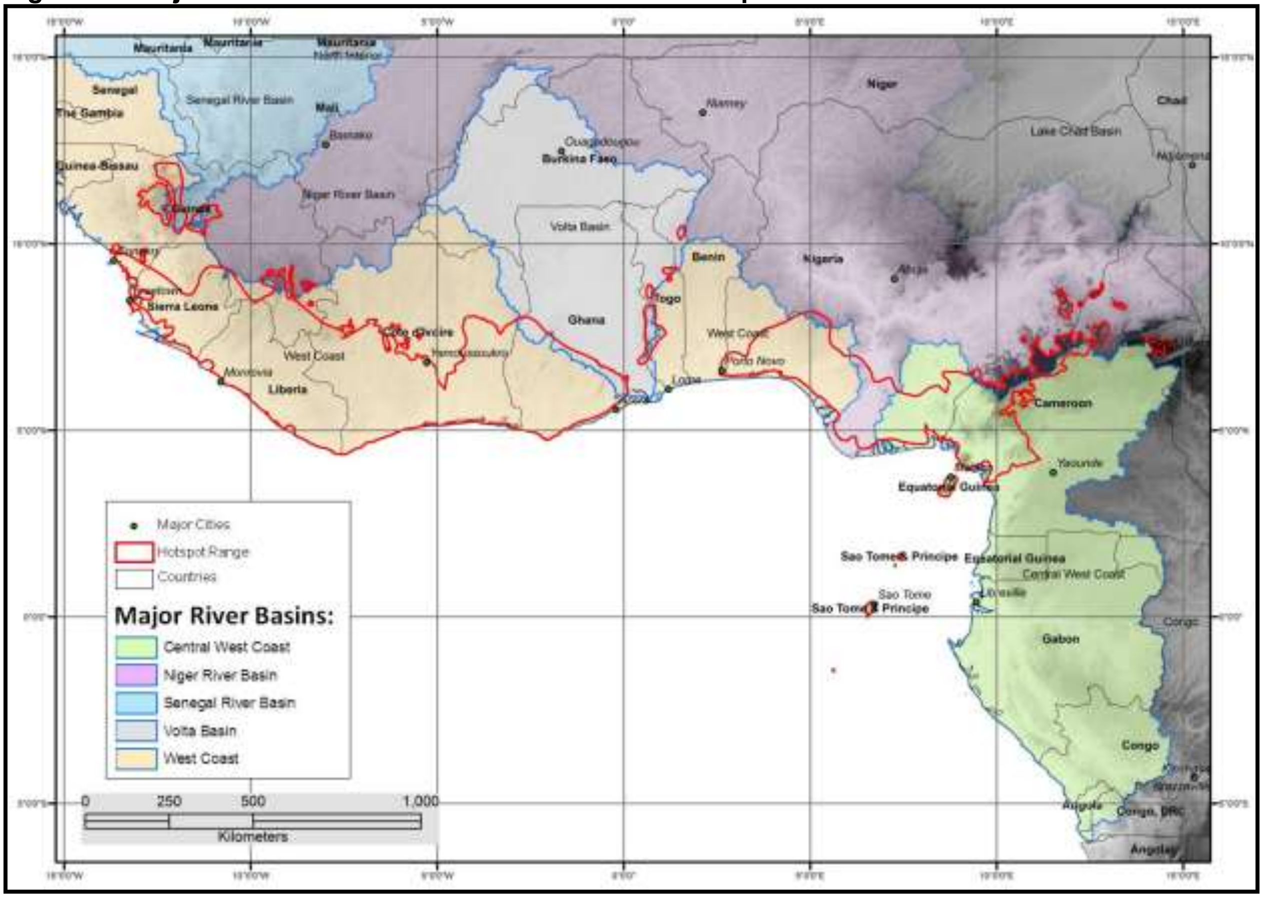
Figure 3.3 Freshwater Ecoregions of the Guinean Forests Hotspot



Source: Abell *et al.* (2008).

Figure 3.4 illustrates the overlap between the hotspot and the major river basins in West Africa. The hotspot is drained by three of the 13 major river basins in Africa: the Niger; the Senegal; and the Volta. The Senegal River basin spans four countries: Guinea; Mali; Mauritania; and Senegal. Its three main tributaries, the Bafing, Bakoye and Faleme, all originate from the Fouta Djallon Massif in Guinea within the hotspot. The Niger River is the longest and largest river in West Africa, and spans 10 countries, including Algeria, Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger and Nigeria. The Niger River originates in the Loma Mountains of Sierra Leone, situated within the hotspot in the Guinea Montane Forests ecoregion, and has numerous tributaries joining it. One of the major tributaries of Niger River is the Benue, which merges with the Niger at Lokoya in Nigeria. The Volta River basin spans six countries: Benin, Burkina Faso, Côte d'Ivoire, Ghana, Togo, and Mali. The area of the hotspot directly west of the Dahomey Gap is constituted by this ecoregion. The three major tributaries of the Volta River are: the White Volta, the Black Volta (both of which originate in Ghana) and the Oti (originating in Burkina Faso), which together drain the plateau in the north, the Atakora Mountains in the east, and several highland areas in the west.

Figure 3.4 Major River Basins of the Guinean Forests Hotspot



Source: ArcGIS 10.0 Data Package.

Additional large rivers draining the countries of the hotspot include the Gambia River, which stems from the Fouta Djallon Massif of Guinea, the Sewa River of Sierra Leone, which has many of its tributaries arising from the Loma Mountains and Tingi Hills, the Cross River which is the main river of southeastern Nigeria, and the Sanaga River in Cameroon.

Table 3.3 Biological Importance and Main Threats to the Major Freshwater Ecoregions of the Hotspot

Ecoregion	Notes
Ashanti	Classified as Bioregionally Outstanding, this ecoregion has around 10 percent of its fish fauna endemic, including several highly restricted-range species. Fourteen percent of the amphibians in the ecoregion are endemic. The ecoregion is also rich in mollusks, and provides important breeding and resting habitats for aquatic birds (Wetlands International 2002). The major threat to this ecoregion is the increasing human presence, which is resulting in the conversion of lands for agriculture and human settlements.

Ecoregion	Notes
Bight Drainages	Classified as Continentally Outstanding, this ecoregion is lower in terms of endemism, although it supports locally high species richness. Six endemic amphibians, six endemic fish and three endemic mollusks are found in the ecoregion. It is also important for several non-endemic, yet threatened (IUCN 2015a) species, including the Vulnerable West African manatee (*Trichechus senegalensis*), the Vulnerable hippopotamus (*Hippopotamus amphibius*) and the Vulnerable West African dwarf crocodile (*Osteolaemus tetraspis*), as well as providing important migratory and feeding habitats for aquatic birds. The major threat to this ecoregion is further deforestation, runoff from agricultural lands, and pollution driven by population increases in the ecoregion.
Eburneo	Classified as Nationally Important, this ecoregion has high richness of aquatic mollusks, with 33 known species, the majority of which are snails, of which four are endemic (and many others near endemic). One hundred and thirty fish species, including 10 endemics, have been recorded in this ecoregion. The brackish lagoons found here support the Vulnerable west African manatee, while the Endangered pygmy hippopotamus lives along the forested streams. The major threat to this ecoregion is the ongoing conversion of forests for agricultural use, and the subsequent pollution from agricultural practices. The loss of connectivity caused by dams, and changes in the riverine hydrology also threaten the ecoregion.
Fouta-Djallon	Classified as Bioregionally Outstanding, this ecoregion is characterized by isolated habitats with waterfalls and rapids, which have restricted the colonization of species downstream and encouraged evolution of species that are unique to these rivers. Sixty fish species are described in the ecoregion, with one quarter of these being endemic species adapted to headwater streams. Nearly all endemic species are cyprinids. The major threat to this ecoregion is traditional slash and burn agriculture, which has led to loss of the majority of the forest cover, affecting freshwater systems (e.g. through erosion and sedimentation). Other threats include dam construction and pollution.
Lower Niger-Benue	Classified as Continentally Outstanding, this ecoregion has a biota typical of the Nilo-Sudanian bioregion. Around 202 fish species adapted to seasonal flooding live within the ecoregion. Of these, 17 are endemic, including the Vulnerable freshwater stingray (*Dasyatis garouaensis*). The west African manatee resides in the Lower Niger and travels upstream in the wet season, as do many fish species. Of the 88 frog species in the ecoregion 16 are likely to be endemic to the surrounding forests, woodlands and wetlands. Many Palearctic migratory birds are hosted by the Niger River, including ducks and geese, storks and herons. The main threats to the ecoregion are dam construction, drought, population growth, habitat conversion for agricultural, and pollution from agriculture and industry.

Ecoregion	Notes
Mount Nimba	Classified as Bioregionally Outstanding, Mount Nimba's high elevation, combined with the presence of rapids and waterfalls, has led to isolation, and high endemism of aquatic species, despite only moderate richness. Endemic aquatic fauna include frogs, fish, one freshwater crab, as well as the Endangered Mount Nimba otter shrew (*Micropotamogale lamottei*). The Near Threatened Cape clawless otter (*Aonyx capensis*) lives in the mountain streams. Species richness is notably high among aquatic invertebrates. Reophytes (which are plants adapted to living in running water) dominate the riparian vegetation. The main threats to the ecoregion are land conversion human habitation and mining. Following the Ivorian political crisis, the Mount Nimba area was subject to massive infiltration and exploitation.
Niger Delta	A rich freshwater fauna is found in the Niger Delta, including five monotypic fish families, which is the highest concentration in the world. Such higher taxonomic endemism warrants the Niger Delta's classification as Globally Outstanding. Twenty of the 150 freshwater fish found in the ecoregion are endemic. The Vulnerable freshwater stingray and the Endangered thorny freshwater stingray (*Urogymnus ukpam*) are found in the delta. Sixty percent of Nigeria's mangrove forests are situated in the Niger Delta. The mangrove forests and freshwater swamp forests provide habitats for aquatic mammals, mollusks, reptiles and amphibians, and are important for numerous waterbirds. The main threats to the Niger Delta are extensive logging for commercial timber, population growth, and access routes created as part of infrastructure development projects.
Northern Gulf of Guinea Drainages- Bioko	Classified as Globally Outstanding, the coastal rivers and streams that feed into the Gulf of Guinea support a rich aquatic fauna. The extensive mangroves of the ecoregion's estuaries are highly productive habitats, and provide nurseries and breeding grounds for crustaceans and fish. More than 200 fish species inhabit the waters of the ecoregion, and 40 of these are considered to be near or strict endemics. Around one-quarter of the approximately 130 water-dependent amphibian species found in the ecoregion are endemic. Twelve of the 48 dragonfly species found in the ecoregion are endemic to it, of which four are endemic to the island of Bioko. Aquatic mammals that inhabit the ecoregion include African clawless otter, African water rat (*Colomys goslingi*), giant otter shrew (*Potamogale velox*), hippopotamus, spot-necked otter (*Lutra maculicollis*) and the Vulnerable West African manatee. The main threats to the ecoregion are changes in habitat due to logging and agriculture. The mangroves of the ecoregion have suffered from high levels of deforestation.

Ecoregion	Notes
Northern Upper Guinea	Classified as Continentally Outstanding, this ecoregion, together with Southern Upper Guinea, Fouta Djallon and Mount Nimba, forms the Upper Guinean bioregion, which has a distinct fish fauna. Around 28 percent of the 160 fish species found in the coastal streams and rivers are endemic. Ten endemic frogs, four endemic freshwater crabs, two endemic dragonflies and five endemic mollusks live within the waters of the ecoregion. Overwintering birds are found on the floodplains. Mangrove forests provide breeding and spawning grounds for many species of fish, insects and shellfish. A large variety of aquatic reptiles and mammals are found within the ecoregion, including all three species of African crocodile, the Vulnerable West African manatee, and the Endangered pygmy hippopotamus. Major threats to the ecoregion are the destruction of mangrove forests, particularly for timber and charcoal, and for oil and gas exploration. This has resulted in the loss of around 50 percent of their area in 40 years. Land-use changes driven by small-scale mining, and rice production also pose a threat.
S. Tomé and Príncipe-Annobón	Classified as Bioregionally Outstanding, this ecoregion has extremely low overall freshwater faunal richness but high levels of endemism among certain taxa. Nine species of amphibian live in the ecoregion, all of which are endemic. Only two species of freshwater fish and three species of freshwater mollusk are found on the islands. The ecoregion also supports the endemic and Critically Endangered Príncipe dropwing dragonfly (*Trithemis nigra*), an endemic freshwater crab (*Potamonautes margaritarius*) and four species of endemic freshwater shrimps (*Atya intermedia*; *A. sulcatipes*; *Macrobrachium zariquieyi* and *M. chevalieri*). The main threat to the ecoregion is the removal of primary forest, which is driven by land privatization.
Southern Upper Guinea	Classified as Bioregionally Outstanding, this ecoregion is characterized by relatively short and partly torrential rivers and streams, which support a highly endemic freshwater fish and crab fauna. Around one fifth of the 151 fish species in the ecoregion are endemic, with particularly high levels of endemism within Cyprinodontidae, Cyprinidae and Cichlidae families. Many of these fish are adapted to life in fast-flowing rivers with rocky bottoms. Rare mammals are also found in the ecoregion, including the Vulnerable West African manatee, the Endangered pygmy hippopotamus and the Endangered and endemic Mount Nimba otter shrew. Eleven of the 52 amphibian species present are endemic. Major threats to the ecoregion include anthropogenic pressures associated with agriculture, timber and fuel wood extraction, bushmeat hunting, and extraction of mineral resources.
Upper Niger	Classified as Nationally Important, this ecoregion is home to a rich fish fauna, with species specialized to live in steep and rapidly flowing waters. This specialization is distinguishing for the ecoregion’s aquatic biodiversity. 150 fish species are found in the ecoregion, eight of which are endemic. Several aquatic mammals, reptiles and waterbirds are found in the ecoregion, including the Vulnerable West African manatee. Major threats to this ecoregion are deforestation and land conversion for agriculture.

Ecoregion	Notes
Western Equatorial Crater Lakes	This ecoregion is classified as Globally Outstanding, in particular due to its higher-level taxonomic endemism. The western equatorial crater lakes of Cameroon contain a highly endemic aquatic fauna, with as much as 75 percent endemism in fish. In lake Barombi Mbo, 12 of the 15 fish species present are endemic, and four of the five tilapiine genera are endemic. The lakes also support an endemic sponge and an endemic shrimp. The ecoregion also supports a species rich amphibian fauna with high endemism: one-third of nearly 60 species present are endemic to the surrounding forests. The main threat to the ecoregion is deforestation, which threatens the health of many of the lakes through soil erosion and siltation in some lake basins. Water extraction, pollution, and unsustainable fishing are also impacting the lakes of the ecoregion. Dams have compartmentalized the basin, preventing fish migration upstream.

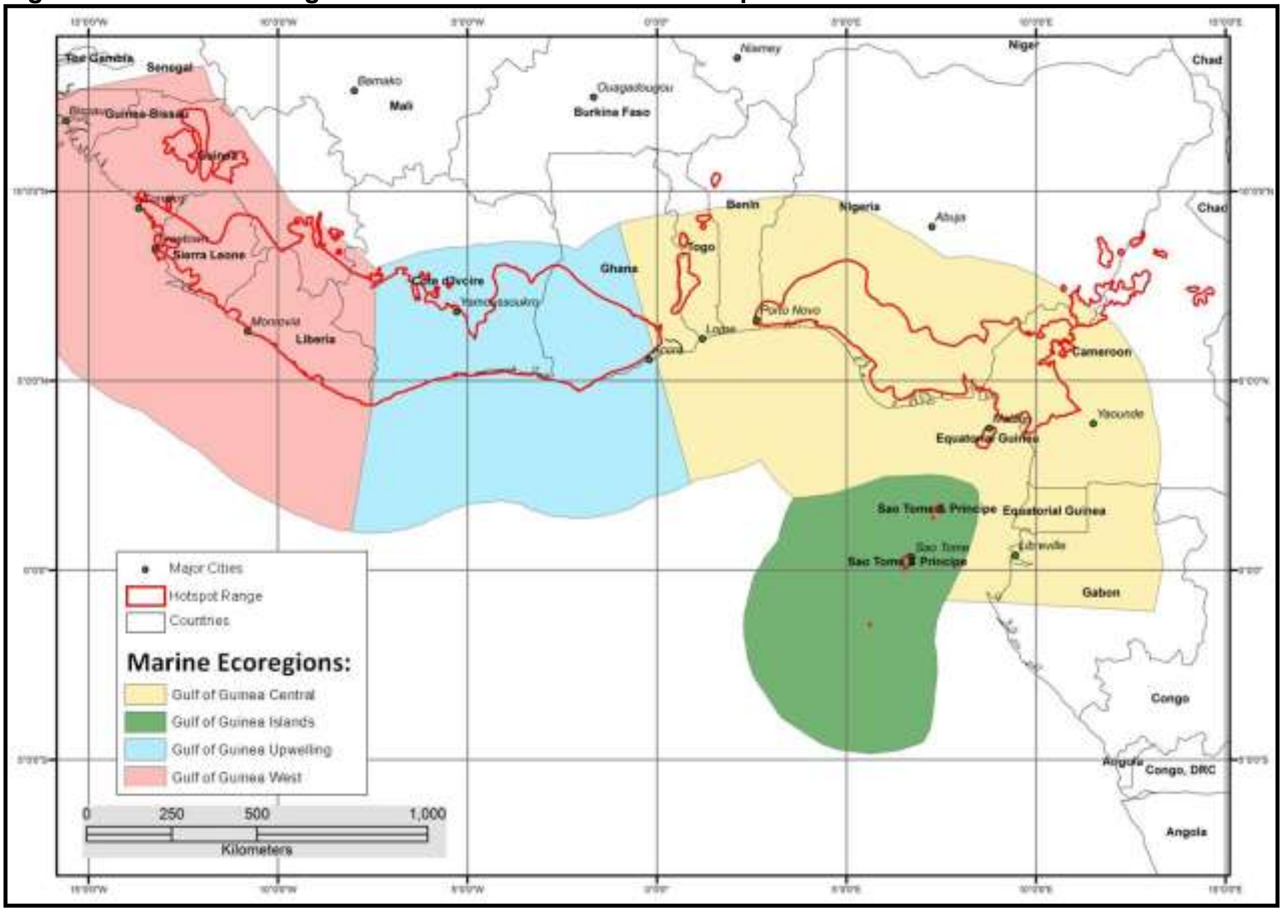
Note: Descriptions of each include indices of biological importance, which use the following categories (ranging from highest to lowest importance): Globally Outstanding; Continentally Outstanding; Regionally Outstanding; Bioregionally Outstanding; Nationally Important; and Locally Important (following Thieme *et al.* 2005).

Marine Ecoregions

The hotspot does not extend into the marine realm. Nonetheless, in order to provide context, the marine biogeography of the West African region is briefly summarized in this section. The hotspot borders four marine ecoregions, as defined by Spalding *et al.* (2007) (Figure 3.5 and Appendix 3). These marine ecoregions all belong to the province of Gulf of Guinea, which is one of the world's most productive marine areas, rich in fisheries resources. The dominant feature of this shallow ocean off the coast of western Africa is the Guinea Current. The Gulf of Guinea is bordered to the north by the Canary Current and to the south by the Benguela Current coastal upwelling region. Coastal geology is dominated by the Volta and Niger basins. The continental shelf is generally narrow, extending 15-90 km offshore, and breaking at depths of approximately 100-120 meters.

There are no coral reefs in this part of Africa. Mangrove forests and swamps are the most biologically significant coastal ecosystems in the Gulf of Guinea region, as they provide critical breeding grounds for many fish and shrimp species, and critical habitat for a variety of other coastal species, including mammals, reptiles, and birds. There are seven species of mangrove native to the region, though most of the mangrove forests are dominated primarily by stands of *Rhizophora racemosa*. Nigeria, Cameroon and Sierra Leone collectively host approximately nine percent of the world's mangrove forests by area, which represents about 42 percent of the mangrove forests in Africa (FAO 2007). The most important mangrove stands in the hotspot are the Niger Delta communities in Nigeria and those in Yawri Bay in Sierra Leone. The mangroves of the Niger Delta are considered to be the largest in Africa, and the third largest in the world (Ukwe *et al.* 2001). Mangrove forests in many areas of the hotspot are threatened by unsustainable logging, pollution and Nipa palm invasion, especially in Nigeria and Cameroon.

Figure 3.5 Marine Ecoregions of the Guinean Forests Hotspot



Source: Spalding *et al.* (2007).

3.6 The Importance of Ecosystem Services in the Hotspot

Ecosystem services can be categorized into four broad groups: provisioning, regulating, supporting and cultural services (Millennium Ecosystem Assessment 2005). A variety of services are provided by the ecosystems found within the hotspot. These services include those that are important at a global scale, such as climate mitigation through carbon storage and sequestration, as well as those benefitting the local communities and individuals, such as those providing essential products to sustain livelihoods, such as food, fuel, building materials and so on. Table 3.4 provides a broad summary of ecosystem services provided within the hotspot.

Table 3.4 Ecosystem Services Provided by the Guinean Forests Hotspot

Type of Service	Ecosystem Service and source within hotspot	Beneficiaries	Relative Importance within the hotspot
Provisioning	Water originating from forests and used for drinking, irrigation, industrial use, energy generation and fishing.	All residents of the hotspot area	Highly important in hotspot and throughout drainages.
	Food and medicine from forest fauna (e.g. bushmeat) and flora.	Rural communities and some urban areas within the hotspot.	Locally important
	Timber for building, firewood and industries	Local communities and national economies	Highly significant in the hotspot and regionally
	Fishery in freshwater and marine systems	All residents of the hotspot	Highly important within the hotspot
Regulating	Micro-climate regulation by forests	All residents of the hotspot	Locally important throughout the hotspot
	Carbon storage and sequestration leading to climate change mitigation	All human kind	Globally important
	Sediment retention	Communities within the hotspot	Significant throughout the hotspot
	Forests provide catchment protection, regulating water flows and water quality	Local communities within the hotspot	Locally important throughout the hotspot
	Flood regulation of coastal systems by buffering rise and fall of flood waters	Local communities within hotspot	Locally Important
Supporting	The forests of the hotspot support high levels of biodiversity and endemism	All humankind	Globally important
	Breeding, spawning and nursery habitat for commercial fish species in the Gulf of Guinea by the mangrove forests and associated habitats	All residents of the hotspot	Highly important regionally
Cultural	Traditional sacred groves, sometimes called “fetish groves”.	Local communities within hotspot	Locally important throughout the hotspot
	Ecotourism opportunities	Local, national, and international tour operators and tourism infrastructure support staff	Locally important throughout the hotspot

3.6.1 Carbon Storage and Climate Mitigation

The hotspot's forests contain high amounts of biomass carbon, which contributes to mediating climate change processes (regulating service) and maintaining biodiversity (supporting service) at the global scale. These forests play an important role in the global climate balance, by emitting or sequestering significant amounts of carbon dioxide, depending on their condition and degree of deforestation or degradation. Undisturbed forests in the hotspot are considered as 'carbon sinks', with uptake of CO_2 exceeding emissions. Conversely, when forests are disturbed through logging, farming, or other utilization activities, they become CO_2 emitters. The hotspot currently contains a mean above-ground biomass carbon content of 160 tonnes per hectare (Lindsell and Klop 2013), increasing to 300 tonnes per hectare in more intact areas.

3.6.2 Timber and Non-Timber Forest Products

At the national and local levels, the hotspot's forests provide a range of ecosystem services for a population of around 200 million, generally poor, people. These services include supplying timber and other building materials, fuel for cooking, in the form of either firewood or charcoal, food (e.g. fruit, fungi, meat) as well as medicines (Norris *et al.* 2010).

Forestry as a production sector in the hotspot can be divided into two broad categories; large scale and smaller-scale exploitation. Large scale includes commercial logging and timber extraction, and plantation forestry (see Chapter 5 for more details). Smaller scale includes local or artisanal exploitation for local use and domestic markets.

Hunting traditions are strong in the Guinean Forest countries, and, for rural people in the hotspot, bushmeat provides a major source of protein for human consumption (see Chapters 5 and 8 for more detail).

3.6.3 Water Services

The hotspot's forests also play essential roles in providing various hydrological functions, such as driving the water cycle itself, protecting water quality, regulating water flows, controlling soil salinity, controlling erosion and sediment deposition, and maintaining aquatic habitats (Ceperley *et al.* 2010; Leh *et al.* 2013), which are essential to the persistence and wellbeing of local communities.

Freshwater ecosystems provide immense benefits to local and national economies and provide the basis for the livelihoods of many of the poorest people within the hotspot (Smith *et al.* 2009). Benefits include flood regulation, where functioning wetlands buffer the rise and fall of floodwaters, provision and purification of water for drinking, and many direct benefits such as provision of building materials, nutrient rich floodplain pastures, medicines, and food such as from the inland fisheries.

From a West African perspective, the major ecosystem service values from water are realised outside the hotspot boundaries, where there is less rainfall and hence water is a more important service. Within the hotspot itself, water supply is generally not limiting and most major cities are supplied from local rivers or existing large dams. Most agriculture in the hotspot is also rain fed, including so-called ‘upland rice’, which is sewn directly into the soil during the rainy season. The most important catchment within the region is the Fouta Djallon Massif (see Figure 3.1), which serves as the water catchment area for a number of the key rivers that flow outside of the hotspot, most notably the Niger and Senegal Rivers.

3.6.4 Coastal Services

Of the estimated 85 million people living in the hotspot, more than 40 percent live in coastal areas and are dependent on lagoons, estuaries, creeks and inshore waters for their sustenance and socio-economic well-being (IGCC 2010). Many people are also reliant on fish protein, which constitutes between 40 and 80 percent of total annual protein consumed per capita (IGCC 2006).

Mangrove habitats and coastal lagoons in West Africa are acknowledged as providing protection against floods, storm surges and erosion (Dahdouh-Guebas *et al.* 2005, Das and Vincent 2009). They are also highly important in nutrient and organic matter processing, sediment control and for the provisioning services (e.g. fisheries) they provide, as well as serving as both a source and sink for nutrients and sediments for other inshore marine habitats such as seagrass beds (Duke *et al.* 2007, Dorenbosch *et al.* 2004; Walters *et al.* 2008, Polidoro *et al.* 2010). Mangroves sequester up to 25.5 million tons of carbon per year (Ong 1993) and provide more than 10 percent of essential organic carbon to the global oceans (Dodd and Ong 2008).

Mangrove areas are critical nursing and spawning grounds for many fish and shrimp species (Mumby *et al.* 2004; Ellison 2008), with offshore commercial fishing in the hotspot relying on mangroves functioning as nursery grounds for many fish species (UNEP 2007).

3.6.5 Tourism Services

Ecosystems in the hotspot provide ecotourism opportunities and sites for recreation activities (cultural). In 2005, West Africa had the strongest tourism performance of the five African regions (North Africa, West Africa, Central Africa, East Africa and Southern Africa) in terms of international tourism receipts growth, with a 21 percent increase compared with 2004. This provided hope that the region would experience a strong growth in tourism. However, this has not happened with civil disturbance, human disease outbreaks, and a persistent poor governance opinion in the minds of tourists, all serving to keep international tourist numbers low, especially in the rainforest regions. By 2012, nine West African countries were among the least globally competitive in terms of tourism. Nevertheless, the region still attracted over 4.5 million visitors and generated USD 3.2 billion in revenue from the tourism sector that year (Weigert 2015).

Throughout the hotspot, and especially in Benin, Ghana and Togo, traditional sacred groves (sometimes called ‘fetish groves’) are designated as areas where resource harvest and, even, entrance by people are highly restricted. These sacred groves are found in all villages and can provide valuable, albeit small, areas of protected forest in farmed landscapes.

3.7 Species Diversity and Endemism

3.7.1 Terrestrial Species Diversity and Endemism

The impressive levels of biodiversity and endemism contained within the Guinean Forests Hotspot are summarized by major taxonomic groups in Table 3.5, and described in the following sections.

Table 3.5 Summary of Species Richness, Endemism and Global Threat Status in the Guinean Forests Hotspot

Taxonomic Group	Status of Red List Assessment	Number of Species in Hotspot	Species Assessed for the IUCN Red List	Number of Endemic Species Assessed	Percentage Endemic
Terrestrial realm					
Mammals	Complete	416	416	65	16
Birds	Complete	917	917	48	5
Reptiles	Partial	>107	107	20	19
Amphibians	Complete	269	269	118	44
Butterflies	Partial	>1,000	141	1	1
Plants	Partial	>9,000	1,030	N/A	N/A
Freshwater realm					
Bony fishes	Complete	632	632	N/A	N/A
Odonates	Complete	316	316	N/A	N/A
Crabs and shrimps	Complete	72	72	N/A	N/A
Mollusks	Complete	105	105	N/A	N/A
Plants	Partial	>397	397	N/A	N/A
Marine realm					
Mammals	Complete	28	28	2	7
Reptiles	Complete	5	5	0	0
Bony Fishes	Partial	>650	104	N/A	N/A
Sharks and rays	Complete	87	87	0	0
Crustaceans	Complete	16	16	0	0
Mollusks	Partial	>38	38	N/A	N/A
Echinoderms	Partial	>6	6	N/A	N/A
Stony corals	Complete	8	8	0	0

Notes: Species are categorized as being endemic to the hotspot if the following criteria are met: a) for terrestrial species, they found only within the hotspot boundaries to within a 25 km buffer zone bordering the hotspot; or b) for freshwater species, they are only known from Level 8 subcatchments entirely within or intercepting the hotspot boundaries. NA = data not available.

Amphibians
Amphibians are relatively poorly documented in the hotspot but there are 269 recorded species and more likely to be discovered in the future (for instance, 11 new species were discovered in the last decade). Of these speciesmore than 80 are endemic, with particularly large numbers of endemics in the Cameroon Highlands. Almost one-third of the hotspot's amphibian species are considered globally threatened (Mallon *et al.* 2015); more information on this topic is provided in Chapter 4.

Birds
The bird diversity in the hotspot is impressive. There are thought to be 917 bird species present, of which 48 are endemic (Mittermeier *et al.* 2004). BirdLife International has recognized six Endemic Bird Areas (EBAs) as lying partly or entirely within the hotspot (BirdLife International 2013a). These are: the Upper Guinea Forests (15 endemic bird species); the Cameroon Mountains (30 endemic bird species); the island of São Tomé (21 endemic bird species); the island of Príncipe (11 endemic bird species); the island of Annobón (three endemic bird species); and part of the Cameroon and Gabon lowlands (six endemic bird species).

Butterflies
Throughout the hotspot, information on the status of butterflies is still quite limited, with only 141 species currently assessed on the IUCN Red List. Information is better for a few individual sites. For instance, the Oban Division of Cross River National Park in Nigeria is thought to support more than 1,000 species of butterfly. Similarly, Gola National Park is another example of a site with an extremely high diversity of butterflies. It is estimated that the site contains in excess of 600 species, or 80 percent of all 750 species currently known from Sierra Leone.

Mammals
The Guinean Forests are among the world's foremost hotspots for mammalian diversity. An estimated 390 terrestrial species are found in the hotspot, representing over one-quarter of the roughly 1,100 total mammal species found on the continent of Africa. More than 60 mammals are endemic to the hotspot, and noteworthy endemic species include two of the rarest antelopes in the world: the Endangered Jentink's duiker and the Vulnerable zebra duiker (*C. zebra*). Other globally threatened species include the Endangered pygmy hippopotamus and the Vulnerable Liberian mongoose (*Liberiictis kuhnii*).

The hotspot is renowned for its primate diversity, as it contains 30 species, six of which are endemic to the Upper Guinean Forests subregion, and nine to the Nigeria Cameroon subregion. There are also four endemic primate subspecies on Bioko Island. Among the primate species found in the hotspot, the striking Diana monkey (*Cercopithecus diana*) is thought to be an important indicator of forest health because of its dependence on high-canopy forests, while olive colobus (*Procolobus verus*) is the world's smallest colobine monkey. The hotspot is also home to two endemic subspecies of chimpanzee. West African chimpanzee (*Pan troglodytes verus*) occurs in scattered populations, mainly in Côte d'Ivoire and Guinea; it is assessed as Endangered at the subspecific level, making it one of the most threatened subspecies of chimpanzee (Humle *et al.* 2008). The Nigeria-Cameroon chimpanzee (*P. t. ellioti*) is even more threatened than its western neighbour, although it is also assessed as Endangered. As the name suggests, it is found only in Nigeria and Cameroon, where it has a restricted distribution and a population estimated at only 6,500 individuals (Oates *et al.* 2008b). The forests along the Nigerian-Cameroonian border are also home to a small population of an endemic subspecies of western gorilla: Cross River gorilla (*Gorilla gorilla diehli*). This subspecies has a very restricted distribution, with a total population of less than 300 individuals, fragmented into 9-11 subpopulations, some of which are in tenuous reproductive contact with each other, meaning that the subspecies is assessed as Critically Endangered (Oates *et al.* 2008a).

Plants

The hotspot is estimated to contain more than 9,000 vascular plant species, of which around 20 percent are thought to be endemic (Mittermeier *et al.* 2004). Within the hotspot, high levels of local endemism at the species level can be found. Taï National Park in Côte d'Ivoire, Mount Nimba on the Liberia-Guinea-Côte d'Ivoire border, Cross River National Park in Nigeria, and Mount Cameroon are especially species rich areas in the hotspot in terms of plants. Nearly 2,500 plant species have been recorded on Mount Cameroon alone. Because of their relative isolation from the rest of the hotspot, the Gulf of Guinea Islands also support a highly endemic flora, and approximately 185 species are endemic to these islands.

Reptiles

The diversity of reptile species is poorly documented in western Africa, although it is suggested that more than 200 species are found in the region, of which a quarter are likely to be endemic. Eighteen of the 24 reptiles found on the islands of São Tomé, Príncipe and Annobón are endemic, and all three species of African crocodiles are found within the hotspot.

3.7.2 Freshwater Species Diversity and Endemism

An assessment of freshwater biodiversity across the western Africa region reported a high diversity of aquatic species with high levels of endemism (Smith *et al.* 2009). Within the freshwater realm (as can be seen in Table 3.5), although many freshwater species are restricted range and endemic to the western Africa region, because the hotspot boundary does not follow catchment boundaries, these species are also present outside of the hotspot itself so cannot be classed as hotspot endemics. Lake endemic species have also been mapped to their presence within subcatchments, and so will also appear to be present outside the hotspot in many cases. It is, therefore, difficult to determine the exact number of freshwater species endemic to the hotspot. Around 14 percent of all species assessed are regionally threatened according to IUCN Red List Categories and Criteria (Smith *et al.* 2009).

The majority of threatened species are found in the Niger Delta and in southeastern Nigeria, largely reflecting the greater levels of development and population density in these areas. Five areas have been identified as key centers of species diversity (Smith *et al.* 2009):

i. The southern coastal area of Guinea;
ii. The lower River Jong in Sierra Leone;
iii. Ebrié Lagoon in Côte d'Ivoire;
iv. Lower Ogun and Oueme Rivers and their coastal lagoons in Benin, and;
v. Western Nigeria and the Niger Delta to the lower Cross River in southern Nigeria.

The combined diversity of fishes, mollusks and odonates (dragonflies and damselflies) is exceptionally high in these areas. Levels of regional endemism are high, with over a third of the assessed species found only in western Africa. The majority of these endemic species are found within the coastal drainages of the Upper Guinean Forests subregion from southern Guinea to Liberia and in the basins of western Ghana and eastern Côte d'Ivoire.

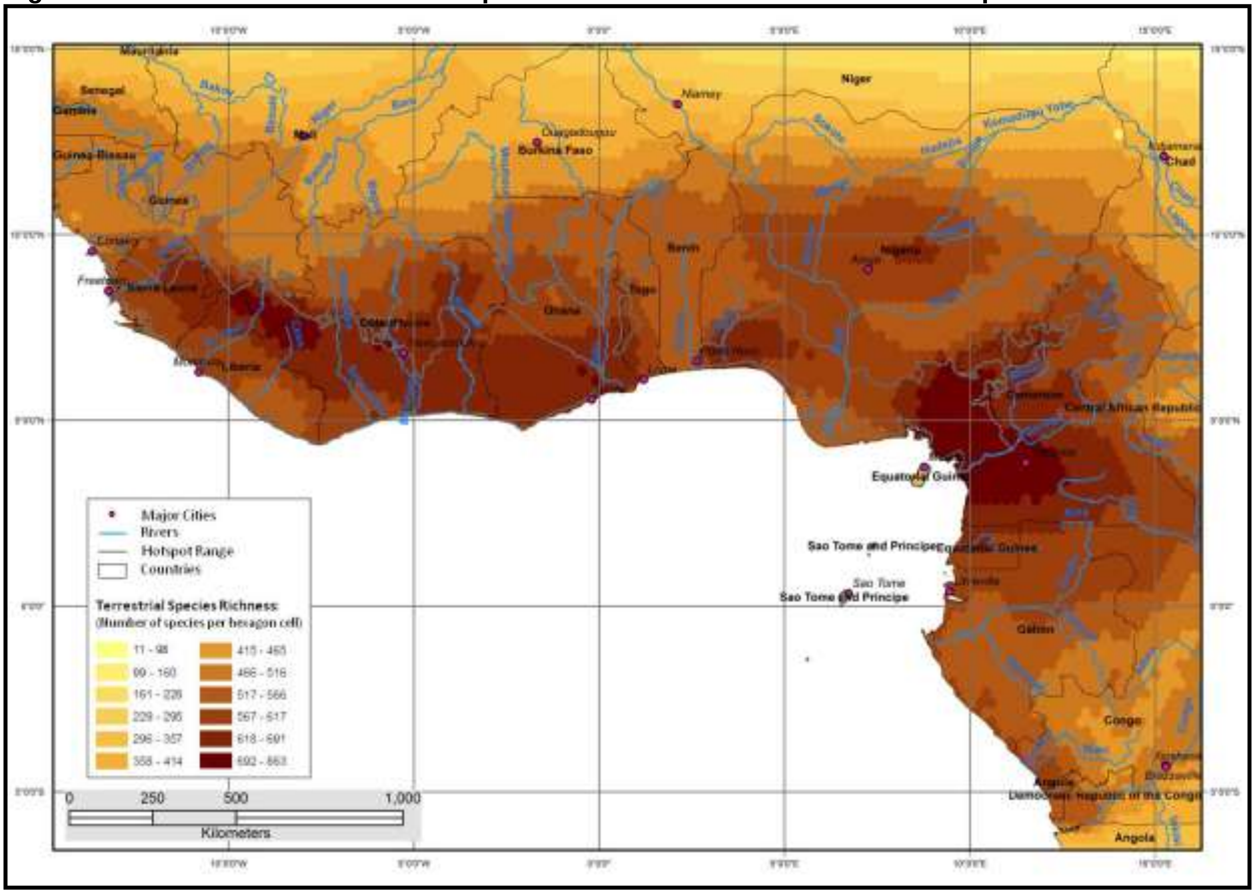
The hotspot supports a remarkable diversity of freshwater fishes: 1,281 species, of which 35 percent are considered endemic (Paugy *et al.* 2003). About one-quarter of the world's 350 species of killifish are found in the hotspot, around half of which are endemic. Cichlids are also prominent, with more than half of the 60-plus species present endemic to the hotspot. Four of the five endemic genera of cichlids are found only in Lake BarombiMbo in southwest Cameroon (Mittermeier *et al.* 2004). The hotspot also supports a high diversity of many other freshwater taxa, including freshwater crustaceans, mollusks, odonates and freshwater plants (Smith *et al.* 2009).

Coastal wetlands provide unique ecological conditions and habitats for Palaearctic migratory birds that overwinter in West Africa every year. There are approximately 148 species of coastal and marine seabirds that are reported to occur in the Gulf of Guinea region. A number of seabirds breed in the area between Sierra Leone and Congo, including several species of tern, white-tailed tropicbird (*Phaethon lepturus*), brown booby (*Sula leucogaster*), and both black and brown noddies (*Anous minutus* and *A. stolidus*).

3.7.3 Species Richness Patterns

The distribution ranges of all mapped species known to be present within the hotspot were used to create maps of species richness for terrestrial and freshwater species (Figures 3.6 and 3.7, respectively), and these provide a means to broadly identify those areas within the hotspot where the highest numbers of species are concentrated. Centers of species richness for terrestrial species include the Cameroon-Highlands-to-lowland-forest transition in Cameroon and Nigeria, and the Guinean-lowland-to-montane-forest transitions on high altitude peaks and plateaus in Guinea, Sierra Leone, Liberia and Côte d'Ivoire, including the Mount Nimba area. Centers of species richness for freshwater species include the Niger Delta, the Cameroon Highlands (which include the region's many crater lakes), the lower courses of the many coastal rivers in Sierra Leone, Liberia, Côte d'Ivoire, western Ghana, and the lower Ogun drainage in western Nigeria.

Figure 3.6 Distribution of Terrestrial Species within the Guinean Forests Hotspot

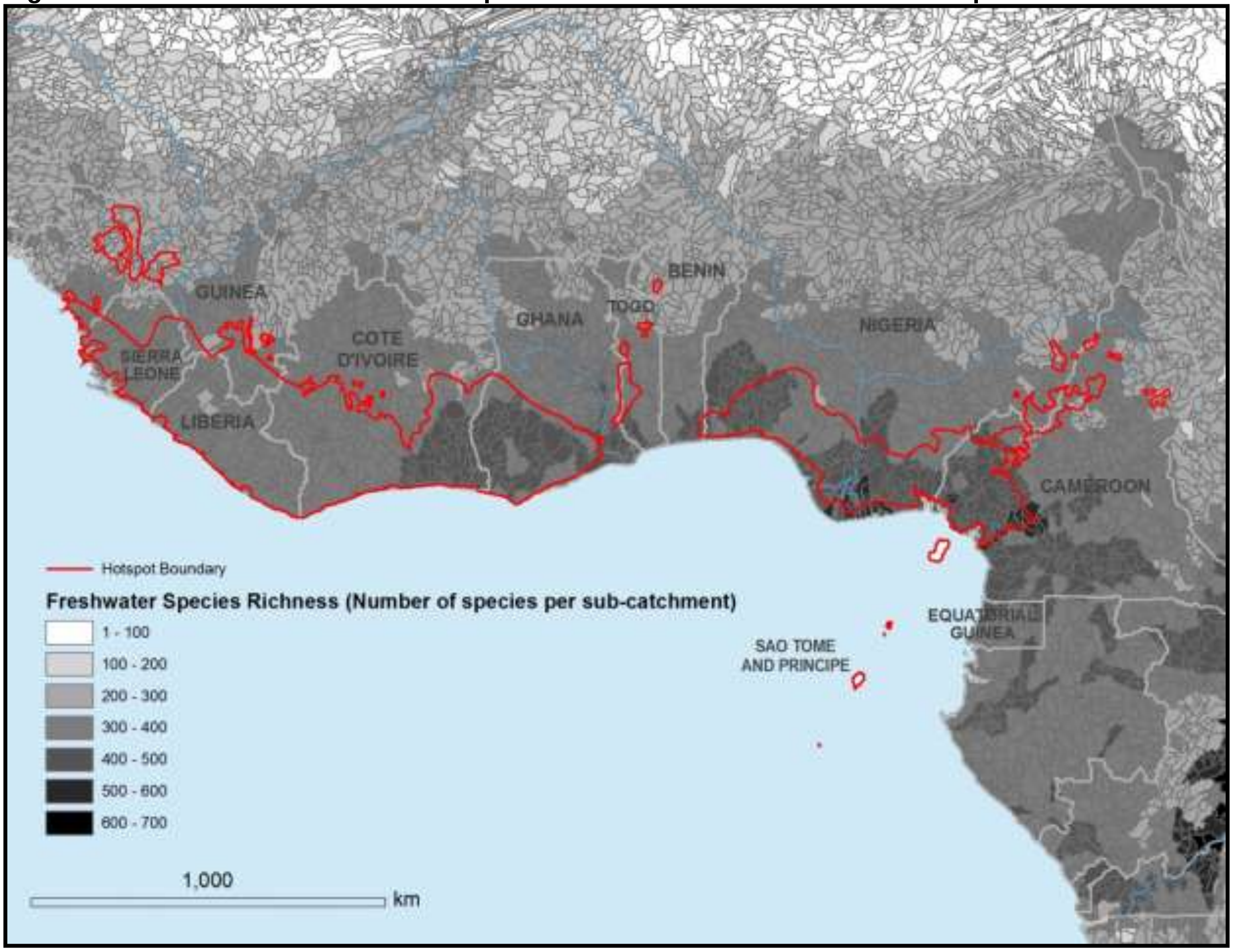


Source: IUCN Red List version 2013.
Note: Species richness is represented as the number of species recorded within each hexagon grid cell.

3.7.4 Marine Species Diversity and Endemism

The highest marine fish diversity in the Eastern Central Atlantic is found in the Gulf of Guinea and its near-shore marine habitats, including estuaries, deltas and coastal lagoons. More than 650 species of marine bony fish and 87 species of cartilaginous fish (sharks and rays), as well as at least five species of shrimps, are found in the area between Sierra Leone and Cameroon, including the offshore islands. More than 54 percent of the region's sharks and rays with sufficient data for an assessment are globally threatened (IUCN 2015a). Recently completed (November 2015) global assessments for all of the deep-water and near-shore marine bony fishes indicate that approximately five percent of all marine fishes are threatened but with significantly higher proportions of threatened near-shore fishes compared to deep-water fishes. Near-shore bony fish families with relatively high species richness in the region include blennies (Blennidae), gobies (Gobiidae), wrasses (Labridae), groupers (Serranidae), jacks (Carangidae), seabreams (Sparidae) and croakers (Sciaenidae), with the latter four families being heavily targeted by coastal fisheries. Shrimp species of the families Penaeidae and Palemonidae are also targeted by fisheries in the region. Several endemic species of goby (*Didogobius amicuscaridis*, *Gorogobius stevcici*), clingfish (*Apletodon wirtzi*) and wrasse (*Clepticus africanus*, *Thalasso manewtoni*) are known only from around the offshore islands of São Tomé and Príncipe.

Figure 3.7 Distribution of Freshwater Species within the Guinean Forests Hotspot



Notes: Species richness is represented as the number of species recorded within each river/lake subcatchment, where a subcatchment is mapped according to the HydroBASIN Level 8 catchment GIS layer.

4. CONSERVATION OUTCOMES DEFINED FOR THE HOTSPOT

4.1 Introduction

Selection of conservation outcomes relies on the understanding that biodiversity is not measured in any single unit. Rather, it is distributed across a hierarchical continuum of ecological scales that can be categorized into three levels: i) species; ii) sites; and iii) broad landscapes (or ecosystem-level units), termed corridors. These levels interlock geographically through the occurrence of species at sites and species and sites within corridors. Given the threats to biodiversity at each of these three levels, targets for conservation can be set in terms of 'extinctions avoided' (species outcomes), 'areas protected' (site outcomes) and 'corridors consolidated' (corridor outcomes). Species are selected as those classified as threatened according to the IUCN Red List of Threatened Species (hereafter known as the IUCN Red List). Sites are identified as KBAs, places that "contribute significantly to the global persistence of biodiversity", for example by supporting threatened species and species with severely restricted global distributions, and are delineated as areas of land and/or water that are actually or potentially manageable as a single unit (e.g. a protected area or other managed conservation unit). Landscape corridors are delineated to link KBAs (in particular for transfrontier areas), secure landscape connectivity such as within river catchments, and maintain ecosystem function and services for long-term species survival. Following this approach, quantifiable measures of progress in the conservation of threatened biodiversity can be tracked across the Guinean Forests Hotspot, allowing the limited resources available for conservation to be targeted more effectively.

Defining conservation outcomes is a bottom-up process that follows a standard methodology (Langhammer *et al.* 2007). It starts from the definition of species-level targets, from which the definition of site-level targets is then developed. The process requires detailed knowledge of the conservation status of individual species. This information has been accumulating in the IUCN Red List for more than 50 years. For the Guinean Forests Hotspot, the conservation status of species has been comprehensively assessed for many taxonomic groups but there are notable gaps in the assessments of plants and some reptiles. Identification of KBAs is also incomplete for some taxa and regions of the hotspot with the identification of terrestrial KBAs in the Lower Guinean Forests subregion, in particular, requiring additional work. Additional information on the availability of information on species and site outcomes is given in the relevant sections below.

Conservation outcomes were defined using best-available species distribution data, followed by expert review and validation procedures involving confirmation of species presence in the hotspot. KBA information collated for the hotspot comes from three main data sets: i) data on Important Bird Areas (IBAs) compiled by BirdLife International and stored on the World Biodiversity Database (WBDB), from where it was extracted and provided to IUCN for use in the profile in November 2013; ii) data on terrestrial KBAs in the Upper Guinean Forest subregion compiled by Conservation International between 2008-2010, as extracted from the WBDB and provided to IUCN in November 2013; and iii) data on the freshwater KBAs identified by IUCN's Global Species Programme on the basis of Red List assessments of freshwater taxa completed in 2009.

Stakeholder input to supplement and verify the information on conservation outcomes was provided through three workshops, responses to circulated questionnaires, and consultations with BirdLife International and its partner NGOs in the hotspot countries in October 2015. The information was also cross-checked with the results of the IUCN/UNEP situation analysis on large terrestrial and freshwater fauna in west and central Africa (Mallon *et al.* 2015). It must be noted, however, that the outbreak of Ebola in the region made it difficult to obtain the desired level of stakeholder input and, consequently, information on additional outcomes may be forthcoming at a later date. The number of experts previously consulted in compilation of the species Red List assessments used to determine conservation outcomes within the hotspot is estimated to exceed 150 people, including from within the region and from the wider international community of species experts, while many other experts were involved in the consultations and research undertaken by the BirdLife Partnership that led to the original identification of IBAs, which underpin much of the analysis of site outcomes.

4.2 Species Outcomes

At least 936 species found in the hotspot are globally threatened (Table 4.1). This number is likely to increase significantly as more species are assessed in the future, particularly in groups such as plants and reptiles. A significant proportion of the species that have been assessed are not well-known, with 389 species (8 percent of those assessed to date) being classified as Data Deficient, meaning that there is insufficient information available to make a reliable assessment of their current risk of extinction using the IUCN Red List criteria. The globally threatened species include 135 assessed as Critically Endangered: the highest category of threat.

Table 4.1 Globally Threatened Species in the Guinean Forests Hotspot

Taxonomic Group	Global Threat Status			Total
	CR	EN	VU	
Mammals[1]	6	29	30	65
Birds[1]	5	12	31	48
Reptiles[2,3,4]	2	3	6	11
Amphibians[1]	13	42	22	77
Bony fishes[1]	35	59	78	172
Sharks and rays[1]	4	8	21	33
Butterflies[3,4]	0	0	2	2
Odonates[1]	4	4	8	16
Freshwater crabs and shrimps[1]	2	9	5	16
Mollusks[1]	2	6	5	13
Plants[4,5]	62	98	323	483
Total	**135**	**270**	**531**	**936**

Source: IUCN Red List version 2013; exported in January 2014.
[1]All known described species. [2]Species endemic to the hotspot. [3]Random representative sample. [4]*Ad hoc* selection. [5]Species within selected families of aquatic plant.

The distribution of the major taxonomic groupings of threatened species, combined across all three realms, in each of the countries in the hotspot (Table 4.2) shows the highest proportion are located in Cameroon (61 percent) followed by Nigeria (31 percent), Côte d'Ivoire (22 percent) and Ghana (22 percent). The full list of species outcomes for each country within the hotspot is presented in Appendix 4.

The main information source used for identifying species known to occur within the hotspot was the IUCN Species Information Service (SIS), the database of species information supporting the IUCN Red List. Where available, the analysis incorporated additional information on more recently assessed species that became available after the data were exported in January 2014.

Species distribution files (GIS shape files) were obtained for as many of these species as possible, although not all species, especially plants, had been mapped. Species ranges intersecting the hotspot were identified to generate a list of all species with distribution ranges overlapping or contained within the hotspot. This list of species represents the list of species considered to be present within the hotspot and upon which the hotspot analysis of biodiversity is based.

Table 4.2. Breakdown of Globally Threatened Species by Country and Major Taxonomic Group

Taxonomic Group	Distribution by Country										
	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea	Ghana	Guinea	Liberia	Nigeria	São Tomé & Príncipe	Sierra Leone	Togo
Mammals	10	45	20	19	13	20	18	21	5	14	8
Birds	10	23	20	6	17	18	13	18	13	14	10
Reptiles	4	5	5	6	4	6	5	4	5	5	3
Amphibians	0	61	14	2	11	5	4	13	3	2	1
Bony fishes[1]	10	82	24	12	21	57	31	31	6	27	7
Sharks and rays	16	20	20	13	20	24	21	24	7	21	15
Butterflies	0	0	0	0	2	0	0	0	0	0	0
Odonates	1	10	1	2	0	0	2	7	1	3	0
Freshwater crabs and shrimps	0	4	0	1	1	3	5	5	1	0	0
Mollusks[1]	0	6	2	0	0	0	1	0	1	3	0
Plants	14	380	117	63	127	25	51	179	36	60	10
Total	**65**	**636**	**223**	**124**	**216**	**158**	**151**	**302**	**78**	**149**	**54**
Percentage of the total[2]	7	61	22	11	22	15	16	31	8	15	6

Source: IUCN Red List version 2013; exported in January 2014.
[1]Primarily freshwater species as the majority of marine species were yet to be assessed in January 2014.
[2]Calculated as a percentage of the 936 globally threatened species found in the hotspot; these figures do not add up to 100 percent because many species are found in more than one country.

Species with distribution ranges fully enclosed within the hotspot boundaries were considered to be endemic to the hotspot. A 25 km buffer beyond the hotspot boundary was employed to account for the lack of precision in mapping species ranges close to the hotspot boundary. For species with no distribution files available, the narrative description of the species's geographic distribution in the species's account on the IUCN Red List was used to determine if the species was within the hotspot or not, and (to the extent possible) whether it was endemic to the hotspot or not.

A number of taxonomic groups are considered to have been comprehensively assessed. For some taxonomic groups, only a random sample of species has been assessed (e.g. butterflies and reptiles). In other cases, an *ad hoc* list of species has been assessed, with a likely bias towards those expected to be threatened. Although the main focus of this profile is the terrestrial and freshwater environments, species found in near-shore marine habitats were also included where information was available.

The following overview of threatened species within the hotspot is compiled separately for each of the three realms: terrestrial; freshwater; and marine (focusing on near-shore habitats adjacent to the hotspot boundary). This distinction is made in order to highlight threatened biodiversity within each of the realms, as some types of threat may be realm specific and might otherwise not be noted.

4.2.1 Terrestrial Realm

Plants

Around half of the 1,030 plant species in the hotspot so far assessed for the IUCN Red List are threatened. For these species, a broad spatial analysis shows a significant gap in coverage by the protected areas network in the hotspot (Burgess *et al.* 2005). This gap in spatial cover of protected areas is somewhat reduced by the inclusion of forest reserves but in reality many of these reserves may provide little real conservation benefit.

Two species are believed to be extinct but little is known about either. *Byttneria ivorensis* (EX), a tree species in the family Sterculiaceae was identified from a single herbarium specimen collected from Côte d'Ivoire in 1896 and *Argocoffeopsis lemblinii* (EX) is another tree species also known only from a single herbarium specimen. Sixty-two species are Critically Endangered, including many species of orchids, legumes and members of the coffee family (Rubiaceae). The majority of these species are found in Cameroon, which has to date been the main geographic focus for assessment of plant species for the IUCN Red List. Seven of the Critically Endangered orchid species are found in Cameroon, and many additional species assessments are in draft but not yet published, meaning this number is likely to rise. For example, *Bulbophyllum filiforme* (CR), an orchid species known only from Mount Cameroon, Korup National Park and the Niger Delta is an epiphyte, growing in lowland evergreen forest, where its association with forest tree species makes it vulnerable to forest clearance. Another species, in the related Burmanniaceae family, *Afrothismia winkleri* (CR), is known from just five localities in Cameroon and Uganda with recent discoveries on Mount Kupe, Korup and Banyang Mbo. As is usual for species in this family, numbers at each site are very low and it is believed that only 16 individuals have been seen in total.

Despite this being a forest hotspot, information on the status of trees remains very poor. For example, six of the eight highly valued mahogany species present in the hotspot were last assessed for the IUCN Red List in 1998 and are in need of updating. Of these species, the African mahogany (*Khaya ivorensis*), which is found in five countries of the hotspot, is listed as Vulnerable due to very high levels of exploitation, although its status has not been re-assessed since 1998. Overall, the conservation status of very few of the important timber species has yet been assessed. Inventories are available for many of these trees for the majority of countries in the hotspot (see Poorter *et al.* 2005), so it should be possible to assess their global threat status.

The Nigeria-Cameroon border, and the Cross River National Park in particular, supports the largest tract of remaining primary rainforest in Nigeria, and is especially rich in endemic plants, which are thought to be threatened by degazettement of forest reserves leading to increased urbanization, commercial plantations and logging (Borokini *et al.* 2014). Such species include, *Synsepalum glycydora* (VU), a small tree species apparently restricted to the Oban Hills in Cross River National Park and Degema in Rivers State, and *Talbotiella eketensis* (EN), a swamp forest tree from areas around Eket and Degema, where its habitat has been seriously degraded by oil exploration and logging activities. The area is also one of the richest in the hotspot for orchids and commercially important species in the Rubiaceae (Droissart *et al.* 2011) and has generally high levels of genetic distinctiveness (Dauby *et al.* 2014).

The endemic flora of São Tomé (Figueiredo *et al.* 2011) is also highly threatened, with nearly all areas outside the Obô National Park impacted by urbanization and intensification of agroforestry and other land-use practices. Development and expansion of oil palm plantations also represents an increasing threat to the flora in many parts of the hotspot (Mallon *et al.* 2015), with cases including São Tomé (Lopes 2012) and northwestern Cameroon (Hoyle and Levang 2012). There are also three Critically Endangered plant species on Bioko, including a very rare species of begonia, *Begonia pelargoniflora*, which is only known from four subpopulations two of which are on Bioko and one each from the Bakossi Mountains and the adjoining Mount Nlonako in Cameroon.

Further west in the hotspot, the Mount Nimba area is recognized for its high diversity of plant species many of which, although not yet assessed for the IUCN Red List, will likely be threatened, in particular due to mining activities, logging and deforestation. Of the few assessed plant species in the western parts of the hotspot most, such as *Neolemonniera clitandrifolia* (EN), a tree species occurring in low densities in Atewa Range and Cape Three Points Forest Reserves and Ankasa Resource Reserve, are threatened by habitat loss due to agricultural expansion, mining and logging.

In summary, the level of threat presented in Table 4.1 is not considered representative of the full flora of the Guinean Forests, as the limited sample of species currently assessed is likely biased towards those expected to be threatened *a priori*. The 1,030 terrestrial plant species from the hotspot that have been assessed for the IUCN Red List only represent a small fraction of the more than 9,000 species of vascular plants estimated to occur in the hotspot (see Table 3.5). A comprehensive assessment of all species within the hotspot is, therefore, needed before the true level of threat can be determined. It is also clear that the greatest geographic coverage of plant species assessments is for Cameroon, with the status of species in the rest of the hotspot remaining rather poorly known. Even within Cameroon, there remain major gaps, although efforts are underway to expand the coverage of the global Red List, with a particular focus on those species assessed as threatened on the Cameroon National Red List (C. Hilton-Taylor, pers comm.).

Mammals

Sixty-five of the 416 mammal species occurring in the hotspot (16 percent) are threatened, including a number of iconic species, such as western gorilla, chimpanzee, lion (*Panthera leo*), pygmy hippopotamus (near endemic to the hotspot), African elephant and drill. The primates, rodents, shrews and bats are however the dominant (in terms of the number of species) and most threatened groups of mammals, impacted mainly by hunting and deforestation due to agricultural expansion and logging.

Western gorilla, found in Cameroon and Equatorial Guinea within the hotspot, is Critically Endangered due to a combination of exceptionally high levels of hunting and disease-induced mortality. Most protected areas have serious poaching problems and animals in almost half of the habitat under protected status have been hit hard by Ebola. Both commercial hunting and Ebola-induced mortality are continuing and even accelerating (Walsh *et al.*, 2008; Ryan and Walsh 2011). Chimpanzee, which has subpopulations across much of the hotspot, is assessed as Endangered, also due to high levels of hunting, loss of habitat and Ebola.

A subspecies of the black rhinoceros (*Diceros bicornis longipes*) is now thought to have gone extinct in its last known habitats within the hotspot in northern Cameroon (Emslie 2012), largely as a result of increased poaching for the international rhino horn trade fueled by civil unrest and free flow of weapons across the region. Lion (VU), however, remains present but in small fragmented subpopulations, with an estimated 400+ individuals remaining in western Africa (Henschel *et al.* 2014) where it's regional status is Critically Endangered. The largest numbers are, however, thought to be in Cameroon just outside the hotspot boundaries (Mallon *et al.* 2015).

Pygmy hippopotamus (EN), a species near endemic to the hotspot, occurs only in Liberia, Côte d'Ivoire, Guinea and Sierra Leone, with the majority of the population in Liberia. A suspected population in the Niger Delta has apparently gone extinct. In 1993, it was estimated that there were only 2,000-3,000 individuals remaining and subsequent reports of habitat loss and hunting suggest the population has since decreased (Lewison and Oliver 2008). The species is included in Appendix II of CITES (as *Hexaprotodon liberiensis*), which provides some controls on international trade. Sapo National Park and Taï National Park are two key sites for the species. A National Action Plan has been developed for its conservation in Liberia and is currently being implemented (FFI and FDA, 2013).

Of the many antelope species found in the hotspot Jentink's duiker is possibly the most threatened, being assessed as Endangered with its population estimated to have declined to only around 2,000 individuals, mainly as a result of ongoing habitat loss and bushmeat hunting. Being primarily a forest species, conservation of remaining primary forest, particularly in Taï and Sapo National Parks, is critical. This species is listed on CITES Appendix I.

Finally, African elephant (VU), Africa's largest land mammal and an iconic species has, in recent years, been subject to increased poaching at catastrophic rates across the wider region suggesting that sustainable thresholds may have been crossed. Population estimates by country are provided in the 2013 Provisional Elephant Status Report (Elephant Database and IUCN SSC African Elephant Specialist Group 2013). Preliminary genetic evidence suggests that there may be at least two species of African elephant, provisionally named savanna elephant and forest elephant. Both of these postulated species occur in the hotspot, with populations of savanna elephant being found in Côte d'Ivoire (e.g. Taï National Park), Western Ghana (e.g. Bia National Park) and Cameroon, and small populations of forest elephant being found in Cameroon (e.g. Korup National Park), Liberia (e.g. Sapo National Park) and Nigeria (e.g. Okomu National Park). The current position of the African Elephant Specialist Group is that reclassification into multiple species would be premature, and more extensive research is required (Blanc 2008).

Birds

Forty-eight of the 917 birds recorded in the hotspot (five percent) are threatened. The main threats are once again agricultural expansion, hunting, and loss of habitat due to logging. Of the five Critically Endangered species, all appear to have highly restricted ranges within small remaining forest fragments. São Tomé grosbeak (*Neospiza concolor*) and São Tomé fiscal (*Lanius newtoni*) are both known from a very small area of primary forest on São Tomé (IUCN 2014), which currently remains unprotected. Dwarf olive ibis (*Bostrychia bocagei*) is also known only from São Tomé, where it is confined to the catchments of the São Miguel, Xufexufe and possibly the Quija rivers in the southwest, and along the Io Grande and Ana Chaves rivers in the centre of the island (IUCN 2014). The most recent estimate puts the total population at between 50 and 250 mature individuals. Liberian greenbul (*Phyllastrephus leucolepis*), is only known from a few forest fragments in southeastern Liberia but has not been recorded since its original discovery in 1985 (IUCN 2014). The fifth Critically Endangered bird species is Príncipe thrush (*Turdus xanthorhynchus*), which is endemic to the island of Príncipe. It is found only in the remaining forests in the centre and south of the island, and has a population estimated at fewer than 250 mature individuals.

A notably high proportion of vultures are threatened with extinction, and four Endangered and two Vulnerable species are known from the hotspot. The distribution of White-backed vulture (*Gyps africanus*) overlaps marginally with the hotspot, particularly in Ghana, Togo, Benin and Nigeria. It is globally Endangered and has declined by more than 90 percent in western Africa, having completely disappeared from Ghana with the exception of Mole National Park (which is outside the hotspot boundary) and is likely extinct in Nigeria (BirdLife International 2013b). These significant declines are, as is the case for other vulture species present (or marginally present) in the hotspot, due to overexploitation for food and traditional medicine, lack of food due to the severe depletion of wild ungulates and changes in methods of carcass disposal, and secondary poisoning from carburofan and other toxins inserted into animal carcasses to kill mammalian predators(Mallon *et al.* 2015 and references therein).

Three species of weavers are also Endangered. Gola malimbe (*Malimbus ballmanni*) is endemic to the hotspot where it is confined to parts of the Upper Guinea rainforest in Sierra Leone (Gola Forest), Liberia (Grande Gedeh/Sinoe County), Côte d'Ivoire (Cavally and Goin Débé Forest Reserves) and Guinea (BirdLife International 2012). Ibadan malimbe (*M. ibadanensis*) is another highly restricted-range species, found in southwestern Nigeria. The population was estimated at around 2,500 individuals within 112 km^2 of remaining forest. This can be considered a reasonable maximum estimate of the world population since the survey covered almost all remaining forest fragments within the species' historical range (Manu *et al.* 2005, cited in BirdLife International 2012). Forest clearance and fragmentation are listed as the main reasons for the suspected ongoing decline in population. Bates's weaver (*Ploceus batesi*) is a rare species from southern and western Cameroon, occurring in a narrow belt from Limbé, at the foot of Mount Cameroon, east to Moloundou (BirdLife International 2012). Plans for a 70,000 hectare oil palm plantation threaten to significantly fragment large areas of suitable habitat in southwestern Cameroon (Linder *et al.* 2012, cited in BirdLife International 2012).

Reptiles

Information on reptiles is rather incomplete for the hotspot. Eleven of the 107 reptile species to have been assessed are threatened (10 percent). However, this is likely not representative of the state of reptiles across the hotspot, as few species east of Nigeria have been assessed. Four of the most severely threatened reptile species in the hotspot are marine turtles (see Section 4.2.3). Other threatened reptiles include the Critically Endangered Annobón lidless skink (*Afroablepharus annobonensis*) is, as the name suggests, endemic to Annobón Island, where it is threatened by habitat loss and, potentially, predation by introduced species. West African dwarf crocodile is listed as Vulnerable but the assessment was completed in 1996 and requires updating. Although this species is very important in the bushmeat trade, it is not currently considered to be under threat (Mallon *et al*. 2015).

Amphibians

Seventy-seven of the 269 amphibian species in the hotspot (29 percent) are globally threatened, mainly due to the habitat loss/degradation resulting from expanding urban and commercial developments, agricultural expansion, and logging. Of these species, the majority are concentrated in Cameroon, which supports 61. Thirteen of the hotspot's amphibians are Critically Endangered. It should, however, be noted that the level of threat may be even higher than currently recognized, as the increased intensity of harvesting in the region has not yet been factored into many amphibian assessments (Mallon *et al.* 2015). One notable species is goliath frog (*Conraua goliath*), which is the largest frog in the world at up to 3 kilograms. Within the hotspot, it is found in southeastern Cameroon, where it is threatened by heavy harvesting for food. This species is also exported for frog racing to countries including the United States.

As shown in Table 3.5, an estimated 44 percent of the amphibian species found in the hotspot are endemic to it. The Cameroon Highlands, in particular, contain many highly threatened and restricted-range endemic species and are one of the two areas of mainland Africa with the highest diversity of amphibians (Hansen *et al.* 2009, Penner *et al.* 2011), underlining the exceptionally high importance of the region for the conservation of amphibian diversity. As an example a Critically Endangered restricted-range amphibian species in Cameroon, *Alexteroon jynx* is known only from two localities 6 km apart on the eastern slopes of the Rumpi Hills in southwestern Cameroon (IUCN 2014). As another example, Lake Oku clawed frog (*Xenopus longipes*) is endemic to Lake Oku on Mount Oku, western Cameroon (IUCN 2014). The species is unable to move across land effectively and is restricted to this shallow, eutrophic lake where it fills the ecological niche typical of predatory fishes. The main threat in this case is the risk of introduction of a predatory fish species. The Endangered Mertens' egg frog (*Leptodactylodon mertensi*) and its Critically Endangered cogener, *L. erythrogaster*, co-exist on Mount Manenguba around springs and streams in submontane and lower montane forest. These species are thought to be fairly resilient to disturbance but the ongoing degradation of habitat due to expansion of farming activities, coupled with their highly restricted range, puts them at risk. As a final example, of the highly threatened and restricted-range frogs of the Cameroon Highlands, *Astylosternus nganhanus* is only known from Mount Nghanha on the Adamawa Plateau, where it is at risk from habitat loss due to farming expansion (IUCN 2014).

Although Cameroon is the clear center for threatened amphibians in the hotspot, there are also a number of threatened species in other countries. In Ghana, the Critically Endangered frog, *Phrynobatrachus intermedius*, is known from only two sites in Ankasa Resource Reserve, where it occurs in swampy areas within primary rainforest. It is threatened by forest degradation, in particular due to plantations of raffia palm. The Critically Endangered Mount Nimba viviparous toad (*Nimbaphrynoides occidentalis*) is only known from the Mount Nimba area in Guinea, Côte d'Ivoire and Liberia where, although partly located within a World Heritage Site, it is threatened by a proposed iron ore mining concession and the arrival of large numbers of refugees (UNESCO 2013). Finally, the Critically Endangered Taï toad (*Amietophrynus taiensis*) is a very rare species only known from Taï National Park in Côte d'Ivoire and nearby Gola Forest Reserve in Sierra Leone. Very little is known about this species which could benefit from additional survey and research.

Butterflies

Information on the conservation status of butterflies within the hotspot remains limited with only 141 species so far assessed for the IUCN Red List, of which only two are considered threatened: Atewa dotted border (*Mylothris atewa*) and Tiassale liptena (*Liptena tiassale*). The former species is only known from a single area of upland evergreen forest of about 17 km^2 in Ghana in the Atewa Range, which was formerly an island within lowland forest, now largely converted to farm-bush. The main threat is from a planned large-scale bauxite strip-mine in an area covering almost all of this upland forest (Larsen 2012). The latter species is presently known only from a single locality: a very vigorous colony in Aburi Botanical Gardens, Ghana. The species was formerly more widespread and remains vulnerable to stochastic events or potential neglect within this highly restricted site (Larsen 2011).

Although only a small number of butterfly species in the hotspot have been assessed for the IUCN Red List, the wider western Africa region is reported to support nearly 1,500 butterfly species representing more than one-third of all butterflies in the Afrotropical biogeographical region (Larsen 2005). Within the hotspot, the forests of the Cameroon-Nigeria border are reported to harbor the highest forest butterfly species richness in Africa (Larsen 2005). Given the importance of the hotspot for butterflies, it is important to better understand their conservation status and the potential impacts on them of the many threats across the hotspot.

4.2.2 Freshwater Realm

The following overview of threatened species within the freshwater realm is based on the IUCN assessment of freshwater biodiversity of the western Africa region in 2009 (Smith *et al.* 2009). This assessment aimed to include information on all known, described species of freshwater fishes, odonates (dragonflies and damselflies), mollusks, crabs and selected families of aquatic plants in the region. Much of the information for the assessments of fishes is based upon the works of Lévêque *et al.* (1990, 1992) and Paugy *et al.* (2003). IUCN Red List assessments of all 25 species of freshwater shrimp were completed more recently (de Grave *et al.* 2015).

Freshwater Fishes

A comprehensive Red List assessment of freshwater fishes has been conducted across the hotspot, covering 632 species of bony fish (class: Actinopterygii). The highest densities of freshwater fish species in the hotspot are found within the Niger Delta and the Atlantic river catchments of Sierra Leone and Liberia. The Niger Delta itself has 180 recorded freshwater fish species and an additional 19 species are thought likely to be present. More than half of the freshwater fishes present are endemic to the western Africa region, but only a few species are thought to be endemic to the hotspot itself, primarily as the hotspot boundaries are largely based upon forest habitats and not river catchments, and most river systems in the hotspot originate outside its boundaries. Many species are, however, endemic to catchments crossing the hotspot. For example, *Notoglanidium akiri* is endemic to the lower Niger Delta but not to the hotspot itself, as the hotspot boundary does not include the full extent of the delta. This species, along with many others in the delta, especially the many regionally endemic killifishes, is highly threatened by pollution and habitat loss resulting from oil exploration.

Myaka myaka is a Critically Endangered fish endemic to the Barombi Mbo Crater Lake in Cameroon, where, along with 15 other fish species (12 of which are endemic to the lake), it is threatened by the expansion of palm oil plantations and slash and burn agriculture leading to sedimentation and pollution of the lake. Another Critically Endangered fish is *Barbus boboi*, a cyprinid known only from the Farmington River in Liberia, where its habitat is declining due to siltation and pollution from deforestation and mining (Entsua-Mensah 2010). In a similar situation, the Critically Endangered *Labeo curriei* is restricted to the Via River, and possibly the Corubal River, in the Saint Paul River catchment in Liberia (IUCN 2014). The threat to freshwater fishes is not only a concern in terms biodiversity loss but for its impact to local livelihoods. In western Africa the proportion of total dietary protein from fish can reach 60 percent or more (IGCC 2006), with much of this coming from inland fisheries.

Freshwater Crabs and Shrimps

Among the freshwater invertebrates assessed, the crabs and shrimps are the most highly threatened, with 16 of the 72 species in the hotspot (22 percent) assessed as threatened (IUCN 2015a). Western Africa is a centre of diversity for Africa's freshwater crabs (Cumberlidge *et al.* 2009). Two species, *Liberonautes grandbassa* and *L. lugbe*, are Critically Endangered. *L. grandbassa* is endemic to central Liberia where it is known from a single rainforest locality (Cumberlidge 2008) which is not protected. *L. lugbe* is also endemic to Liberia where it is known from only two specimens collected in Lugbe in Nimba County, where it was found in small forest streams. The freshwater shrimp, *Atya intermedia*, is an Endangered species only known from the islands of São Tomé and Annobón, where increasing tourism development is expected to result in degradation of the freshwater ecosystems on the islands, unless it is very carefully managed (de Grave 2013). Crabs and shrimps both play an important role in nutrient cycling in African freshwater ecosystems (Dobson *et al.* 2004; Cumberlidge *et al.* 2009), as they feed on dead and decaying materials such as leaves, so their ongoing decline could have a significant impact on ecosystem function.

Odonates

Odonates (dragonflies and damselflies) are a diverse group of invertebrates for which we have good information and which are also useful indicators of water quality, are numerous across the hotspot with an estimated 316 species recorded (IUCN 2015a). Sixteen species (five percent of the total) are assessed as globally threatened, of which four species are Critically Endangered. Additional surveys would surely improve our knowledge of these species and will likely lead to new discoveries. A short visit to Cameroon in 2008, for example, led to the discovery of five new species in only a few days of surveying (Kipping, pers. comm.), one of which was discovered in the building where the Red Listing workshop was being held in Yaoundé. The most important locations for further study are western Guinea, especially the Fouta Djallon Massif, and southeastern Nigeria, especially Cross River State and the Niger Delta (Djikstra *et al.* 2009). The main threats to these species are habitat loss due to agricultural expansion and deforestation, and to a lesser degree, expansion of human settlements, tourism and dams (Djikstra *et al.* 2009).

Freshwater Mollusks

Freshwater mollusks in some regions of the world are one of the most threatened groups of freshwater taxa. They remain fairly unobtrusive and are not normally considered as being charismatic creatures, so rarely attract the attention of the popular media. This is unfortunate as they are essential to the maintenance of wetland ecosystems, primarily due to their control of water quality and nutrient balance through filter-feeding and algal-grazing and, to a lesser degree, as a food source for predators including a number of fish species. Many species are also restricted to very specific microhabitats, and thus sensitive to the impacts of dams, introduction of alien species, wetland drainage and river channelization, pollution, sedimentation and siltation.

Freshwater gastropod mollusks are reasonably well known for much of western Africa. This is largely because certain species of the genera *Lymnaea* (Lymnaeidae), *Biomphalaria* and *Bulinus* (Planorbidae) act as intermediate hosts for medically important parasitic flatworms (trematodes) of humans and domestic animals (Kristensen *et al.* 2009). National surveys carried out in several countries over the past century were designed to target these genera but they also recorded other species. The results of these surveys and of other collections were collated by Brown (1980, 1994). Around 70 species have been recorded in the hotspot, of which 13 are threatened. The bivalves, with 35 species recorded from the hotspot, are not as well-known as the gastropods.

Most threatened mollusks have highly restricted ranges, and rely on clean, rapidly flowing waters. Of particular importance is the very rare, relict species *Pleiodon (Pleiodon) ovata*, which may be an ancestral species for all western African bivalves. *P. ovata* is effectively a living fossil, probably having become restricted to a single river (the Gbangbaia River in Sierra Leone) due to the disappearance of its host fish (probably a *Sindacharax* or *Alestes* species) from most of Africa (van Damme, pers comm.). From a scientific perspective, this species should be considered as a priority for further research and conservation.

Freshwater Plants
Within the freshwater realm, there is also a high diversity of aquatic plants within the hotspot, particularly in the lower Niger River, and the Red List status of a number of these species has been assessed more recently (Niang-Diop and Ouedraogo 2009). Drought and habitat loss due to expanding agriculture are the main threats identified. The most heavily threatened species is *Eriocaulon stipantepalum*, a species of pipewort (family: Eriocaulaceae) growing at the margins of small pools, which is known from just one locality in the hotspot in northern Cameroon (IUCN 2014).

4.2.3 Marine Realm

The majority of marine organisms in the Gulf of Guinea are not considered endemic to the region, due to the interconnected currents that link the Gulf of Guinea with the Canary Current to the north, and the Benguela Current coastal upwelling region to the south. Exceptions include a small number of marine fishes that are endemic to the offshore islands of São Tomé and Príncipe, and some fishes and invertebrates that are only known from a very few records in the area.

Marine Bony Fishes
Global Red List assessments have recently been published in November 2015 for all of the 650+ bony fishes (Actinopterygii) that occur in the Gulf of Guinea region as part of a larger project to assess all 1,400 deep-water and near-shore marine bony fishes in the Eastern Central Atlantic.

Based on a subset of previously the published assessments where information was sufficient to determine extinction risk, just over 11 percent of near-shore marine fishes are threatened, including several commercially important fish species, such as groupers (*Epinephelus* spp.), tunas (*Thunnus* spp.) and billfishes (*Kajikia albida* and *Makaira nigricans*). The main threats to marine fishes (see Chapter 8) are overharvesting and lack of regulation of fishing practices, especially with regard to the large offshore trawlers from the EU (Atta-Mills *et al.* 2004), China and elsewhere.

Sharks and Rays

Of the 87 species of sharks and rays assessed (representing all known described species from the region) 54 percent are threatened. Three of the five species that enter freshwater are threatened, one of which, largetooth sawfish (*Pristis pristis*), is Critically Endangered. Historical records indicate that the two sawfish species (*P. pristis* and *P. pectinata*) were once common in the estuaries of western Africa (Faria *et al.* 2013, Burgess *et al.* 2009). However, there have been recent confirmed records of these species only from Sierra Leone and only historical records from the other coastal countries in the region (Burgess *et al.* 2009). Several threatened species of guitarfishes (*Rhinobatos* spp.) inhabit shallow inland coastal waters in the region and are heavily targeted for their fins. Shark fishing has increased significantly in the past several decades and has decimated populations of many species in the region (Diop and Dossa 2011). Several rays, including the Data Deficient rosette torpedo (*Torpedo bauchotae*) and smalltooth stingray (*Dasyatis rudis*), may be endemic to the shallow, near-shore waters in the area, however very little is known of their populations, ecology or the impacts of threats.

Marine Turtles

Four species of marine turtles are present within the hotspot: green turtle (*Chelonia mydas*); hawksbill turtle (*Eretmochelys imbricate*); olive ridley turtle (*Lepidochelys olivacea*); and leatherback (*Dermochelys coriacea*). All four species are threatened by entanglement in fishing nets and from degradation and loss of nesting beaches, particularly as a consequence of coastal development (Formia *et al.* 2003). The top priority for conservation is the Critically Endangered hawksbill turtle, and action for this species within the hotspot should focus on Bioko Island of Equatorial Guinea and the islands of São Tomé and Príncipe, where the species nests regularly. Some estuarine and lagoon areas have also been identified as developmental habitat for juvenile turtles, including the Cameroon Estuary for olive ridley turtle (Fretey 2001). In areas with large turtle aggregations (such as green turtle feeding and nesting grounds in Equatorial Guinea and São Tomé and Príncipe), organized market systems have developed (Formia *et al.* 2003). Sea turtles are systematically killed both on land and sea, their nests are looted, and a lively trade in carapaces exists.

Marine Mammals

An estimated 28 species of marine mammal have been reported from the area adjacent to the hotspot of which five are threatened. Of special importance are Atlantic humpback dolphin (*Sousa teuszii*) and West African manatee, both of which inhabit the near shore coastal areas of the hotspot. The former species is endemic to the eastern tropical Atlantic, and is limited to estuarine and shallow coastal waters (Ross 202, Van Waerebeek *et al.* 2004) in depths of less than 20 meters, and has been observed to travel up the Niger and Bandiala rivers. There is historical evidence that they may currently be or may have been present in the Cameroon

Estuary. Their populations are considered to be highly fragmented, and in low numbers. There is little information on population size, diet or impact of major threats, as it is one of the least known dolphin species. As with other cetaceans, Atlantic humpback dolphin is threatened by incidental mortality in fishing nets, and is also taken directly for food. Habitat destruction, boat strikes and water pollution are additional potential threats, although little is known about them.

West African manatee is also endemic to the eastern tropical Atlantic, and is the least studied sirenian in the world. Within the hotspot, although widely distributed throughout estuaries, mangroves, rivers and inland lakes, and along the marine coastal flats, overall numbers are declining largely due to hunting and incidental catches with near extirpation in some regions (Powell and Kouadio 2008). Although hunting is illegal in several countries of the hotspot, and the species is listed in CITES Appendix II, restrictions are difficult to enforce.

4.3 Site Outcomes

4.3.1 Methodology

Many species are best conserved by protecting their habitats and the biological communities they are part of, through conservation actions at a network of sites. The method used by CEPF to identify these sites is that of KBAs, which are explicitly designed to conserve biodiversity at the greatest risk of extinction (Langhammer *et al.* 2007). The KBA methodology is data-driven, although, in data-poor regions, expert opinion also plays a critical role. All KBAs meet one or more standard criteria (Table 4.3). The KBA methodology is currently undergoing a global revision to develop a standard which is applicable to all taxonomic groups. Efforts are being made to ensure that the majority of existing KBAs, as presented here, will meet the new criteria for selection. Nevertheless, it will be necessary to re-evaluate the KBAs in future, to verify that all sites qualify under the revised criteria, and to identify additional sites of global importance of the persistence of biodiversity that are not captured under the current criteria.

Table 4.3 Criteria for Identifying KBAs in the Guinea Forest West Africa Hotspot

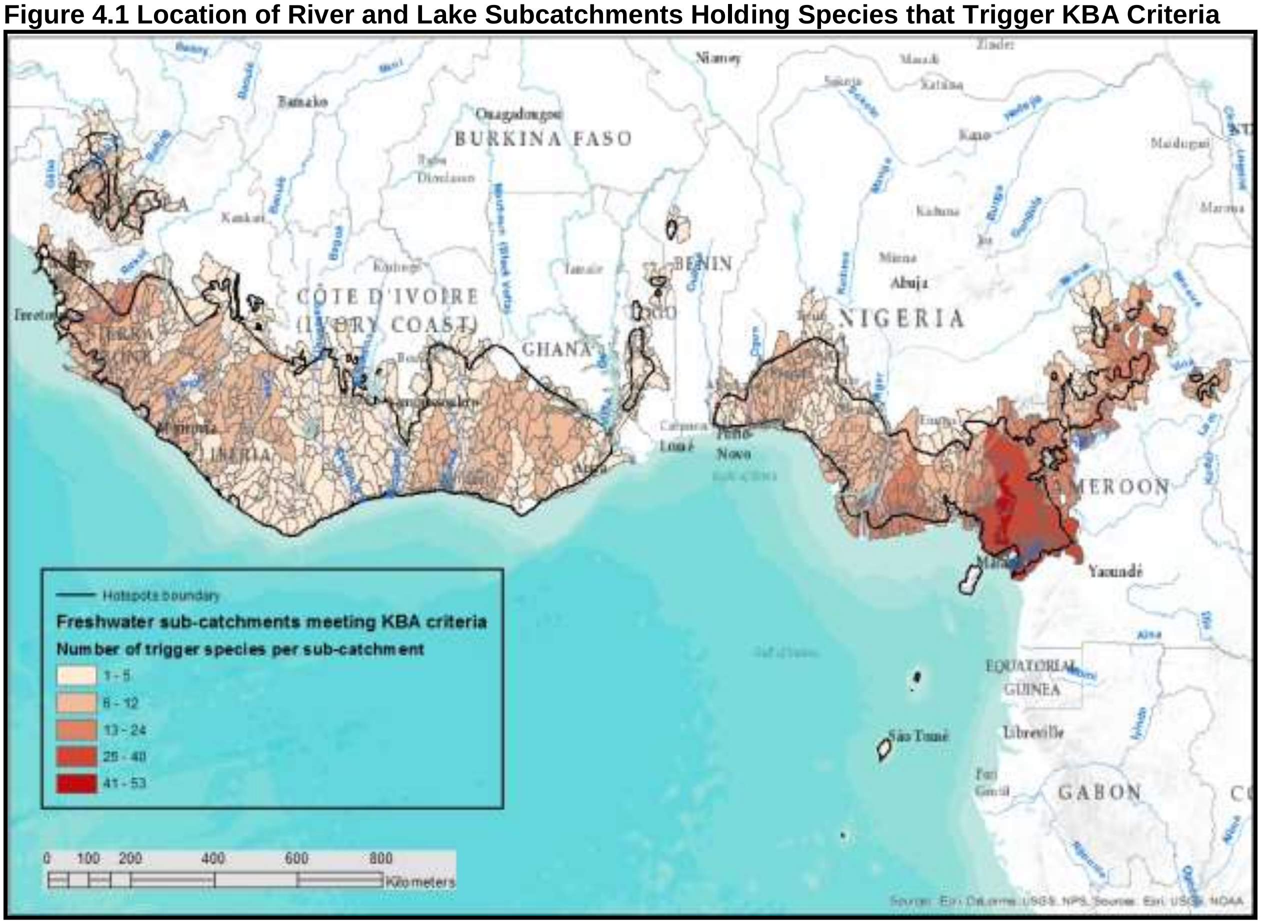
Criterion	Thresholds for Triggering KBA Status
Extinction Risk Regular occurrence of a globally threatened species at the site.	Inferred regular presence of: a) Critically Endangered (CR) species—presence of a single individual b) Endangered (EN) species—presence of a single individual c) Vulnerable (VU) species—presence of 30 individuals or 10 pairs
Range Restriction Site holds >5% of a species's global population at any stage of the species's lifecycle.	Inferred presence and sufficient extent of: a) Restricted-range species—species with a global range less than 50,000 km^2, or 5% of global population at a site b) Globally significant congregations—1% of global population seasonally at the site

Source: Langhammer *et al.* (2007).

All terrestrial KBAs analysed in this report were provided by Birdlife International through a download from the World Biodiversity Database in November 2013. Most of these terrestrial KBAs in the Guinean Forests Hotspot were originally delineated as Important Bird Areas (IBAs) by BirdLife International partner NGOs and collaborating organizations in each hotspot country, based upon the application of the KBA criteria to data on birds (Fishpool and Evans 2001). This analysis was then built upon through the identification of KBAs for multiple taxonomic groups, especially mammals, reptiles, amphibians and selected plants, by Conservation International during the first phase of CEPF investment in the Upper Guinean Forests subregion (Kouame *et al.* 2012). Finally, data were incorporated on Alliance for Zero Extinction (AZE) sites, defined as places that encompass the entire ranges of Endangered or Critically Endangered species (Ricketts *et al.* 2005).

Freshwater KBAs were determined through a separate process, as there were no data on freshwater KBAs held in the World Biodiversity Database at the time. Freshwater KBAs were identified and delineated according to river/lake subcatchments units, as the widely accepted management unit most applicable to the freshwater realm. At a spatial scale relevant to management, the hotspot area has 1,295 river/lake subcatchments within it, or straddling its borders. Almost all (1,256) of these river/lake subcatchments were identified as holding ‘trigger’ species, defined as species that meet at least one of the KBA criteria (Figure 4.1). The very large number of subcatchments that meet the KBA criteria is a product of the high levels of species endemism within catchments (a reflection of the limited dispersal options for fish and mollusk species in particular), and the high levels of threat facing freshwater species. A subset of these subcatchments (i.e. those holding the highest numbers of trigger species) were subsequently proposed as KBAs and circulated for stakeholder review.

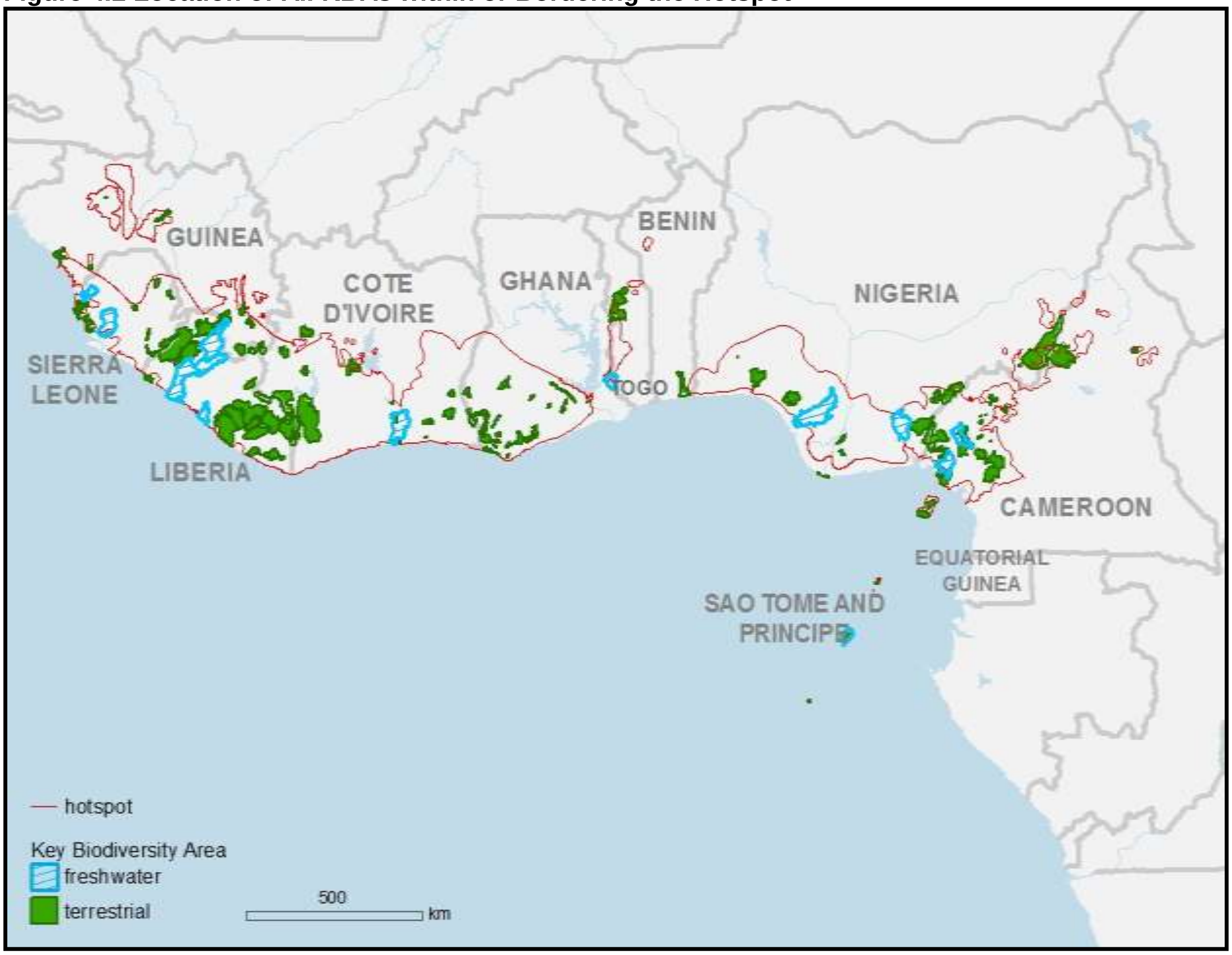
Figure 4.1 Location of River and Lake Subcatchments Holding Species that Trigger KBA Criteria



4.3.2 Identification of KBAs

A total of 137 KBAs have been identified in the hotspot (Figure 4.2). The total land area covered by these KBAs, adjusting for overlap between sites, is 109,271 km^2, slightly larger than Liberia and covering 18 percent of the entire hotspot (621,705 km^2). The KBAs have an average size of 81,152 hectares, ranging from the 159 hectare Mont Bana (CMR7) to the 586,803 hectare Gashaka-Gumpti National Park (NGA5). A summary of KBAs by country is given in Table 4.4 and the full list of KBAs is provided in Appendix 5.

Figure 4.2 Location of All KBAs within or Bordering the Hotspot



The distribution of terrestrial and freshwater KBAs is shown in more detail for each country in the hotspot in Figures 4.3 to 4.13. Terrestrial KBAs are distinguished from freshwater KBAs because site-level threats and management requirements often differ between the terrestrial and freshwater realms. In particular, freshwater KBAs need to be managed with consideration for their associated river and lake subcatchments, such that integrated river basin management approaches may be most appropriate.

The area of overlap between terrestrial and freshwater KBAs is minimal (approximately 2,000 km^2) reflecting the previously recognized spatial mismatch between areas of importance for freshwater biodiversity and the locations of terrestrial protected areas (Darwall *et al.* 2011). In most cases the overlap is incidental in that only small parts of river catchments overlap with terrestrial KBAs. Neverthless, significant areas of overlap between terrestrial and freshwater KBAs occur on the island of São Tomé, and in Cameroon, where Lake Bermin and surrounding catchments (fw2) overlaps with Bakossi Mountains (CMR1) and Banyang Mbo Wildlife Sanctuary (CMR4). In these areas, it will be of particular importance to harmonize site boundaries to ensure effective conservation management of both terrestrial and freshwater biodiversity.

Ghana has the largest number of KBAs (30 sites) but, as many of them are relatively small, the total land area (5,490 km^2) is less than for Liberia which has 22 KBAs covering a total area of 38,677 km^2 representing one-third of the total area of KBAs in the hotspot. The distribution and characteristics of KBAs within each subregion of the hotspot are discussed in some detail in the following section.

Table 4.4. Distribution of Terrestrial and Freshwater KBAs by Country

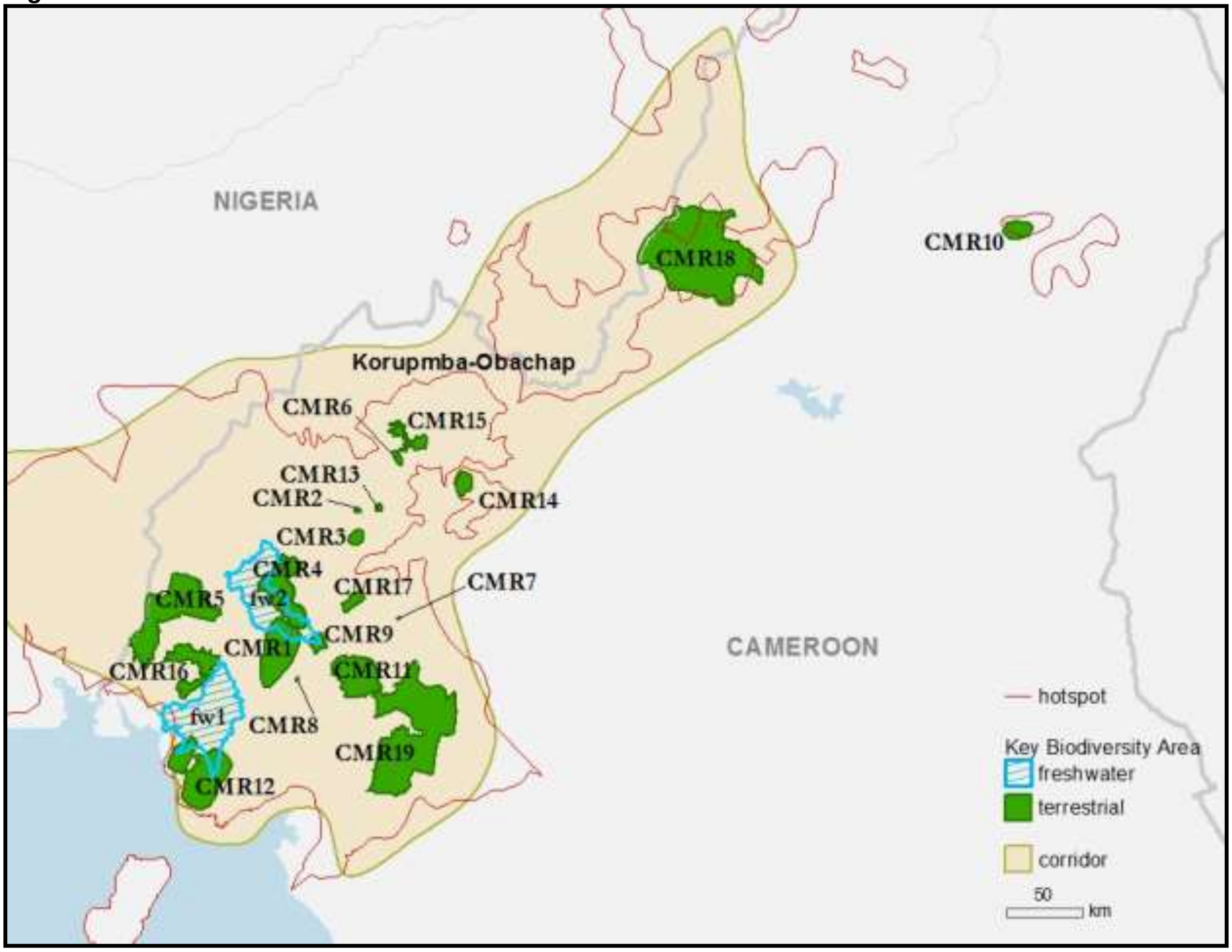
Country	KBA Area within Hotspot (sq km)[1]	Number of Terrestrial KBAs	Number of Freshwater KBAs[2]	Total Number of KBAs
Benin	984	1	0	1
Cameroon	13,837	19	2	21
Côte d'Ivoire	14,659	15	1	16
Equatorial Guinea	862	3	0	3
Ghana	5,490	30	0	30
Guinea	3,260	11	0	11
Liberia	38,677	18	4	22
Nigeria	21,231	12	2	14
São Tomé & Príncipe	961	4	1	5
Sierra Leone	6,245	9	2	11
Togo	3,065	2	1	3
Total	**109,271**	**124**	**13**	**137**

[1] The area of overlap between terrestrial and freshwater KBAs has been accounted for in these measurements.
[2] Several freshwater KBAs are transboundary and occur in more than one country. In each case, the KBA is assigned to the country with which it has the largest area of overlap.

Figure 4.3 Terrestrial and Freshwater KBAs in Benin

Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
BEN1	Lake Nokoué	Terrestrial	98,403

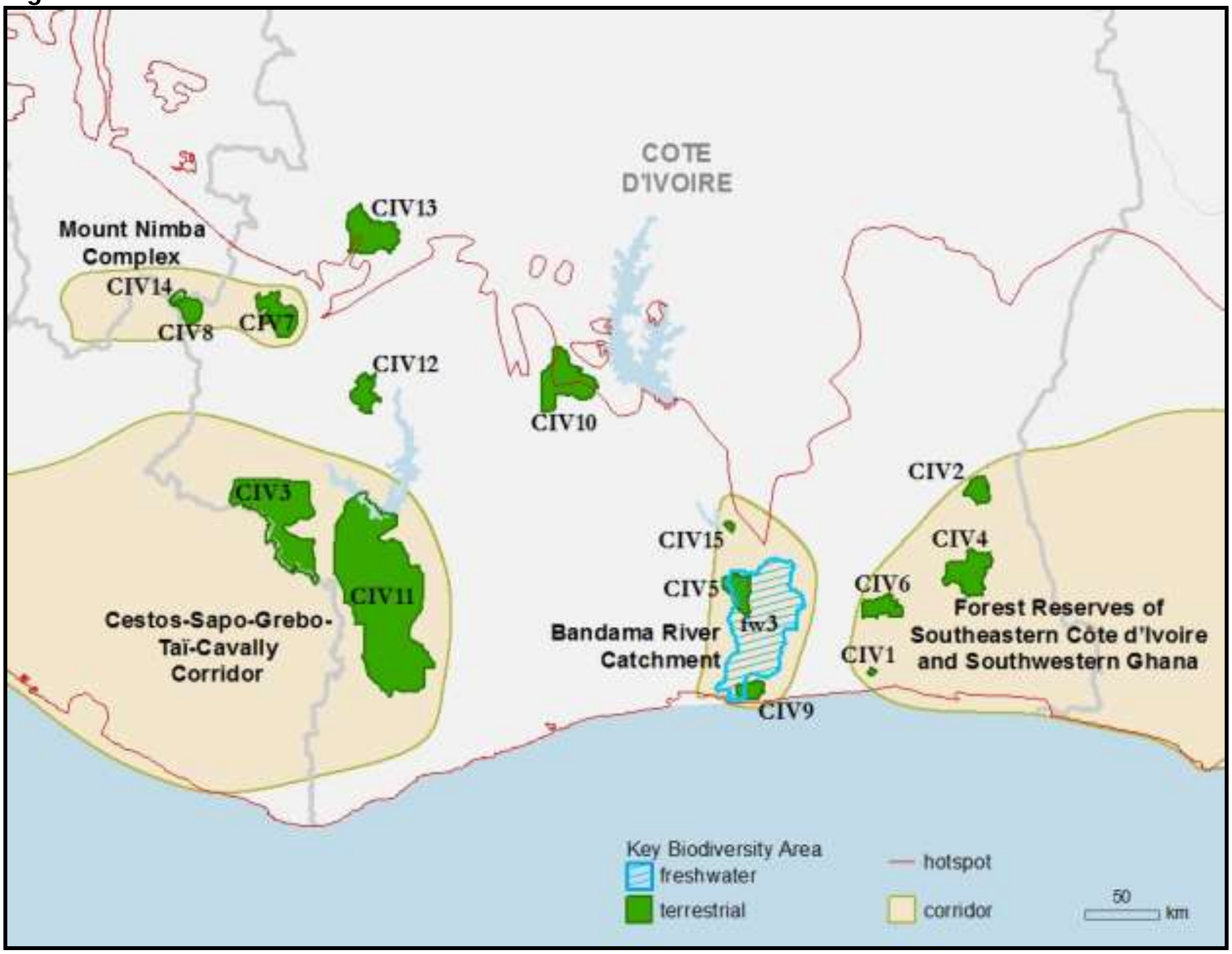
Figure 4.4 Terrestrial and Freshwater KBAs in Cameroon



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
CMR1	Bakossi Mountains	Terrestrial	75,581
CMR2	Bali-Ngemba Forest Reserve	Terrestrial	899
CMR3	Bamboutos Mountains	Terrestrial	7,396
CMR4	Banyang Mbo Wildlife Sanctuary	Terrestrial	69,145
CMR5	Korup National Park	Terrestrial	129,115
CMR6	Mbi Crater Faunal Reserve - Mbingo forest	Terrestrial	3,233
CMR7	Mont Bana	Terrestrial	159
CMR8	Mont Kupe Integral Ecological Reserve	Terrestrial	428
CMR9	Mont Manengouba	Terrestrial	8,740
CMR10	Mont Nganha	Terrestrial	16,930
CMR11	Mont Nlonako	Terrestrial	64,124
CMR12	Mount Cameroon and Mokoko-Onge	Terrestrial	107,143
CMR13	Mount Lefo	Terrestrial	1,649
CMR14	Mount Mbam	Terrestrial	13,221
CMR15	Mount Oku	Terrestrial	16,353
CMR16	Mount Rata and Rumpi Hills Forest Reserve	Terrestrial	45,200

Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
CMR17	Santchou Faunal Reserve	Terrestrial	9,506
CMR18	Tchabal Mbabo	Terrestrial	312,347
CMR19	Yabassi	Terrestrial	264,867
fw1	Lake Barombi Mbo and surrounding catchments	Freshwater	176,536
fw2	Lake Bermin and surrounding catchments	Freshwater	152,302

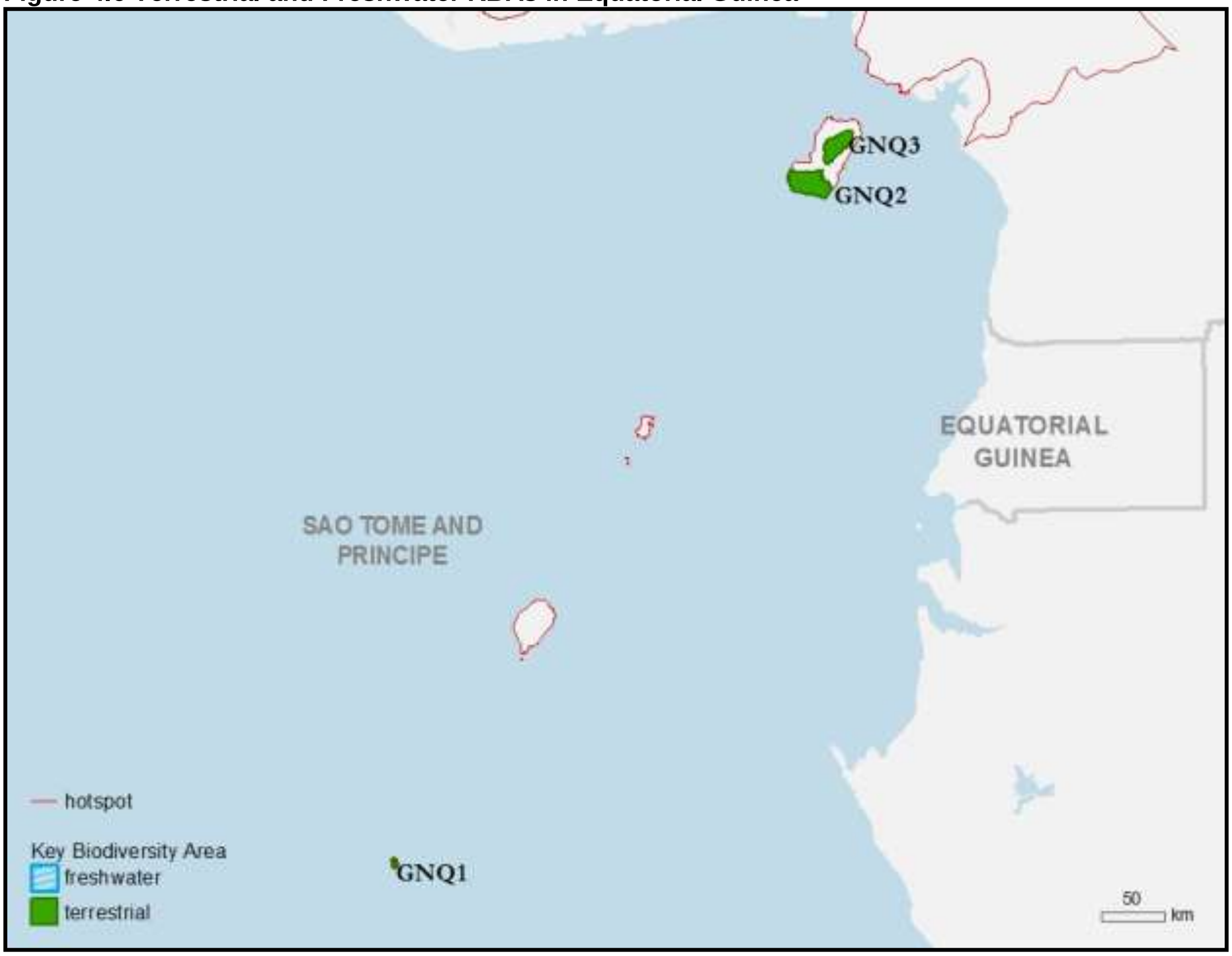
Figure 4.5 Terrestrial and Freshwater KBAs in Côte d'Ivoire



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
CIV1	Adiopodoume	Terrestrial	1,939
CIV2	Forêt Classée de Bossematié	Terrestrial	21,976
CIV3	Forêt Classée de Cavally et Goin - Débé	Terrestrial	197,925
CIV4	Forêt Classée de Mabi	Terrestrial	62,095
CIV5	Forêt Classée de Mopri	Terrestrial	32,459
CIV6	Forêt Classée de Yapo et Mambo	Terrestrial	30,598
CIV7	Forêt Classée des Mont Guéoulé et Mont Glo Réserves	Terrestrial	49,019
CIV8	Mount Nimba (part of Mount Nimba transboundary AZE)	Terrestrial	27,035

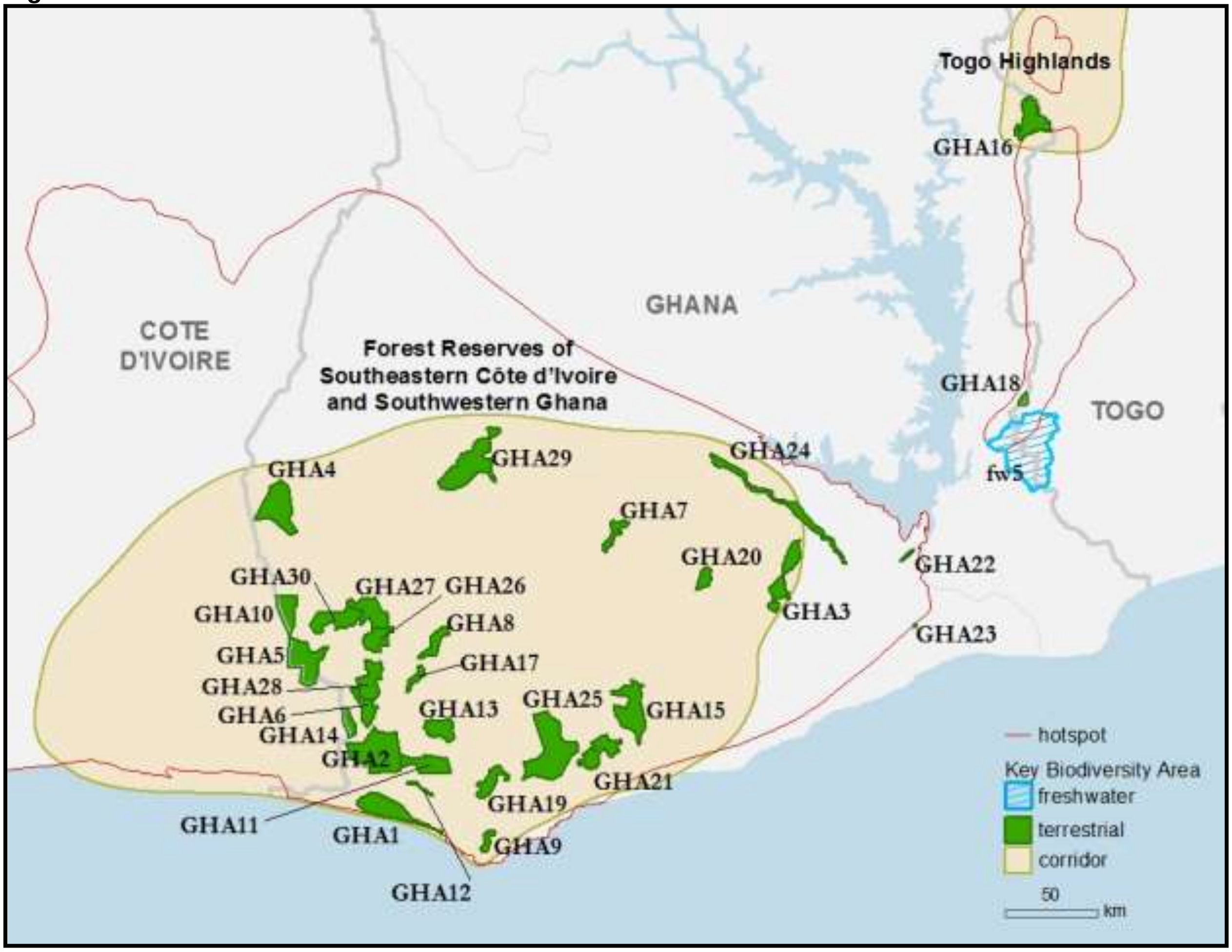
Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
CIV9	Parc National d' Azagny	Terrestrial	18,865
CIV10	Parc National de Marahoué	Terrestrial	87,526
CIV11	Parc National de Taï et Réserve de Faune du N'Zo	Terrestrial	539,376
CIV12	Parc National du Mont Péko	Terrestrial	29,330
CIV13	Parc National du Mont Sangbé	Terrestrial	75,029
CIV14	Réserve Intégrale du Mont Nimba	Terrestrial	6,480
CIV15	Station de recherche écologique de Lamto	Terrestrial	2,721
fw3	Lower Bandama River	Freshwater	315,998

Figure 4.6 Terrestrial and Freshwater KBAs in Equatorial Guinea



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
GNQ1	Annobón	Terrestrial	2,871
GNQ2	Reserva Cientifica de la Caldera de Lubá	Terrestrial	51,075
GNQ3	Parque Nacional del Pico de Basilé	Terrestrial	32,256

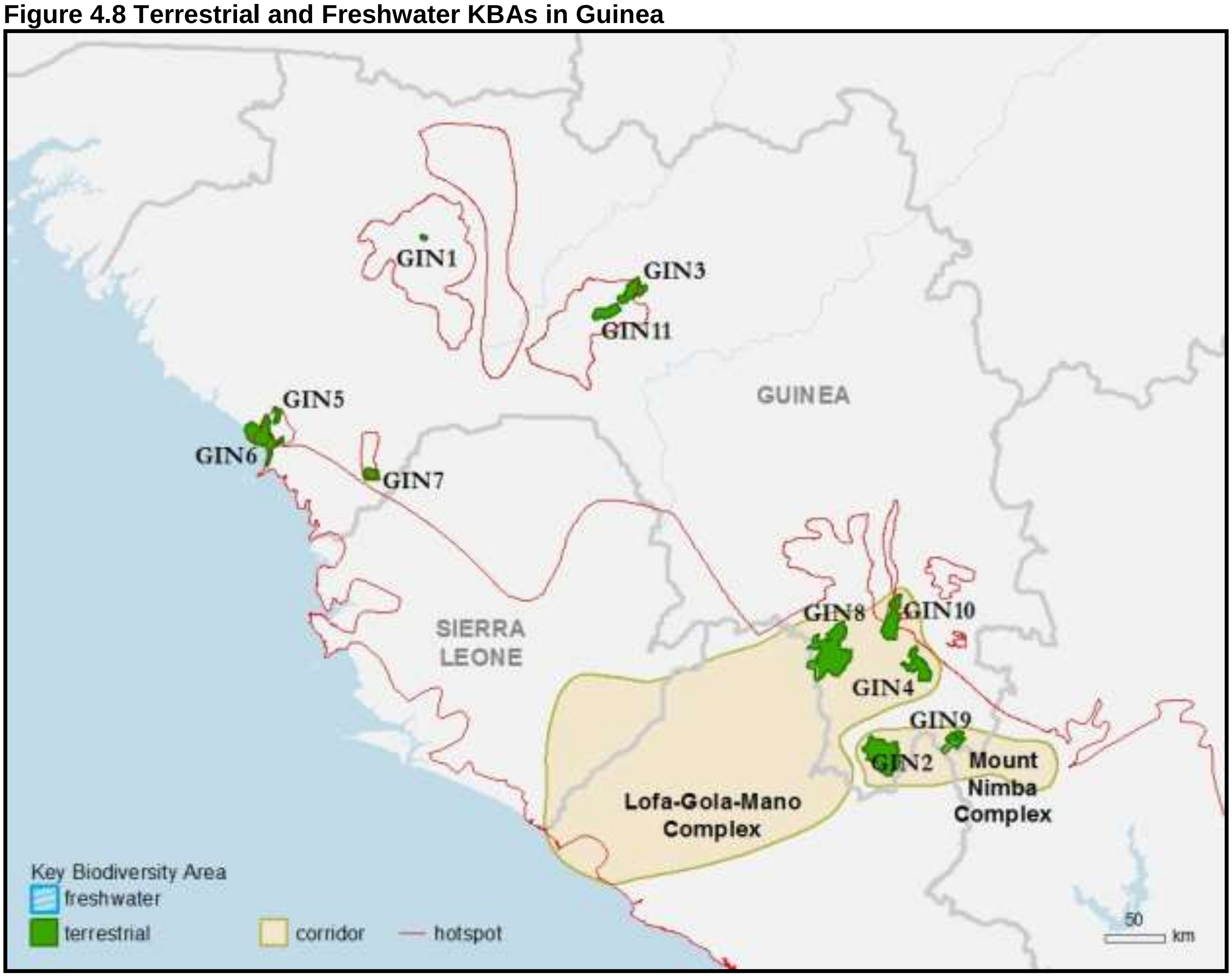
Figure 4.7 Terrestrial and Freshwater KBAs in Ghana



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
GHA1	Amansuri wetland	Terrestrial	26,751
GHA2	Ankasa Resource Reserve - Nini-Sushien National Park	Terrestrial	47,444
GHA3	Atewa Range Forest Reserve	Terrestrial	21,111
GHA4	Bia National Park and Resource Reserve	Terrestrial	34,115
GHA5	Boin River Forest Reserve	Terrestrial	30,530
GHA6	Boin Tano Forest Reserve	Terrestrial	12,181
GHA7	Bosomtwe Range Forest Reserve	Terrestrial	7,546
GHA8	Bura River Forest Reserve	Terrestrial	9,996
GHA9	Cape Three Points Forest Reserve	Terrestrial	4,545
GHA10	Dadieso Forest Reserve	Terrestrial	15,031
GHA11	Draw River Forest Reserve	Terrestrial	19,391
GHA12	Ebi River Shelterbelt Forest Reserve	Terrestrial	1,756
GHA13	Fure River Forest Reserve	Terrestrial	14,046
GHA14	Jema-Asemkrom Forest Reserve	Terrestrial	6,756
GHA15	Kakum National Park - Assin Attandaso Resource Reserve	Terrestrial	31,783
GHA16	Kyabobo (proposed) National Park	Terrestrial	21,882

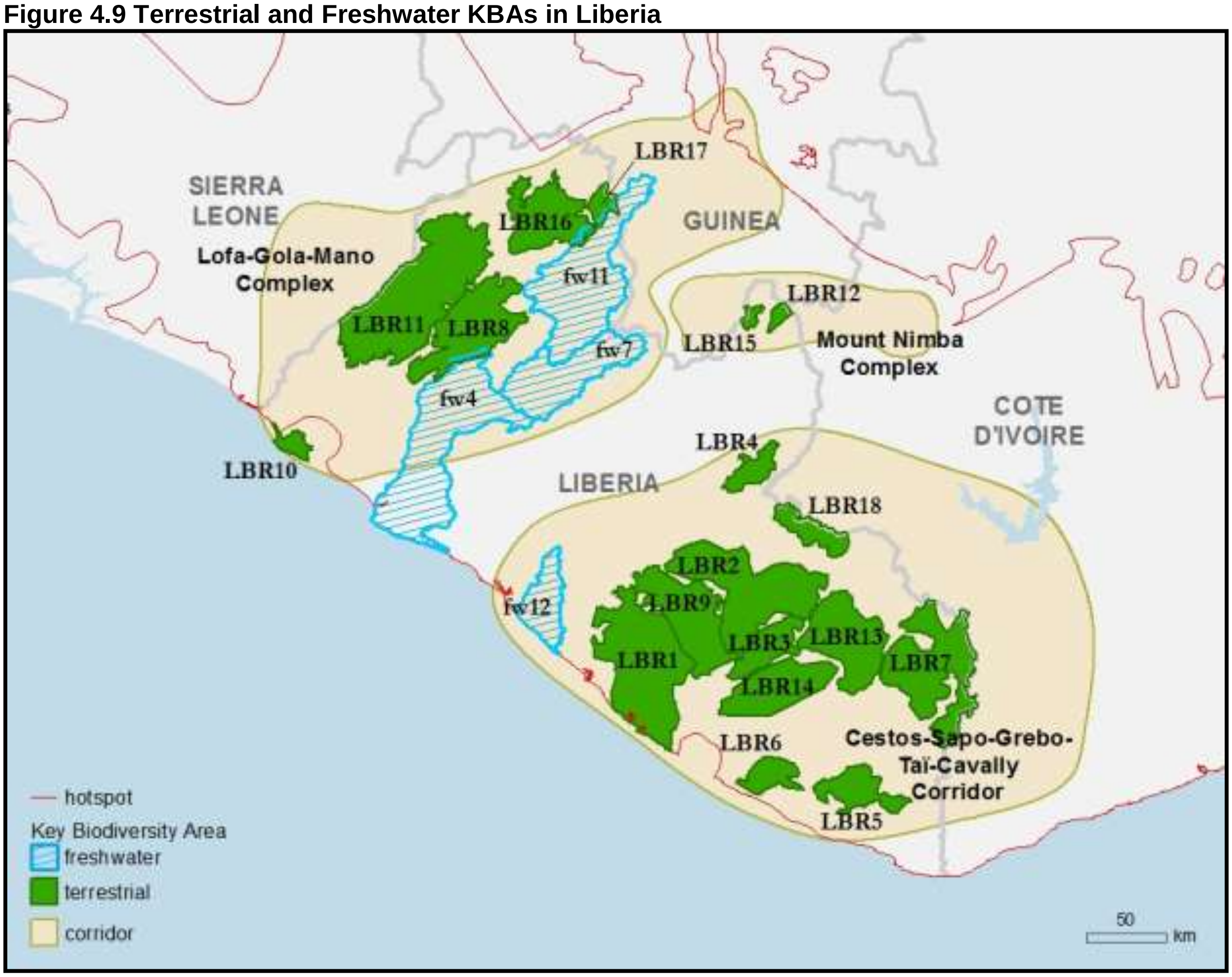
Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
GHA17	Mamiri Forest Reserve	Terrestrial	4,815
GHA18	Mount Afadjato - Agumatsa Range Forest	Terrestrial	2,185
GHA19	Neung South Forest Reserve	Terrestrial	11,974
GHA20	Nsuensa Forest Reserve	Terrestrial	6,330
GHA21	Pra-Sushien Forest Reserve	Terrestrial	18,721
GHA22	Sapawsu Forest Reserve	Terrestrial	922
GHA23	Shai Hills Game Production Reserve	Terrestrial	343
GHA24	Southern Scarp Forest Reserve	Terrestrial	24,882
GHA25	Subri River Forest Reserve	Terrestrial	55,930
GHA26	Tano-Anwia Forest Reserve	Terrestrial	14,105
GHA27	Tano-Ehuro Forest Reserve	Terrestrial	20,787
GHA28	Tano-Nimiri Forest Reserve	Terrestrial	19,026
GHA29	Tano-Offin Forest Reserve	Terrestrial	43,061
GHA30	Yoyo River Forest Reserve	Terrestrial	21,139

Figure 4.8 Terrestrial and Freshwater KBAs in Guinea



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
GIN1	Chutes de la Sala	Terrestrial	1,440
GIN2	Diécké	Terrestrial	59,232
GIN3	Forêt Classée de Balayan Souroumba	Terrestrial	22,479
GIN4	Forêt Classée de Mont Bero	Terrestrial	27,483
GIN5	Kabitaï	Terrestrial	4,970
GIN6	Konkouré	Terrestrial	45,744
GIN7	Kounounkan	Terrestrial	10,644
GIN8	Massif du Ziama	Terrestrial	91,481
GIN9	Monts Nimba	Terrestrial	14,562
GIN10	Pic de Fon	Terrestrial	32,117
GIN11	Sincery Oursa	Terrestrial	1,586

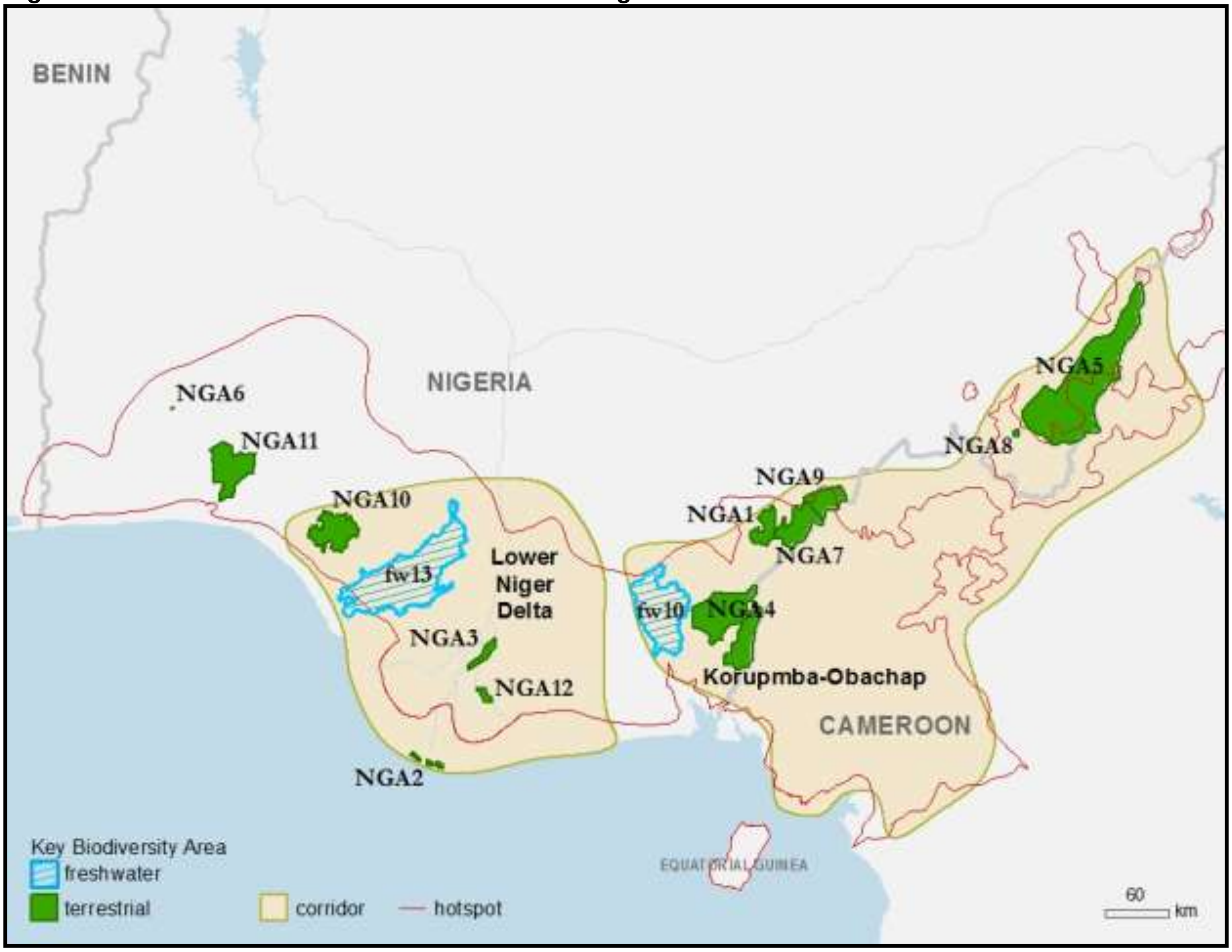
Figure 4.9 Terrestrial and Freshwater KBAs in Liberia



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
LBR1	Cestos - Senkwen	Terrestrial	350,405
LBR2	Cestos/Gbi Area	Terrestrial	316,490

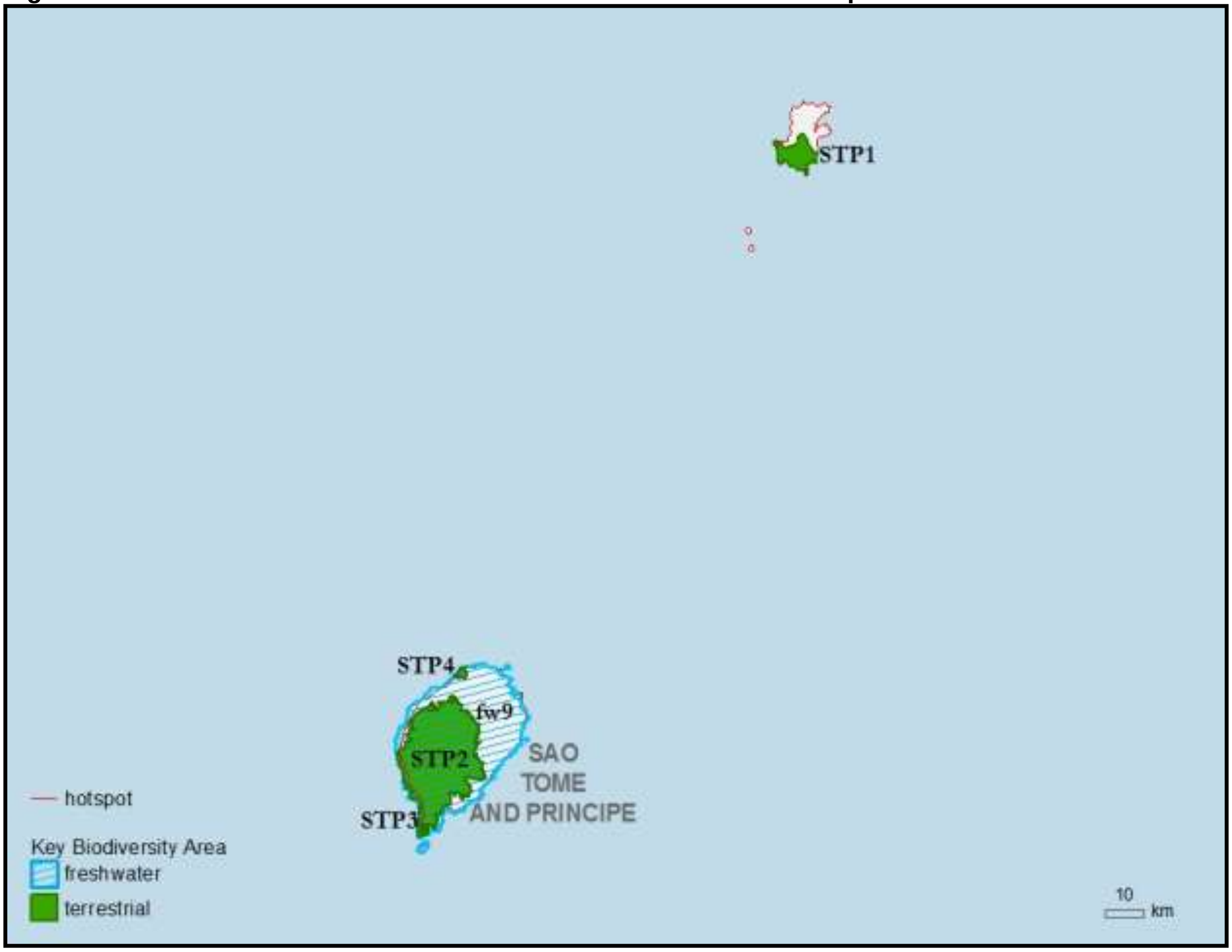
Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
LBR3	Cestos-Sapo North Corridor forest blocks	Terrestrial	81,401
LBR4	Gio National Forest	Terrestrial	48,826
LBR5	Grand Kru Southeast Forest blocks	Terrestrial	90,191
LBR6	Grand Kru Southwest blocks	Terrestrial	55,111
LBR7	Grebo	Terrestrial	282,195
LBR8	Kpelle Forest	Terrestrial	216,898
LBR9	Krahn Bassa South	Terrestrial	203,020
LBR10	Lake Piso	Terrestrial	24,859
LBR11	Lofa-Mano Complex	Terrestrial	437,854
LBR12	Nimba mountains	Terrestrial	13,254
LBR13	Sapo - Grebo Corridor	Terrestrial	197,421
LBR14	Sapo National Park	Terrestrial	155,084
LBR15	West Nimba	Terrestrial	11,625
LBR16	Wologizi mountains	Terrestrial	167,985
LBR17	Wonegizi mountains	Terrestrial	28,868
LBR18	Zwedru	Terrestrial	64,458
fw4	Lower reaches of St Paul River	Freshwater	350,405
fw7	Middle reaches of St Paul River	Freshwater	316,490
fw11	Upper reaches of St Paul River	Freshwater	81,401
fw12	Weeni creek - Grand Bassa County	Freshwater	48,826

Figure 4.10 Terrestrial and Freshwater KBAs in Nigeria



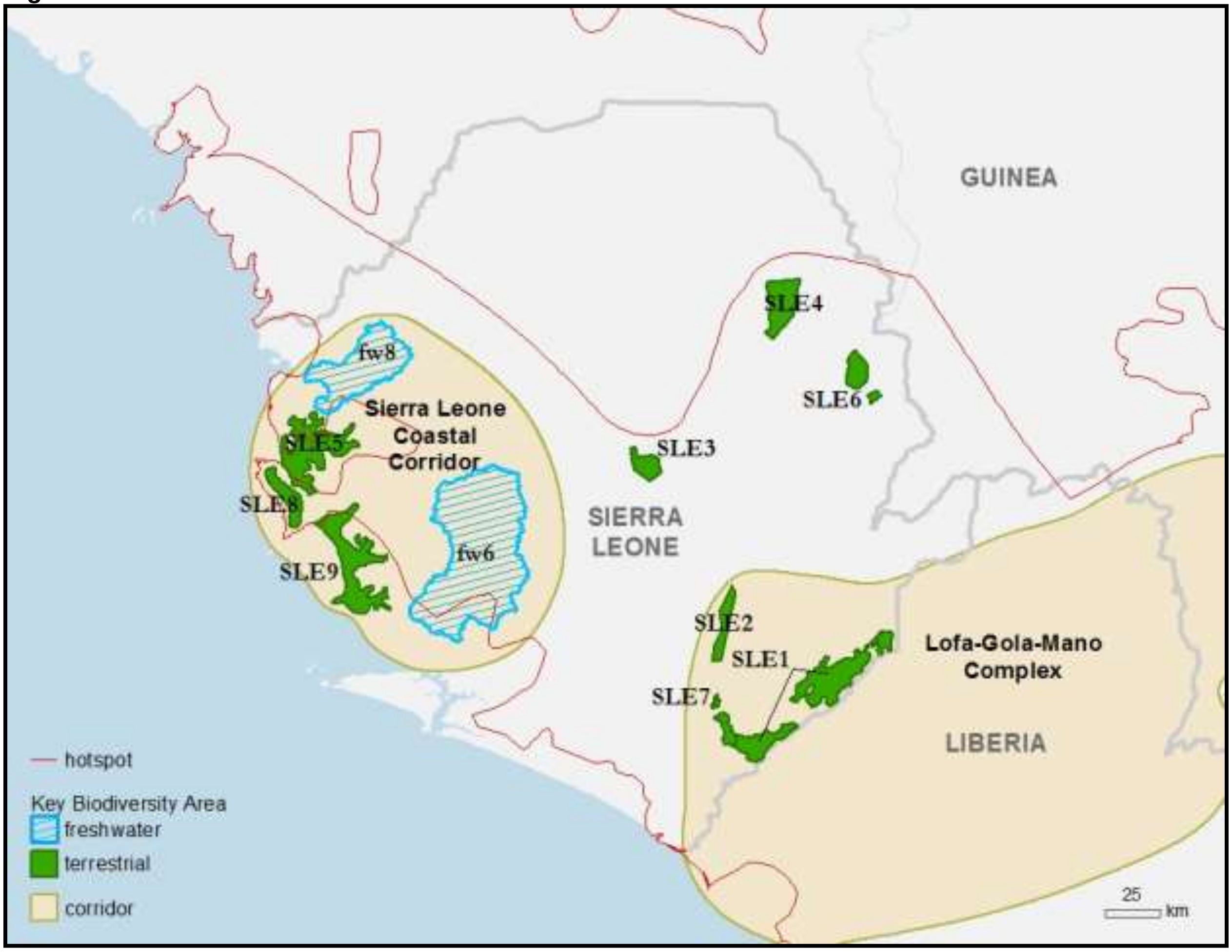
Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
NGA1	Afi River Forest Reserve	Terrestrial	51,975
NGA2	Akassa Forests	Terrestrial	8,333
NGA3	Biseni forests	Terrestrial	21,619
NGA4	Cross River National Park: Oban Division	Terrestrial	268,952
NGA5	Gashaka-Gumti National Park	Terrestrial	586,803
NGA6	IITA Forest Reserve, Ibadan	Terrestrial	327
NGA7	Mbe Mountains and Cross River National Park: Okwangwo Division	Terrestrial	95,288
NGA8	Ngel-Nyaka Forest Reserve	Terrestrial	3,004
NGA9	Obudu Plateau	Terrestrial	70,743
NGA10	Okomu National Park	Terrestrial	111,626
NGA11	Omo Forest Reserve	Terrestrial	131,908
NGA12	Upper Orashi forests	Terrestrial	9,883
fw10	South East Niger Delta - near Calabar	Freshwater	269,451
fw13	West Niger Delta	Freshwater	493,149

Figure 4.11 Terrestrial and Freshwater KBAs in São Tomé and Príncipe



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
STP1	Parque Natural Obô do Príncipe	Terrestrial	5,670
STP2	Parque Natural Obô de São Tomé e Zona Tampão	Terrestrial	44,830
STP3	Zona Ecológica dos Mangais do Rio Malanza	Terrestrial	229
STP4	Zona Ecológica da Praia das Conchas	Terrestrial	522
fw9	São Tomé	Freshwater	90,467

Figure 4.12 Terrestrial and Freshwater KBAs in Sierra Leone



Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
SLE1	Gola Forest Reserve	Terrestrial	74,612
SLE2	Kambui Hills Forest Reserve	Terrestrial	14,012
SLE3	Kangari Hills Non-hunting Forest Reserve	Terrestrial	11,743
SLE4	Loma Mountains Non-hunting Forest Reserve	Terrestrial	26,782
SLE5	Sierra Leone River Estuary	Terrestrial	55,823
SLE6	Tingi Hills Non-hunting Forest Reserve	Terrestrial	14,293
SLE7	Tiwai Island Game Sanctuary / Non-hunting Forest Reserve	Terrestrial	1,251
SLE8	Western Area Peninsula Non-hunting Forest Reserve	Terrestrial	16,414
SLE9	Yawri Bay	Terrestrial	54,674
fw6	Gbangbaia River Basin	Freshwater	266,478
fw8	Rhombe Swamp and Mouth of Little and Great Scarcies Rivers	Freshwater	88,460

Figure 4.13 Terrestrial and Freshwater KBAs in Togo

Code	Key Biodiversity Area	Terrestrial or freshwater	Area (hectares)
TGO1	Fazao-Malfakassa National Park	Terrestrial	215,337
TGO2	Missahoe Forest Reserve	Terrestrial	1,225
fw5	Lower Volta eastern catchment	Freshwater	91,184

As no Important Plant Areas (IPAs) had been identified for the hotspot at the time of the ecosystem profiling exercise, most of the terrestrial KBAs designated for plants were largely based on the presence of threatened or restricted-range species of terrestrial flowering plants. A small number of freshwater aquatic plants trigger freshwater KBAs (see below) but only for the few families assessed to date. Given the importance of this hotspot for its forest habitats, expansion of IUCN Red List coverage for forest plants and subsequent identification of KBAs for plants is a priority. For example, there are currently no KBAs identified for orchids (family: Orchidaceae), many of which are known to be highly threatened and/or range restricted, and none were proposed during the stakeholder consultations. A number of terrestrial and freshwater KBAs incorporate coastal habitats but in the offshore marine realm adjacent to the hotspot, with the exception of several coastal IBAs for seabirds, no marine KBAs have yet been identified. It is worth noting, however, that the Cross River Estuary, which is shared between Nigeria and

Cameroon, is the biggest estuary in the Gulf of Guinea and has recently been proposed as a candidate ’Ecologically or Biologically Sensitive Marine Area’. Although the biodiversity in this mangrove area is not well-documented, it is believed to be rich in biodiversity. The mangrove habitat is relatively untouched, with exploitation as the only source of significant human impact (Nwosu 2005). The process for identifying and delineating freshwater KBAs, based on those subcatchments identified as holding trigger species, has only just begun and only 13 freshwater KBAs were identified during the ecosystem profiling process, representing a selection of the highest priority sites.

4.3.3 Prioritization of KBAs Based on Relative Biological Importance

It is not possible for CEPF to fund conservation actions at all of the 137 KBAs identified within the hotspot during a single investment phase. Consequently, a subset of priority sites was identified as those considered most likely to benefit from the financial resources available through CEPF investments during the next five years.

The first step was to prioritize among KBAs based upon their relative biological importance, following the protocol described in Langhammer *et al.* (2007). It is important to stress here that this is an exercise in prioritization among sites that are all of global importance for the persistence of biodiversity, and that the priority scores thereby assigned are relative.

Each terrestrial KBA was assigned a total score for relative biological importance, based upon criteria of irreplaceability and vulnerability (Table 4.5).

1) *Species-based Irreplacability*. Each trigger species (defined as a species present which meets one or more of the KBA criteria) was given an irreplaceability score calculated from the number of confirmed and proposed KBAs within the hotspot where the species is thought to be present. This reflects the number of spatial options for conservation action for the species within the KBA network for the hotspot.

2) *Species-based Vulnerability*. Each trigger species was assigned a vulnerability score, based on the global threat status of the species, following the IUCN Red List Categories. This score reflects the likelihood that a species will go extinct in the near future if no conservation actions are taken.

3) *Site Vulnerability*. The vulnerability of the KBA holding the trigger species was scored according to the current level of spatial overlap with existing protected areas classified as IUCN Categories I-IV. It is, however, recognised that this is not always a true reflection of the actual protection a site receives but it is used here as a basic surrogate for the level of current site protection.

Table 4.5 Criteria Used to Assign Species-based Irreplaceability, Species-based Vulnerability and Site Vulnerability Scores to KBAs

Species-based Irreplaceability Score	Number of KBAs where Present within the Hotspot	Species-based Vulnerability Score	Global Threat Status (i.e., IUCN Red List Category)	Site Vulnerability Score	Overlap of KBA with Protected Areas[2]
Extreme	Single site only	Extreme	CR		
High	<= 10 sites	High	EN	High	<25%
Medium	<=100 sites	Medium	VU	Medium	25-75%
Low	>100 sites or “not known”[1]	Low	NT; LC; DD	Low	>75%

[1] This applies to most plant species for which distribution ranges are yet to be mapped.
[2] In IUCN Protected Area Categories I to IV only.

Finally, a priority score was assigned to each species-site combination based upon a combination of all three criteria, and each KBA site was assigned to the highest priority ranking it triggered (Table 4.6). For example, sites with extreme irreplaceability for CR or EN species are the highest priorities for conservation action. These Priority 1 sites also qualify as AZE sites, although not all are currently recognized as such on www.zeroextinction.org/.

Table 4.6 Matrix Used to Assign Priority Scores to Species-site Combinations

Species-based Irreplaceability	Species-based Vulnerability	Site-based Vulnerability		
		High	Medium	Low
Extreme	Extreme	1	1	1
	High	1	1	1
	Medium	2	3	4
	Low	3	4	5
High	Extreme	2	2	3
	High	2	3	4
	Medium	3	4	5
	Low	4	5	5
Medium	Extreme	4		
	High	4		
	Medium	5		
	Low	5		
Low	Extreme	4		
	High	5		
	Medium	5		
	Low	5		

On completion of this prioritisation exercise, all terrestrial KBAs and their associated trigger species were screened to ensure the top priority sites had been ranked correctly. In particular, given the heavy weighting of the final priority KBA ranking to species irreplaceability, the scores were checked for highly threatened species that are on the edge of their range within the hotspot but widespread elsewhere. In cases of marginal occurrence, the species irreplaceability score was downgraded and the KBA was assigned a different priority score for that species-site combination.

A number of other sites were omitted because the trigger species leading to the site being ranked as a Priority 1 KBA were found, on closer investigation, to be possibly extinct at the site or based only on a single historical record. Adiopodoume KBA (CIV1), for example, was omitted from the Priority 1 KBA list as its priority 1 ranking was based upon the presence of the Critically Endangered Wimmer's shrew (*Crocidura wimmeri*), which has not been recorded since 1976.

KBAs triggered through the presence of threatened and apparently restricted-range plants were also omitted or downgraded where the species was found to be quite widespread within and beyond the hotspot, as is often the case where species distribution maps are not available (e.g. for almost all plant species considered here). Finally, in a few cases, the Red List status of a KBA trigger species had changed since the original data download from the IUCN Red List in November 2013, leading to an updating of the species vulnerability score. For example, Parc National du Mont Péko (CIV12) was initially ranked as a Priority 1 KBA due to the presence of *Bobgunnia fistuloides* but this species has recently been downlisted from Endangered to Least Concern, meaning that the KBA no longer qualifies as a Priority 1 site.

The freshwater river/lake subcatchments were scored against the same criteria as described above but with some differences, in accordance with the procedures proposed by Holland *et al*. (2012). Species irreplaceability was scored against species range size according to the thresholds given in Tables 4.7 and 4.8 below. Higher range size thresholds were set for odonates (dragonflies and damselflies), as they tend to disperse more widely than other freshwater taxa.

Table 4.7 Criteria Used to Assign Species-based Irreplacability Scores to Odonates

Irreplacability Score	Range Size
Extreme	Site holds a species with a range size <2,000 km^2
High	Site holds a species with a range size >2,000 km^2 and <5,000 km^2
Medium	Site holds a species with a range size >5,000 km^2 and <50,000 km^2
Low	Site holds a species with a range size >50,000 km^2

Table 4.8 Criteria Used to Assign Species-based Irreplacability Scores to Other Freshwater Taxa

Irreplacability Score	Range Size
Extreme	Site holds a species with a range size <2,000 km^2
High	Site holds a species with a range size >2,000 km^2 and <5,000 km^2
Medium	Site holds a species with a range size >5,000 km^2 and <20,000 km^2
Low	Site holds a species with a range size >20,000 km^2

For the purposes of this profile, only a small number of the highest priority freshwater sites were identified as KBAs through stakeholder feedback. Further work is needed to identify the full suite of freshwater KBAs in the Guinean Forests Hotspot. The results of the biological prioritization of terrestrial and freshwater KBAs in each hotspot country are given in Table 4.9.

Table 4.9 Terrestrial and Freshwater KBAs by Priority Score and Country

Priority Score	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea	Ghana	Guinea	Liberia	Nigeria	São Tomé & Príncipe	Sierra Leone	Togo	Total Number of KBAs
Terrestrial KBAs												
1	0	12	0	2	0	1	1	0	3	2	0	21
2	0	4	6	0	12	2	7	6	1	4	1	43
3	1	1	2	1	5	6	4	3	0	1	0	24
4	0	2	7	0	7	2	6	2	0	2	1	29
5	0	0	0	0	6	0	0	1	0	0	0	7
Total	**1**	**19**	**15**	**3**	**30**	**11**	**18**	**12**	**4**	**9**	**2**	**124**
Freshwater KBAs												
1	0	2	0	0	0	0	2	0	1	1	0	6
2	0	0	1	0	0	0	2	2	0	1	1	7
Total	**0**	**2**	**1**	**0**	**0**	**0**	**4**	**2**	**1**	**2**	**1**	**13**

Note: Some KBAs are transboundary and are counted for each of the countries into which they extend.

Those species triggering Priority 1 ranking of all terrestrial KBAs are shown in Table 4.10. Mammal trigger species are almost all small-sized, restricted-range species, such as shrews, mongoose and bats. This is driven by the high importance placed on irreplaceability.

Table 4.10 Species Triggering Priority 1 Terrestrial KBAs on the Basis of Relative Biological Importance

Priority 1 KBA	Country	Species triggering Priority 1 status	Common name	Class	Red List Category
Annobón	Equatorial Guinea	*Afroablepharus annobonensis*	Annobón lidless skink	Reptilia	CR
Bakossi Mountains	Cameroon	*Hyperolius dintelmanni* *Leptodactylodon wildi*	N/A N/A	Amphibia Amphibia	EN EN
Bamboutos Mountains	Cameroon	*Leptodactylodon axillaris*	N/A	Amphibia	EN
Gola Forest Reserve	Sierra Leone	*Hylomyscus baeri*	Baer's wood mouse	Mammalia	EN
Konkouré	Guinea	*Rhinolophus maclaudi*	Maclaud's horseshoe bat	Mammalia	EN
Mbi Crater Faunal Reserve - Mbingo forest	Cameroon	*Crocidura picea*	Cameroonian shrew	Mammalia	CR
Mont Kupe Integral Ecological Reserve	Cameroon	*Werneria preussi*	N/A	Amphibia	EN
Mont Manengouba	Cameroon	*Cardioglossa trifasciata* *Leptodactylodon erythrogaster*	N/A N/A	Amphibia Amphibia	CR CR
Mont Nganha	Cameroon	*Astylosternus nganhanus*	N/A	Amphibia	CR
Mont Nlonako	Cameroon	*Petropedetes perreti* *Cardioglossa venusta* *Astylosternus perreti*	N/A N/A N/A	Amphibia Amphibia Amphibia	EN EN EN
Mount Cameroon and Mokoko-Onge	Cameroon	*Pternistis camerunensis* *Sylvisorex morio* *Otomys burtoni*	Mount Cameroon francolin Mount Cameroon forest shrew Burton's vlei rat	Aves Mammalia Mammalia	EN EN EN
Mount Lefo	Cameroon	*Lophuromys eisentrauti*	Mount Lefo brush-furred mouse	Mammalia	EN

Priority 1 KBA	Country	Species triggering Priority 1 status	Common name	Class	Red List Category
Mount Oku	Cameroon	*Hylomyscus grandis* *Lamottemys okuensis* *Lophuromys dieterleni* *Wolterstorffina chirioi* *Xenopus longipes*	Mt Oku hylomyscus Mt Oku rat Mt Oku brush-furred rat N/A Lake Oku clawed frog	Mammalia Mammalia Mammalia Amphibia Amphibia	CR EN EN CR CR
Mount Rata and Rumpi Hills Forest Reserve	Cameroon	*Myosorex rumpii* *Alexteroon jynx*	Rumpi mouse shrew N/A	Mammalia Amphibia	EN CR
Parque Natural Obô do Príncipe	São Tomé & Príncipe	*Turdus xanthorhynchus*	Príncipe thrush	Aves	CR
Parque Natural Obô de São Tomé e Zona Tampão	São Tomé & Príncipe	*Myonycteris brachycephala* *Columba thomensis* *Neospiza concolor*	São Tomé collared fruit bat São Tomé olive-pigeon São Tomé grosbeak	Mammalia Aves Aves	EN EN CR
Parque Nacional del Pico de Basilé	Equatorial Guinea	*Praomys morio*	Cameroon soft-furred mouse	Mammalia	EN
Tchabal Mbabo	Cameroon	*Cardioglossa alsco*	N/A	Amphibia	CR
Western Area Peninsula Non-hunting Forest Reserve	Sierra Leone	*Cardioglossa aureoli* *Triclisia macrophylla*	Freetown long-fingered frog N/A	Amphibia Magnoliopsida	EN CR
Zona Ecológica da Praia das Conchas	São Tomé & Príncipe	*Chaerephon tomensis*	São Tomé free-tailed bat	Mammalia	EN
Zwedru	Liberia	*Phyllastrephus leucolepis*	Liberian greenbul	Aves	CR

Notes: All species listed have only been recorded within a single KBA within the hotspot. All KBAs listed meet the criteria for AZE sites.

4.3.3 Overview of KBAs Ranked as High Relative Biological Importance

Upper Guinean Forests Subregion

The Upper Guinean Forests subregion of the hotspot has 36 terrestrial and eight freshwater KBAs of high relative biodiversity value (Priority 1 and 2). Four of these sites meet the criteria for AZE sites: Gola Forest Reserve (SLE1); Konkouré (GIN6); Western Area Peninsula Non-hunting Forest Reserve (SLE8); and Zwedru (LBR 18) (Table 4.10). Only Zwedru is listed as an AZE site on the Alliance’s website, which also recognizes two other AZE sites in the Upper Guinean Forests. The former, Parc National de Taï et Réserve de Faune du N’Zo (CIV11), was formerly considered to be the only site for Taï toad but this species has recently been found at a second site (Gola Forest Reserve (SLE1)) and downlisted from Critically Endangered to Endangered. The latter site, Mount Nimba, is a transboundary AZE site, spanning Côte d’Ivoire, Guinea and Liberia, which supports the entire global population of the Critically Endangered Mount Nimba viviparous toad. In the analysis used for the ecosystem profile, Mount Nimba is divided among several KBAs, none of which supports the entire population of this species. Consequently, none of them qualified as Priority 1 KBAs.

Central and Western Guinea

In Central and Western Guinea, there are two KBAs of high relative biological importance. Forêt Classée de Balayan Souroumba (GIN3) is ranked highly for the potential presence of the Endangered white-backed vulture and the presence of chimpanzees and a number of plant species of conservation concern. Konkouré (GIN6), a Priority 1 site near to Conakry on the coast of Guinea, is important for the Endangered Maclaud's horseshoe bat (*Rhinolophus maclaudi*), which is known from very few localities in Guinea, one of which is Conakry Island. This site, which encompasses some important mangrove habitat, is also potentially important for West Africa manatee and many near-shore marine species, including two species of Critically Endangered sawfishes.

Coastal Sierra Leone

Further south along the coast around Freetown in Sierra Leone is a cluster of Terrestrial KBAs, including the Western Area Peninsula Non-Hunting Forest Reserve (SLE8), Yawri Bay (SLE9), and Sierra Leone River Estuary (SLE5). The former site contains the only remaining patch of tropical rainforest in western Sierra Leone and is an important site for many bird species, including five species of global conservation concern. The site also supports a number of primate species, including the Endangered chimpanzee and the Vulnerable Diana monkey. Three species of duiker, including the Endangered Jentink's duiker, are also found at the site, as well as the Endangered Freetown long-fingered frog (*Cardioglossa aureoli*). Yawri Bay KBA, important for numerous bird species, West African manatee, marine turtles, and chimpanzee, has recently been described as being at high threat from agricultural expansion, mining and road construction (BirdLife International 2015). Sierra Leone River Estuary KBA is another site of potential importance for shorebirds, manatees, sawfishes and turtles.

Two freshwater KBAs are located in coastal Sierra Leone. Rhombe Swamp and Mouth of Little and Great Scarcies Rivers (fw8) holds three globally threatened species of freshwater fish, one threatened mollusk and two threatened odonates. The second site, Gbangbaia River Basin (fw6), holds six globally threatened fish species and two threatened dragonflies. It is also believed to be the only remaining site for the very rare, relict species of mollusk *Pleiodon ovate*, which is thought to be the ancestral species for the western Africa bivalves.

Sierra Leone-Liberia-Guinea Transboundary Area

A little further south and inland near the Sierra Leone-Liberia-Guinea border is a highly important transboundary complex of KBAs, which includes Gola Forest Reserve (SLE1), Kambui Hills Forest Reserve (SLE2), Tiwai Island Game Sanctuary/Non-hunting Forest Reserve (SLE7), Lofa-Mano Complex (LBR11), the Wologizi Mountains (LBR16) and Massif du Ziama (GIN8). Tiwai Island Sanctuary in the Moa River, Sierra Leone, has one of the highest densities of primate species remaining in Africa including the Endangered western red colobus (*Procolobus badius*), Vulnerable Diana monkey, Endangered chimpanzee, and Vulnerable black-and-white colobus (*Colobus polykomos*). More than 176 bird species, including the Vulnerable Rufous fishing owl (*Scotopelia ussheri*), 700 butterfly species and 700 plant species have been recorded on Tiwai (T. Garnet pers. comm.). Gola Forest Reserve holds the largest area of rainforest in the Upper Guinean Forests Subregion of Sierra Leone, with a very high diversity of species including 14 bird species of conservation concern. The KBA also supports many primates, and a number of large mammals such as the African elephant, pygmy hippo and Jentink's duiker. This site is also home to a disjunct population of the Endangered Baer's wood mouse (*Hylomyscus baeri*). Lofa-Mano Complex, across the border in Liberia, is contiguous with Gola Forest Reserve. The KBA is situated between the Lofa and Mano rivers covering a large area of rainforest and a patch of savanna. It supports populations of chimpanzee, duikers, monkeys and African elephant. This KBA is considered to be in danger due to the very high current threat from agricultural expansion, mining, and residential and urban development.

Immediately to the southeast of this transboundary complex of KBAs, there are three high priority freshwater KBAs. A KBA in the Upper reaches of St Paul River (fw11) is important for the high concentration of globally threatened freshwater species including eight fish species and also the Endangered treehole crab, *Globonautes macropus*. *Barbus carcharhinoides* and *B. melanotaenia* are both Critically Endangered fish species thought to be globally restricted to this upper section of the river. The Critically Endangered gastropod mollusk, *Bellamya liberiana*, is also potentially found in this part of the river and could benefit from additional survey effort. Downstream of the Upper reaches of St Paul River are two other freshwater KBAs: Middle reaches of St Paul River (fw7); and Lower reaches of St Paul River (fw4).

Mount Nimba Area

Moving east across the subregion, one finds a complex of adjacent and overlapping KBAs in the Mount Nimba area, which spans the borders of Liberia, Guinea and Côte d'Ivoire. This relatively isolated range of steeply sloping and heavily forested mountains is extremely rich in biodiversity, including many species endemic to the area. The diversity and density of tree ferns, such as *Cyathea cylindricus*, is notable. The mountains are identified as an AZE site on account of three species of amphibian, as well as Lamotte's roundtail bat (*Hipposideros lamottei*), which are all threatened and restricted to the area. The Mount Nimba area is divided among five KBAs, two of which were ranked as high biological priorities: Mount Nimba (part of Mount Nimba transboundary AZE) (CIV8) in Côte d'Ivoire; and Nimba mountains (LBR12) in Liberia. A little further to the east, Forêt Classée des Mont Guéoulé et Mont Glo Réserves (CIV8) is also considered a high relative biological priority.

In theory, the Mount Nimba area is protected: the Liberian part was designated as Monts Nimba Strict Nature Reserve in 1944, and the Guinean and Ivorian parts were declared a World Heritage Site (currently assigned the "in Danger" label) in 1981 and 1982, respectively. However, iron ore mining on Mount Nimba has been a threat to biodiversity for over 20 years.

Liberia-Côte d'Ivoire Transboundary Area

Further south along the Liberia-Côte d'Ivoire border is another important transboundary cluster of KBAs with high relative biological priority. Zwedru (LBR18) in central-eastern Liberia, bordering Côte d'Ivoire, holds a number of restricted-range species, including Liberian greenbul. This species was described from two forest patches 20 kilometers northwest of Zwedru in Liberia in 1985 (Gatter 1997) but there have been no subsequent records. Grebo KBA (LBR7), also bordering Côte d'Ivoire, is an area of forest bordered on three sides by the Cavalla River. This KBA is rich in bird species and a number of threatened mammals, including Jentink's duiker, Liberian mongoose, pygmy hippopotamus, chimpanzee and West African red colobus. Other high biological priority KBAs in this complex include Cestos - Senkwen (LBR1) and Sapo National Park (LBR14) in Liberia, and Forêt Classée de Cavally et Goin - Débé (CIV3) in Côte d'Ivoire. The latter KBA is the only site in Côte d'Ivoire known to hold the Endangered Gola malimbe.

Another high relative biological priority in Liberia is a cluster of subcatchments around Weeni Creek in Grand Bassa County (fw12), where a Critically Endangered crab, *Liberonautes grandbassa*, and three threatened fish species are found. This freshwater crab's entire known global distribution is within Weeni Creek where it is currently unprotected and subject to the impacts of ongoing deforestation.

Southern Côte d'Ivoire and Ghana

Further to the east, in southeastern parts of Côte d'Ivoire and southwestern parts of Ghana, are a significant number of important forest reserves that are also confirmed KBAs of high relative biological importance. These comprise Adiopodoume (CIV1), Forêt Classée de Bossematié (CIV2) and Forêt Classée de Yapo et Mambo (CIV6) in Côte d'Ivoire, and Atewa Range Forest Reserve (GHA3), Boin Tano Forest Reserve (GHA6), Cape Three Points Forest Reserve (GHA9), Draw River Forest Reserve (GHA11), Jema-Asemkrom Forest Reserve (GHA14), Neung South Forest Reserve (GHA19), Sapawsu Forest Reserve (GHA22), Southern Scarp Forest Reserve (GHA24), Subri River Forest Reserve (GHA25) and Tano-Offin Forest Reserve (GHA29) in Ghana. In addition to these terrestrial KBAs, the Lower Bandama River in Côte d'Ivoire is a Priority 2 freshwater KBA (fw3) holding an Endangered mollusk and a Vulnerable freshwater plant.

Ghana-Togo Transboundary Area

In the transitional zone between the Upper and Lower Guinean Forests, along the border between Ghana and Togo, Kyabobo (proposed) National Park (GHA16) and Missahoé Forest Reserve (TGO2) are of interest. Kyabobo (proposed) National Park, although not fully surveyed, has a number of threatened species such as the Endangered Ukamia reed frog (*Hyperolius torrentis*). Missahoé Forest Reserve is the only site in Togo where many forest species have been recorded (BirdLife International 2015). A single transboundary freshwater KBA in the Lower Volta eastern catchment (fw5) has a number of restricted range freshwater fish and mollusks, including the Endangered butterfish (*Irvineia voltae*) which is only known from the lower Volta river basin.

Lower Guinean Forests Subregion

The Lower Guinean Forests subregion of the hotspot has 28 terrestrial KBAs and five freshwater KBAs of high relative biological importance (i.e. Priority 1 and 2 sites). Seventeen of these sites meet the criteria for AZE sites, mainly for small mammal and amphibians (Table 4.10), although only 10 of them are currently recognized as such on the Alliance's website.

Nigeria

On the Nigeria-Cameroon border is a cluster of three KBAs of high relative biological importance: the Mbe Mountains and Cross River National Park: Okwangwo Division (NGA7), Afi River Forest Reserve (NGA1) and Obudu Plateau (NGA9). The former KBA is most famous for its important population of the Critically Endangered Cross River subspecies of western gorilla. Including the discontiguous Oban Division (NGA4), Cross River National Park supports 11 species of primates, include the Nigeria-Cameroon subspecies of chimpanzee (*Pan troglodytes ellioti*), Preuss's monkey and drill. African elephant is also recorded here and plant diversity is high. Afi River Forest Reserve KBA, which abuts the Mbe Mountains to the west, is a large forest area where western gorilla, red-eared monkey and drill are present. The threats from agricultural expansion and intensification, hunting and logging are ranked as current and "very high" by BirdLife International (2015), despite conservation presence. The Mbe Mountains Community Wildlife Sanctuary, an integral part of the Mbe Mountains and Cross River National Park: Okwangwo Division KBA, forms an important habitat corridor and contains important populations of several threatened species, including western gorilla, chimpanzee, drill, leopard and African elephant. Further along the Nigeria-Cameroon border to the northeast, Obudu Plateau KBA is a wet and mountainous extension of the Cameroon Mountains. The site holds a number of threatened and restricted-range amphibians and birds, including the Endangered white-throated mountain-babbler (*Kupeornis gilberti*). Preuss' monkey still occurs and western gorilla is thought to occasionally visit the site. Further still to the northeast, Ngel-Nyaka Forest Reserve (NGA8), close to Gashaka-Gumti National Park, is ranked as a Priority 2 KBA.

Central Nigeria has no KBAs specifically prioritized for high relative biological importance but, to the west of the country, about 135 kilometers north of Lagos, Omo Forest Reserve (NGA11) is the main stronghold for Ibadan malimbe, an Endangered bird restricted to a few patches of forest in southwestern Nigeria. Once again this KBA is considered to be at very high risk due to agricultural expansion and logging (BirdLife International 2015). The site is also known for its high diversity of bird species. IITA Forest Reserve, near Ibadan (NGA6), while small and isolated, also qualifies as a Priority 2 KBA.

Two freshwater KBAs are located in the Niger Delta, an area heavily impacted by oil spills, loss of mangrove habitat, and extensive infestation by the invasive water hyacinth (*Eichhornia crassipes*). West Niger Delta KBA (fw13), in the part of the delta southwest of Benin City, has two Endangered freshwater shrimps: *Desmocaris bislineata* and *Euryrhynchina edingtonae*. The former species has its known global range restricted to the KBA. South East Niger Delta near Calabar KBA (fw10) is located in the eastern side of the delta at the lower reaches of the Cross River. This KBA has a small number of threatened and restricted range fishes and plants and one species of freshwater crab. An Endangered species of killifish, *Fundulopanchax scheeli*, is entirely restricted to this KBA. The Vulnerable crab, *Potamonautes reidi*, which has a global range restricted to the Niger Delta, is also present at the site.

Cameroon

Twelve Priority 1 terrestrial KBAs of the highest relative biological importance are located in Cameroon, dispersed throughout the Cameroon Highlands mountain range. In almost all cases, these KBAs have been ranked highly due to the presence of highly range restricted and/or threatened species of amphibians and small mammals but a number of other species of conservation concern are also found at these sites.

Nine of these KBAs are recognized as AZE sites. In the northeasternmost extremity of the hotspot, Mont Nganha (CMR10) on the Adamawa Plateau is the only known location for the Critically Endangered frog, *Astylosternus nganhanus*. Tchabal Mbabo (CMR18) also holds the only known population of another Critically Endangered frog, *Cardioglossa alsco*, which is dependent upon the remaining gallery forest and more inaccessible slopes where forest cover remains. Bakossi Mountains (CMR1), Bamboutos Mountains (CMR3) and Mont Manengouba (CMR9) are all also important for their populations of highly range-restricted, threatened amphibians. Mount Rata and Rumpi Hill Forest Reserve (CMR16) is of high importance on account of the Critically Endangered frog, *Alexteroon jynx,* and the Endangered Rumpi mouse shrew (*Myosorex rumpii*), both of which are only known from this location. Mount Oku (CMR15) has five species of Critically Endangered, restricted range amphibians and small mammals. The KBA is considered to be under very high and immediate threat from agricultural expansion, human disturbance and fire (BirdLife International 2015). Mount Cameroon and Mokoko-Onge (CMR12), a vast volcanic dome west of Douala, holds the entire global world populations of Burton's vlei rat (*Otomys burtoni*), Mount Cameroon forest shrew (*Sylvisorex morio*) and Mount Cameroon francolin, all of which are Endangered. Large mammals of conservation concern include the Endangered drill and the Vulnerable African elephant, while levels of plant endemism are also reported to be high (BirdLife International 2015). Finally, Mount Lefo (CMR13) on the Barmileke Plateau is thought to hold the global population of the Endangered Mount Lefo Brush-furred Mouse (*Lophuromys eisentrauti*). This area is densely populated and under threat from logging operations.

Other KBAs of the highest biological importance in Cameroon include Mount Kupe Integral Ecological Reserve (CMR8), a small KBA near the Bakossi Mountains, which supports one of only a few subpopulations of an Endangered frog, *Werneria preussi*, plus several other Endangered species, including drill, five-toed skink (*Leptosiaphos pauliani*), Kupe bush-shrike (*Telophorus kupeensis*) and white-throated mountain-babbler. A short distance to the east, Mont Nlonako (CMR11) is another KBA that holds a large number of threatened amphibians, including three Endangered species of frog with highly restricted ranges. The Critically Endangered Preuss's red colobus and drill are also present. Lastly, Mbi Crater Faunal Reserve – Mbingo Forest (CMR6) is important for a large number of highly threatened and restricted-range species of small mammals, such as the Critically Endangered Cameroonian shrew, amphibians and birds. A recent evaluation of the site by BirdLife International (2013) rated the threat from agricultural expansion and livestock as very high and current.

An additional four terrestrial KBAs in Cameroon are ranked as Priority 2 sites, namely Bali-Ngemba Forest Reserve (CMR2), Mont Bana (CMR7), Mount Mbam (CMR14) and Yabassi (CMR19). These are all located along the eastern edge of the hotspot.

Cameroon contains two freshwater KBAs of high relative biological priority. The first of these, Lake Barombi Mbo and surrounding catchments (fw1), to the northeast of Doula, partly overlaps with Mount Cameroon and Mokoko-Onge KBA. Thirty-seven species of freshwater fishes, plants, dragonflies and shrimps trigger the KBA criteria in this site, including two species of fish (*Clarias maclareni* and *Sarotherodon lohbergeri*) and one plant (*Ledermanniella batangensis*) that are Critically Endangered. The latter species has not been recorded since its original collection in 1908 and may be extinct. A most important focal area within this KBA is Lake Barombi Mbo, a crater lake of approximately 7 km^2 in area, with a high diversity of endemic freshwater species. The catfish, *C. maclareni,* is endemic to the lake along with 11 species of endemic cichlid fishes. The main threat to the lake is the expansion of oil palm plantations, proposed tourism development, water abstraction for Kumba town, and deforestation leading to increased sedimentation in the lake. The Sunda Gorge Dam on the lower Nyong River poses a potential threat to many riverine species should its construction be resumed.

The freshwater KBA, Lake Bermin and surrounding catchments (fw2) is located northwest of Ngongsamba, and partly overlaps with Bakossi Mountains KBA (CMR1) and Mont Manengouba KBA (CMR9), as well as overlapping more significantly with Banyang Mbo Wildlife Sanctuary KBA (CMR4) and largely overlapping Banyang Mbo Wildlife Sanctuary KBA (CMR4). Forty-nine freshwater KBA trigger species are present within the site including many fish, dragonfly, and plant species. Nine species of Critically Endangered cichlid fishes are endemic to another tiny crater lake, Lake Bermin, within this KBA, and two Critically Endangered species of odonata are found within the wider KBA.

São Tomé and Príncipe, and Equatorial Guinea

The chain of oceanic islands of Bioko, Príncipe, São Tomé and Annobón contains six terrestrial KBAs and one freshwater KBA assigned a priority ranking of 1 or 2. One of these, Parque Natural Obô de São Tomé e Zona Tampão (STP2), overlaps with two confirmed AZE sites (São Tomé uplands and São Tomé lowlands).

Parque Nacional del Pico de Basilé (GNQ3) in the northern part of the island of Bioko holds the endemic bird species, Fernando Po speirops (*Speirops brunneus*), along with 28 other bird species which occur as endemic races on Bioko (BirdLife International 2015). Four globally threatened primates occur here: Preuss's monkey; red-eared monkey; black colobus (*Colobus satanas*); and drill. In addition, one fish and three reptile species are endemic to the island (BirdLife International 2015). Four species of marine turtle (green, hawksbill, olive ridley and leatherback) nest on Bioko's southern beaches along a restricted 20 kilometer coastline, and the island is considered the most important in the region in terms of number of sea turtle species and nesting individuals (Castroviejo *et al.* 1994).

Parque Natural Obô do Príncipe (STP1) on the island of Príncipe has four bird species of conservation concern and seven species bird species endemic to the island. The island endemics include the Critically Endangered Príncipe thrush. At least six species of reptile, four species of frog and one species of shrew are also endemic to the island. A number of marine species of conservation concern are found in the near shore coastal waters, including several threatened sharks and green turtle.

São Tomé has three terrestrial KBAs of high biological importance: Parque Natural Obô de São Tomé e Zona Tampão (STP2); Zona Ecológica dos Mangais do Rio Malanza (STP3); and Zona Ecológica da Praia das Conchas (STP4). These three KBAs are primarily noted for their numerous bird species of conservation concern. All three of them overlap with São Tomé (fw9): a freshwater KBA of high biological importance. This KBA supports an Endangered freshwater shrimp, *Atya intermedia*, which is otherwise known only from the island of Annobón in Equitorial Guinea.

As well as its importance as one of only two sites to support *A. intermedia*, Annobón KBA (GNQ1) is an important breeding site for a number of seabirds and at least two threatened species of marine turtle: hawksbill turtle; and leatherback.

4.3.4 KBA Gap Analysis

The majority of Priority 1 terrestrial KBAs have been prioritized due to the presence of site-endemic threatened species of amphibians and/or small mammals. These sites also qualify as AZE sites and are rightly considered high priority sites for actions to avoid the imminent species extinctions. However, this heavy focus on small-bodied, range-restricted species, all of which are well suited to benefit from site-based conservation, may have led to a lack of focus on some of the more widespread but also highly threatened species, which may also benefit from site-based actions. A subsequent analysis revealed that the most highly threatened (CR and EN species) and wide-ranging species (irreplaceability scores of 3 and 4) were, however, relatively well represented within the proposed network of Priority 1 and 2 KBAs (Table 4.11).

Table 4.11 Highly Threatened Species (CR/EN) with Irreplacebility Scores of 3 or 4 (i.e. Ranges that Overlap between 2 and 100 KBAs within the Hotspot)

Threatened Species	Common Name	Number of Priority 1 KBAs Overlapping the Species's Range	Number of Priority 2 KBAs Overlapping the Species's Range	Number of Priority 1 & 2 KBAs Overlapping the Species's Range
Cephalophus jentinki	Jentink's duiker	3	7	10
Cercopithecus diana	Diana monkey	5	21	26
Cercopithecus preussi	Preuss's monkey	3	2	5
Chelonia mydas	Green turtle	5	6	11
Choeropsis liberiensis	Pygmy hippopotamus	3	9	12
Necrosyrtes monachus	Hooded vulture	2	8	10
Pan troglodytes	Chimpanzee	11	29	40
Procolobus badius	Western red colobus	4	17	21
Scotopelia ussheri	Rufous fishing-owl	2	2	4
Tieghemella heckelii[1]	Cherry mahogany	3	8	11

[1] The absence of a range map for this species means its presence within these KBAs still needs to be confirmed.

Other highly threatened (CR or EN) terrestrial species that are less widespread but are not site endemics (i.e. they have an irreplaceability score of 2), including species such as western gorilla, are present within many of the 43 Priority 2 terrestrial KBA sites. Only 19 terrestrial CR or EN species are not covered by at least one of the Priority 2 KBAs. The majority of these species are amphibians and birds with distribution ranges overlapping at least some KBAs which are currently fully enclosed within existing protected areas, such that they have a lower priority ranking due to perceived higher current levels of protection.

4.3.5 Current Overlap between KBAs and Protected Areas

When assessing the level of protection provided for KBAs by the protected areas network, it was decided, following advice received through the first stakeholder consultation workshop, to limit the analysis of KBA spatial overlap with protected areas (as held within the World Database on Protected Areas (WDPA)) to those classified by IUCN as Category I, II, III or IV. This restriction to Category I to IV protected areas is based on the reported large number of protected areas in the hotspot that either no longer exist (such as forest reserves where all forest has since been cleared) or that are not expected to currently provide any effective protection.

A total of 25,925 km^2 (approximately 24 percent) of land area within KBAs is within the boundaries of existing Category I-IV protected areas. The level of cover by protected areas for individual KBAs is presented in Appendix 5. Twenty KBAs have at least 90 percent of their area within the boundaries of Category I-IV protected areas and, in most cases, share the same boundaries. An additional eight KBAs have between 10 and 90 percent of their area within Category I-IV protected areas. Therefore, 109 of the 137 KBAs are provided little or no protection by the current protected area network. This lack of potential protection for KBAs through inclusion within the protected areas network is an issue to be addressed for all countries of the hotspot.

4.3.6 Data Gaps, Research Priorities and Proposed KBAs

The KBA analysis and consultations with partners have shown that much remains to be understood regarding biodiversity in the Guinean Forests Hotspot. Locality data are entirely unavailable for some species, and many others lack locality data over part of their range. Plant species represent a particularly significant gap and therefore represent a high priority for further field research. IUCN Red List assessments are also lacking for many species, with plants, butterflies and reptiles (particularly in parts of the Lower Guinean Forests subregion) notably incomplete.

As a possible way forward for filling the major gap in assessment of plants for the IUCN Red List, it has been recommended that, given the large number of species present, future assessment of plant species should prioritize those classed as "useful species", country endemics and wild crop relatives (Schatz 2009). Once a species has been assessed and its status is known, restoration measures might be appropriate for ensuring the survival of some threatened species (Keenleyside *et al.* 2013). For those which cannot be conserved *in situ*, *ex situ* conservation techniques, or cultivation of species outside their native habitats are recommended (Müller and Eriksson 2013). For other species threatened by trade, such as the Vulnerable *Prunus africana*, better enforcement of existing regulations may be required.

While the KBAs presented in the ecosystem profile represent the current confirmed KBAs within the hotspot boundaries it is important to emphasize that the process of identifying KBAs is iterative, and further refinement of the KBA analysis should be considered as a part of the CEPF investment in the hotspot, in particular for plants and for freshwater subcatchments. Additionally, given the serious outbreak of Ebola in a number of countries in the hotspot, it proved difficult to obtain the necessary stakeholder input to identify more than a handful of additional KBAs for terrestrial vertebrates. One would expect, therefore, the number of KBAs and their trigger species to increase as additional data and stakeholder input are obtained. A notable geographic gap is Sierra Leone, where stakeholder consultation for the profile was highly constrained by the Ebola outbreak.

Only a small number of freshwater KBAs have been identified to date, because the stakeholder workshops necessary to identify and confirm freshwater KBAs have still largely to be conducted. Consequently, there are many gaps in the current freshwater KBA network and many threatened and restricted-range species remain outside of these sites.

Finally, although outside of the hotspot boundary, KBAs for nearshore marine fishes, which provide significant socio-economic benefits to people living within the hotspot, are still to be identified.

4.4 Corridor Outcomes

There exist multiple different definitions of a "conservation corridor" (see: http://conservationcorridor.org/library/), and thinking on corridors has somewhat shifted away from simply assessing priorities and applying a relatively rigid definition of a corridor as merely a mechanism to ensure connectivity for species (CSIRO 2008). A more fluid and flexible approach is developing, as the corridor concept matures. There is a greater recognition of the potential to manage landscapes proactively for maintenance of ecological functions, adaptation to global change, and towards sustainable economies. In addition, a more sophisticated set of conservation tools and analytical approaches are increasingly being employed to recognize and tackle the multitude of emerging priorities and opportunities, threats, trade-offs and synergies that occur across broad landscapes (e.g. systematic conservation planning tools, such as MARXAN). These tools were not used for this exercise, in order to more easily incorporate the results of previous conservation planning exercises in the region, which had established spatial priorities at site and landscape scale with broad acceptance among key stakeholder groups.

For the purposes of the ecosystem profile, the following set of selection criteria was employed:

1) *Hydrological units.* The use of hydrological catchments as units for corridor and KBA design was investigated and recommended through the collaborative CSIRO/CI workshop on corridors (CSIRO 2008) and was subsequently adopted as one of the corridor selection criteria for the profile. Hydrological systems are hierarchically nested based on natural topographic attributes, and this allows for logical and biological scaling. Catchments were also used in the profiling process as planning units for the definition of freshwater KBAs. This allows adoption of a basin-wide approach to conservation, which fulfils the need for connecting terrestrial, freshwater and marine biomes that are intricately linked and often impacted by threats that permeate across all three biomes. For example, land-based pollution, such as sedimentation following deforestation, has downstream effects in a catchment impacting rivers lakes and wetland ecosystems and ultimately the near shore marine environment. A final added benefit of the catchment approach is that it allows for the inclusion of transboundary corridors, which are important for terrestrial and freshwater ecosystems, particularly as species (and their associated threats) do not stop at national borders, while environmental policy often does. Overall, this approach aims to help overcome disciplinary/political boundaries and facilitate integrated management of terrestrial, freshwater and marine environments.

2) *Existing corridors*. Pre-existing widely recognized landscape-scale corridors were incorporated into the corridor analysis.

3) *Clusters of connected KBAs*. This was adopted as a selection criterion because site-based actions throughout the corridor at KBAs should lead to benefits greater than the sum of all individual actions, in large part due to the connectivity of species movements and

spread of threats between KBAs. For example, reforestation of upland KBAs may provide downstream benefits to other KBAs in the corridor through a reduction in sedimentation loading. Actions at KBAs throughout a corridor may also help ensure species migration routes are maintained.

4) *Clusters of spatially proximate KBAs*. Where KBAs are located in the same area, even if not apparently connected in any hydrological or ecological sense, they may be grouped into corridors for ease of management as an investment package.

Following the above criteria, and in consultation with stakeholders through the consultation workshops, nine corridors, covering a total area of 413,183 km^2 (part of which includes the marine environment) were identified (Table 4.12; Figure 4.14). Four of these corridors are restricted to single countries, three are bi-national and two are tri-national. One hundred and five of the 137 KBAs in the hotspot are included within these corridors. All of them contain at least one Priority 1 or 2 KBA, with one corridor (Korupmba-Obachap) containing 22.

Figure 4.14 Conservation Corridors in the Guinean Forests Hotspot

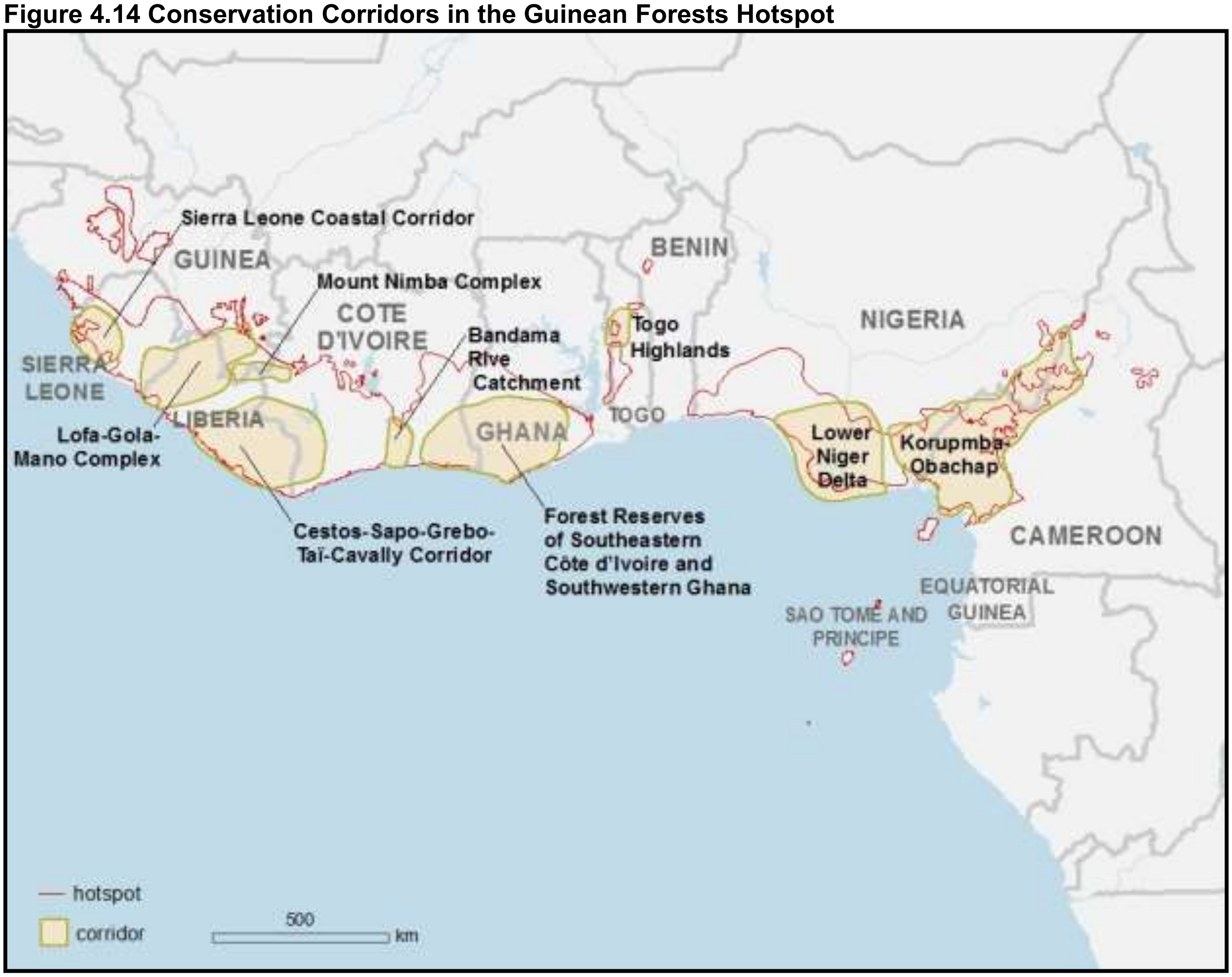


Table 4.12 Corridors Delineated within the Hotspot and Selection Criteria Met

No.	Corridor Name	Area (km^2)	Countries	Selection criteria met
1	Sierra Leone Coastal Corridor	17,096	Sierra Leone	4
2	Lofa-Gola-Mano Complex	47,545	Sierra Leone, Liberia, Guinea	1, 2, 3, 4
3	Mount Nimba Complex	6,829	Guinea, Côte d'Ivoire, Liberia	2,4
4	Cestos-Sapo-Grebo-Taï-Cavally Corridor	70,278	Liberia, Côte d'Ivoire	2,3,4
5	Bandama River Catchment	8,389	Côte d'Ivoire	1,3
6	Forest Reserves of Southeastern Côte d'Ivoire and Southwestern Ghana	72,579	Côte d'Ivoire, Ghana	4
7	Togo Highlands	6,049	Togo	4
8	Lower Niger Delta	65,743	Nigeria	3,4
9	Korupmba-Obachap	118,675	Cameroon, Nigeria	1,3,4
	Total	**413,183**		

4.5 Ecosystem Services

As summarized in Chapter 3, the ecosystems of the Guinean Forests Hotspot provide many vital services for human populations. The Co$ting Nature ecosystem service valuation tool was employed to identify those corridors with particular value in providing a subset of these services Co$ting Nature is a web-based tool for natural capital accounting and analysing ecosystem services, identifying the beneficiaries of these services and assessing the impacts of human interventions (see http://www.policysupport.org/costingnature).

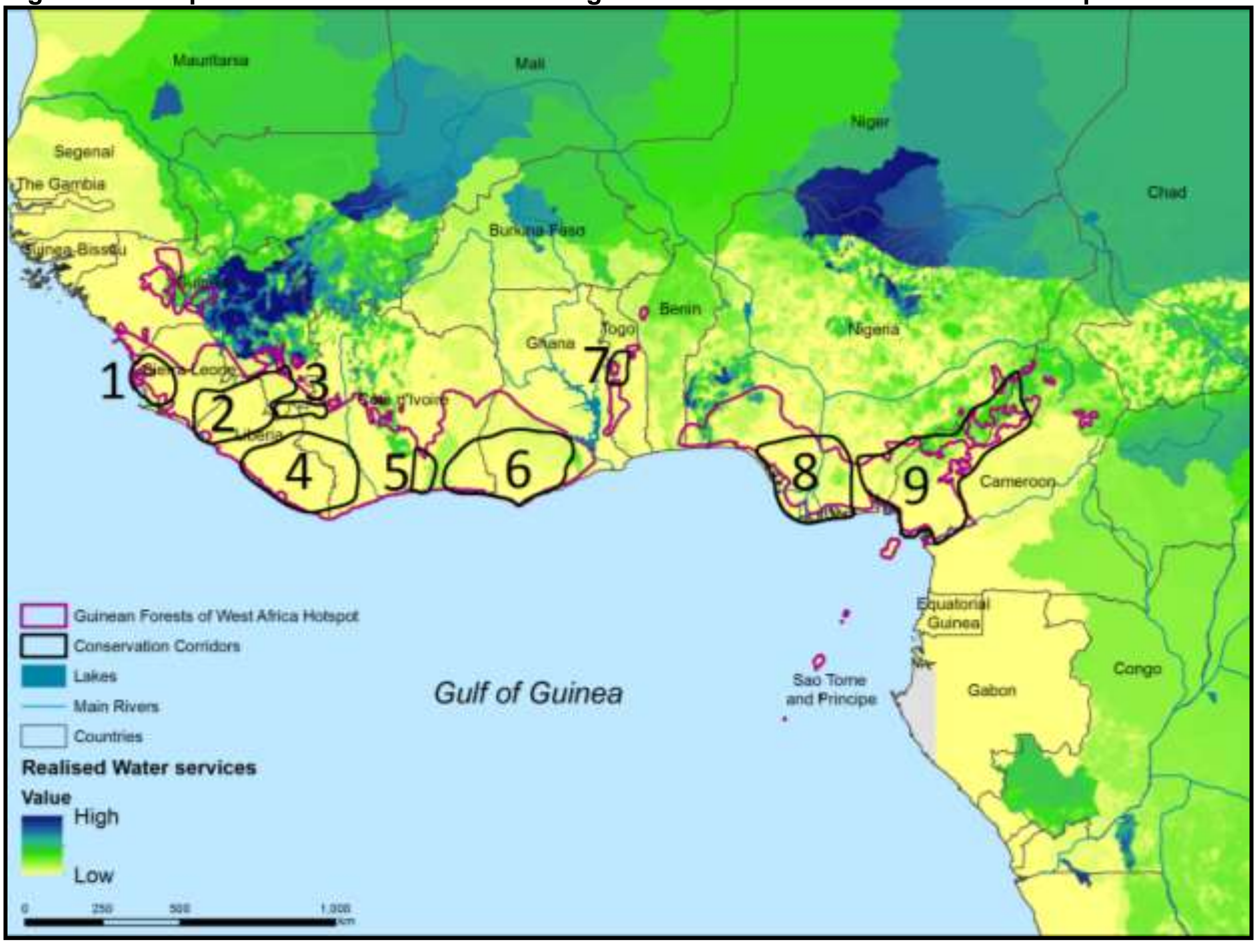
4.5.1 Provisioning Services

Water Services

Water-provisioning analysis shows the relative realized water provisioning services for the region, calculated using the Co$ting Nature water provisioning services module (Figure 4.15). The map is based on the relative volume of clean water (not impacted by humans) that is available to be used by people downstream of the water source. Areas shown as 'high' on the map represent areas where the water services are being enjoyed (realized) by local people, and where most benefit can be gained from its use for domestic purposes, agriculture, energy production, etc. As this map represents the realized services derived from water based on downstream use, the region's geography and flow direction should be considered when interpreting it.

Based on this analysis the most important region within the hotspot for water provisioning is the Fouta Djallon Massif in the highlands of Guinea, a small part of which is included within the northwest of the hotspot. Headwaters for north-flowing rivers, including the Senegal and Niger, as well as shorter, more torrential, south-flowing rivers, emanate from the Fouta Djallon. Overall, this part of the hotspot is ecologically important as a major source of water for a wide part of western Africa. Protection and management of this area is of international concern, although the vast majority of the area lies outside of the hotspot. The freshwater biodiversity of the area is noted for its high levels of endemism, such that there are likely to be sites that would qualify as KBAs in the future.

Figure 4.15 Map of Realized Water Provisioning Services in the Guinean Forests Hotspot



Source: Co$ting Nature tool

In Côte d'Ivoire the Bandama Rouge Mountain range at the head of the Bandama River is noted for high levels of water provisioning. The Lower Bandama River (fw3) is directly downstream, and the species in this KBA are currently threatened by upstream water abstraction and dams. Management of environmental flows in this river system would be highly beneficial, not only for people but also for the biodiversity in the downstream river reaches. Another area noted for high realized water services is Oyo State of western Nigeria, where the headwaters of a number of major rivers are located, including the Ogun, Oba, Oyan Otin, Ofiki, Sasa, Oni, Ernine and Osun. Like the Fouta Djallon, this area is, however, largely located beyond the boundaries of the hotspot. Finally, the Cameroon Mountains in Korupmba-Obachap (Corridor 9) are also noted as having the highest area of realized water provisioning services within the conservation corridors. Overall, however, the hotspot does not overlap greatly with areas of highest realized water provisioning services, which are found further north, in arid and semi-arid areas, where water has a higher value.

Timber and Non-timber Forest Products

The provision of goods and materials from the hotspot's forests, including medicine, housing materials and food, is quite high, contributing 25 to 35 percent of non-cash income to rural households. For instance, the *Dozobele* community, a group of medical practitioners found in some of the hotspot countries, (e.g. Côte d'Ivoire, Guinea and Sierra Leone; Leach 2004) provide the majority of the medical care to local populations in the Upper Guinean Forests subregion. Bushmeat is probably the most valuable non-timber forest product (NTFP) in the hotspot. Hunting is also shown to provide an important source of income for rural forest dwellers (Wilkie and Carpenter 1999), who respond to the increasing demand for wild meat from growing urban populations (Nasi *et al.* 2011; East *et al.* 2005).

Figure 4.16 Map of Forest Cover in the Guinean Forests Hotspot

Source: Hansen *et al.* (2013).

The supply of timber and NTFPs is likely to be directly correlated to the location of forested areas within the hotspot. The Lofa-Gola-Mano Complex (Corridor 2), Cestos-Sapo-Grebo-Taï-Cavally Corridor (Corridor 4), Forest Reserves of Southeastern Côte d'Ivoire and Southwestern Ghana (Corridor 6), Lower Niger Delta (Corridor 8) and Korupmba-Obachap (Corridor 9) all have over 30,000 km² of closed, open or fragmented forest (USGS 2002). Conversely, the remaining corridors all have less than 10,000 kilometers² of forest cover, mainly because of differences in size among them (Figure 4.16).

Fisheries

Although it is difficult to ascertain the size of the artisanal fishery in the region, it is estimated that in the region of western Africa spanning Mauritania, Chad and Gabon, 2 million individuals rely on small-scale fisheries as their primary source of income, and another 6 million depend on fishing resources as part of a diversified livelihood (WASSDA 2008). In Ghana alone, there are an estimated 10,000 artisanal vessels and 170 industrial vessels, which employ more than 200,000 individuals directly, and provide more than 1.5 million jobs in related fishery sectors (FAO 1999).

Data on the relative contribution of mangrove-related species to total fisheries catch is lacking for western Africa, but is significant in regions where it is studied, with 67 percent of the entire commercial catch in eastern Australia, 49 percent of the demersal fish resources in southern Malacca Strait, 30 percent of the fish catch and almost 100 percent of shrimp catch in ASEAN countries (Walters *et al.* 2008).

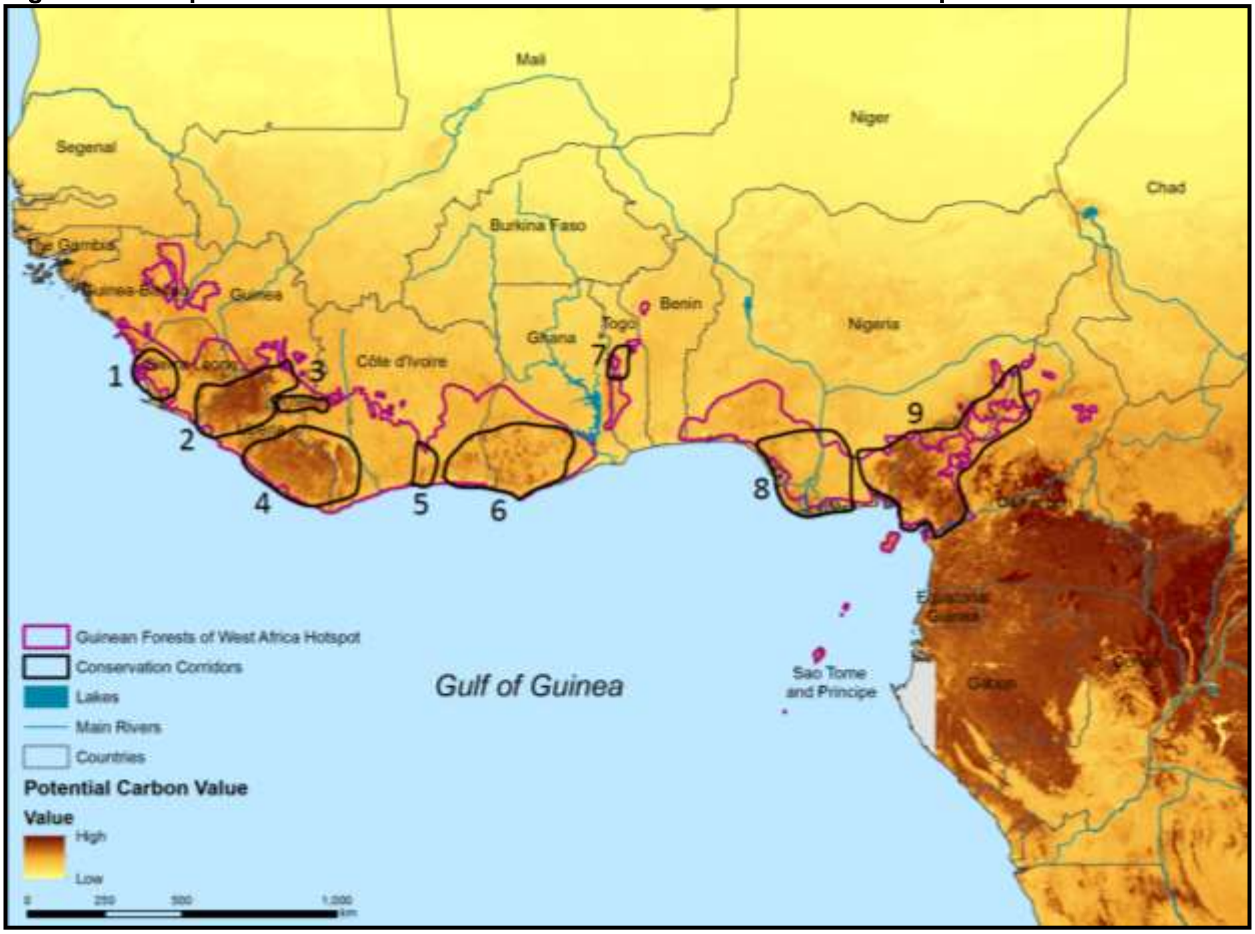
It is difficult to quantify the economic value of, or reliance upon, wetland goods and services by local communities, but it is worth noting that the value of fisheries production for the major river systems in western Africa is estimated as just over USD 200 million per year (The World Fish Center 2008). Protein from fish also makes up a large proportion of the total protein from fish and livestock sources in hotspot countries (see Section 5.3.2). All of the corridors, with the exception of Mount Nimba Complex (Corridor 3), Forest Reserves of Southeastern Côte d'Ivoire and Southwestern Ghana (Corridor 6) and Togo Highlands (Corridor 7), contain a Priority 1 or 2 freshwater KBA.

4.5.2 Regulating Services

Carbon Storage and Climate Mitigation

The potential carbon services for the region were calculated using the Co$ting Nature carbon services module, which takes into account relative carbon sequestration and carbon stock services, from living plant biomass and soil. The potential carbon value represents an ecosystem service with global beneficiaries. The Lofa-Gola-Mano Complex (Corridor 2), Mount Nimba Complex (Corridor 3), Cestos-Sapo-Grebo-Taï-Cavally Corridor (Corridor 4) and Korupmba-Obachap (Corridor 9) are notable for their high potential carbon values (Figure 4.17). This is largely a reflection of the extent and condition of remaining forest in these corridors.

Figure 4.17 Map of Potential Carbon Services in the Guinean Forests Hotspot



Source: Co$ting Nature tool.

Water Regulation, Sediment Retention and Microclimate Regulation by Forests

Forests help protect river catchments and provide hydrological services, such as supplying water for domestic and industrial consumption, irrigation, and power generation (Millennium Ecosystem Assessment 2005). Enrichment of soil by leaf litter is another service provided by forests, as well as a role in the regulation of local climate due to interaction with the water cycle (Millennium Ecosystem Assessment 2005). However, the ability of forests to regulate these services is affected by a variety of factors, such as intensity of rainfall, soil conditions, etc. Data on these factors is not readily available for the hotspot, and studies in other areas have encountered a similar lack of data with widely varying estimates of value as a result (Ninan and Inoue 2013). In addition, services may not scale linearly with forest cover (Thorsen 2014). However, as forest has to be present to provide these services, forest cover could be taken as an indication of the likelihood of providing these ecosystem services. Using this proxy, the Lofa-Gola-Mano Complex (Corridor 2), Mount Nimba Complex (Corridor 3), Cestos-Sapo-Grebo-Taï-Cavally Corridor (Corridor 4), Forest Reserves of Southeastern Côte d'Ivoire and Southwestern Ghana (Corridor 6) and Korupmba-Obachap (Corridor 9) are likely to be the most important for the provision of these regulatory services (see Figure 4.16).

Flood Regulation by Coastal Systems

The presence of coastal ecosystems, such as mangroves, can reduce the damage caused by hurricanes or large waves (Millennium Ecosystem Assessment 2005). The provision of this service will, therefore, overlap to a large extent with the provision of nursery habitats for fish.

4.5.3 Supporting Services

Forest Biodiversity

Korupmba-Obachap (Corridor 9) contains three Globally Outstanding ecoregions with high species richness and endemism (Cameroonian Highlands Forest, Cross-Sanaga-Bioko Coastal Forests, and Mount Cameroon and Bioko Montane Forests). The Sierra Leone Coastal Corridor (Corridor 1), Lofa-Gola-Mano Complex (Corridor 2), Mount Nimba Complex (Corridor 3) and Cestos-Sapo-Grebo-Taï-Cavally Corridor (Corridor 4) also include areas of the Globally Outstanding Western Guinean Lowland Forest. For further information on the values of these ecoregions, see Section 3.5.2.

Nursery Habitat for Commercial Fish Species

Mangrove areas are critical nursery and spawning grounds for many fish and shrimp species (Mumby *et al.* 2004; Ellison 2008), with offshore commercial fishing in the hotspot relying on mangroves functioning as nursery grounds (UNEP 2007). The Lower Niger Delta (Corridor 8) contains the Globally Outstanding Niger Delta ecoregion, with the highest concentration of monotypic fish species in the world, as well as the Locally Important Central African Mangroves ecoregion. The mangroves and freshwater swamp forests of this corridor provide habitats for aquatic mammals, mollusks, herpetofauna, and are important for numerous waterbirds. The Sierra Leone Coastal Corridor (Corridor 1) contains the Continentally Outstanding Northern Upper Guinea ecoregion, whose mangrove forests are breeding and nesting grounds for many species of fish, insects and shellfish. For further information on the values of these ecoregions see Section 3.5.2.

4.5.4 Cultural Services

Traditional Sacred Groves

Sacred groves are found in all villages and can provide valuable, albeit spatially limited, protection to forest fragments in farmed landscapes. In Ghana alone, it has been estimated that between 2,000 and 3,200 sacred groves exist (Gordon 1992). The locations of these traditional sacred groves have not been comprehensively mapped, so it is not possible to ascertain which corridors or KBAs are especially important for providing this cultural service. However, the Osun-Osogbo Sacred Grove in the Nigerian section of the hotspot has been given World Heritage Site status, which provides cultural services by being an active religious site where daily, weekly and monthly worship takes place, as well an annual processional festival. See Section 5.1.2 for further information on sacred groves.

Tourism Services

As mentioned in Chapter 3, tourism is of some importance to the economies of western African countries, especially Nigeria. A spatial map of tourist visits (Figure 4.18) suggests that most tourism is mainly not associated with forests but, instead, confined to coasts, mountains and some interior savanna protected areas. The map is based on relative density of Panoramio photos in non-urban areas. Panoramio is a community-powered site for exploring places around the world through photography: cities, natural wonders, etc. These photos are made available through Google Earth. Generally, areas on the map showing up as ‘high’ on the index (blue dots) mean there is a sight of interest to tourists in the region. However, as this a realized index, some countries may show low nature-based tourism if they contain areas of interest to tourism that cannot be accessed due to political unrest, difficult access or some other reason, as is the case for Liberia. Potential tourism services will therefore not always be represented here if access is restricted at present.

Hotspot countries have seen an increasing trend in tourist numbers since 2000, although numbers are still much lower than other countries in the area. Nigeria has the highest visitor numbers compared to other countries within the hotspot, with just under 4.5 million visitors in 2012 (World Bank 2015a). Unfortunately, events in West Africa over the past couple of years have further reduced tourism flows to the Upper Guinea portion of the hotspot, especially during the recent Ebola crisis. See Section 5.1.1 for further discussion. Nevertheless, a few of the forest protected areas in the hotspot do attract appreciable numbers of tourists, as below:

Kakum National Park. Located in the central region of Ghana, this national park covers 360 km^2 of rainforest. Seven primate species are found in the park, including Diana monkey, together with more than 500 species of butterflies and about 250 species of birds. The park became Ghana’s first protected area in 1994 and has received major international support for visitor facilities, including a canopy walkway. Tourism numbers have increased over the years: 2,000 in 1992; 27,000 in 1996; over 70,000 in 1999; and 135,870 in 2009. More recent figures could not be located but the site is known to remain very popular, particularly with domestic visitors, including school children.

Gola Forest Reserve. Despite being promoted as a visitor attraction, the number of tourists to Gola is extremely low, with possibly no visitors throughout 2014, due to the Ebola outbreak in Sierra Leone. The Western Area Peninsula National Park outside the capital Freetown received more visitors, with people staying on beach hotels taking short trips to see the forest.

Taï National Park. Cote d’Ivoire was once a popular destination for foreign tourists, especially from France. Some of these tourists visited Taï National Park to see wild chimpanzees. Numbers of tourists have fallen since the civil wars but figures for the actual number of tourists visiting Taï in recent years are not available. Since 2009, the Wild Chimpanzee Foundation has been helping communities around the park to develop a community-based ecotourism project that offers a range of touristic activities based on the concept of Nature and Culture to highlight the exceptional heritage of Taï and its surroundings (WCF 2015).

Figure 4.18 Map of Realized Nature-based Tourism Services in the Guinean Forests Hotspot

Source: Co$ting Nature tool.

5. SOCIOECONOMIC CONTEXT OF THE HOTSPOT

The 11 countries of the Guinean Forests Hotspot are highly complex from both social and economic standpoints. The complex mix of cultures and indigenous groups found across the region has been further complicated by historic and ongoing migrations of people, including into, from and within the hotspot and its countries. Historical and contemporary periods of civil unrest and disease outbreaks have contributed to the remaining high levels of poverty in the region and acted as obstacles to development. Amidst all this, many of the region's industries, such as agriculture, mineral and oil extraction and forestry, among others, have continued to shape the landscapes.

All of these factors have implications for biodiversity conservation, and can significantly influence the success of conservation efforts in the region. This chapter provides the socioeconomic context of the region, and links this to biodiversity conservation. It presents information on the culture, social status and demography of the hotspot's human populations, as well as on major economic trends and sectors. As appropriate, this information is placed within the context of nature conservation, in order to paint a picture of how these complex topics are inter-related. The chapter is based upon a review of current knowledge, as documented in the published literature, and is complemented by information gathered through consultations with selected stakeholders across the region.

5.1 Introduction and Historical Context

5.1.1 Historical Context

Recent archaeological investigations reveal that forests in Cameroon were occupied by people from the Middle Stone Age (as early as 280,000 years ago, Lavachery *et al.* 2012). There is evidence of sedentary farming and cattle domestication in West Africa from the 5th millennium BC and archaeological records show evidence of iron smelting and forging in Cameroon as early as 3,000 to 2,500 BC (Zangato and Holl 2010).

Successive waves of immigration and colonization have occurred through pre-historical and historical times. The Bantu expansion into Central Africa probably originated in what is now Cameroon and Eastern Nigeria but the direction of expansion was to the south and east. Hence, West Africa is largely populated by non-Bantu speaking peoples (see Section 5.1.2). Within the hotspot countries, only some southern Cameroon tribes and the Fang people of Equatorial Guinea (80 percent of the population) are of Bantu origin.

Significant West and Central African empires in historical times included the Sao and Kanem-Borno Empires in the Chad Basin and the Kano and other Hausa Kingdoms, which were absorbed into the Islamic Sokoto Caliphate in 1805. In West Africa, the Nok culture from 1,000 BC was followed by the Ghana, Mali and Songhai Empires in the 1st and 3rd centuries AD. These vast, wealthy empires were based on gold, salt mining and camel trade with North Africa, across the Sahara Desert, and were also associated with the southward and westward spread of Islam. Further south, the 10th century Kingdom of Nri fostered the development of the Igbo peoples and the Akan Empire of Ashanti. Camel trade across the Sahara brought influences from Mediterranean, Arab and Nile Valley cultures, and sea routes brought wider European influences from the 15th century onwards.

European coastal settlements and trade (including the slave trade) generated huge impacts from the 15th century onwards, as did European colonialism in the 19th and 20th centuries. By the beginning of the 20th century, among the hotspot countries, only Liberia was independent (having gained independence from the United States in 1862). Britain was the colonial power in Sierra Leone, Gold Coast (part of present-day Ghana) and Nigeria. France controlled Guinea, Côte d'Ivoire and Benin as part of 'French West Africa'. Until the Treaty of Versailles in 1919, Germany was the colonial power in Togoland (encompassing part of present-day Ghana and the nation of Togo) and most of Cameroon (subsequently divided between British and French rule). São Tomé and Príncipe was under Portuguese rule, having been discovered uninhabited in the 15th century. Portugal also colonized Bioko (Fernando Po), which was later ceded to the Spanish as part of 'Spanish Guinea', now Equatorial Guinea. All of these countries gradually gained independence from 1957 onwards.

The interaction between immigrants and Indigenous Peoples has had huge impacts on cultures across the hotspot. Also, colonial history has a large effect on present-day systems of governance and policy relevant to conservation. For example, policies related to forest and protected area management in Francophone and Anglophone countries are very different (see Chapter 6).

Since independence, land tenure in the hotspot countries has typically been based on a blend of customary and statutory rights, although there have often been inconsistencies between the two systems. This can result in conflict, for example between those holding land under customary law and governments wishing to enforce their access to national (i.e. unregistered) land (USAID 2015). Some governments (e.g. Cameroon and Côte d'Ivoire) have in recent years been seeking to address this issue by introducing reformed land laws, aimed at easing formalization of customary land tenure through use of supportive registration processes. However, perceptions are that these reforms have had limited success (USAID 2015). One example is of the Bagyéli pygmy people in Cameroon, who have a customary system of land tenure involving communal access to forest resources as members of residential units. During a compensation program by the Cameroon Oil Transport Company, however, these customary rights were not taken into account, and in 2012 the United Nations Economic Commission for Africa (UNECA) stated that the Bagyéli had received no individual compensation for the pipeline project (UNECA 2012). Chapter 8 examines in further detail the implications of land tenure arrangements for conservation outcomes in the hotspot.

In March 2014, cases of Ebola Virus Disease were reported in Guinea, marking the recognized beginning of the worst recorded outbreak of this disease. The most severely affected countries were Guinea, Liberia and Sierra Leone, with a total of 26,969 confirmed cases and 11,135 confirmed deaths as of May 2015 (WHO 2015). While Liberia recently reached zero cases, new cases are still occurring in Guinea and Sierra Leone. The outbreak will only be considered to have ended 42 days after the last confirmed case has tested negative twice for the virus (WHO 2015). International organizations such as the World Health Organization (WHO), the World Bank and international governments are coordinating public health and fiscal responses to the outbreak.

Ebola has had a significant impact on the economies of the affected countries, with a predicted forgone USD 1.6 billion in economic growth in 2015 (Thomas *et al.* 2015). The economic impacts are due to a reduction in tourism to the region and contraction of production in key industries, especially in Liberia and Sierra Leone. Although there are no tourism figures for Guinea since 2008, it is likely that the same effect has occurred there. There is also predicted to be a smaller economic impact beyond the three most affected countries.

As well as the economic impact, Ebola is likely to have affected conservation efforts in the hotspot, although it is too soon to accurately quantify the impact, due to a lack of scientific research on the subject. Potential impacts include hampering conservation efforts by impeding the movement of people around the hotspot, reduction in available funds due to reduction in tourism numbers (potentially for a considerable time after the current outbreak is declared over), and increased pressure on natural resources due to shortage of food and other supplies (see discussion in Altizer and Rushmore 2014). As the Ebola virus can also be transmitted to apes, there is also a potential threat to western gorilla and chimpanzee populations, should this happen.

5.1.2 Religions, Languages and Ethnicity

Islam is the predominant religion of the interior and western coast of West Africa. Within the hotspot, traditional Muslim areas include Guinea (more than 90 percent of the population), inland areas of Sierra Leone and Liberia, and the northern halves of Cameroon, Nigeria, Benin, Togo, Ghana and Côte d'Ivoire (Table 5.1).

Table 5.1 Languages, Ethnic Groups and Religions of the Hotspot Countries

Country	Number of Extant Languages	Major Ethnic Groups	Religions and Belief Systems
Benin	55	Fon and related 39.2%, Adja and related 15.2%, Yoruba and related 12.3%, Bariba and related 9.2%, Peulh and related 7%, Ottamari and related 6.1%, Yoa-Lokpa and related 4%, Dendi and related 2.5%, other 1.6%, unspecified 2.9%	Christian 43%, Muslim 24%, indigenous beliefs 17%, other 16%
Cameroon	280	Cameroon Highlanders 31%, Equatorial Bantu 19%, Kirdi 11%, Fulani 10%, Northwestern Bantu 8%, Eastern Nigritic 7%, other African 13%, non-African < 1%	Indigenous beliefs 40%, Christian 40%, Muslim 20%
Côte d'Ivoire	81	Akan 42.1%, Voltaiques or Gur 17.6%, Northern Mandes 16.5%, Krous 11%, Southern Mandes 10%, other 2.8%	Muslim 38%, Christian 33%, indigenous beliefs 12%, none 17%
Equatorial Guinea	14	Fang 85.7%, Bubi 6.5%, Mdowe 3.6%, Annobon 1.6%, Bujeba 1.1%, other 1.4%	Christian 93%, indigenous beliefs 5%, Muslim 2%
Ghana	81	Akan 47.5%, Mole-Dagbon 16.6%, Ewe 13.9%, Ga-Dangme 7.4%, Gurma 5.7%, Guan 3.7%, Grusi 2.5%, Mande-Busanga 1.1%, other 1.6%	Christian 69%, Muslim 16%, indigenous beliefs 8%, other 1%, none 6%
Guinea	37	Peuhl 40%, Malinke 30%, Soussou 20%, smaller ethnic groups 10%	Muslim 85%, Christian 8%, indigenous beliefs 7%
Liberia	31	Kpelle 20.3%, Bassa 13.4%, Grebo 10%, Gio 8%, Mano 7.9%, Kru 6%, Lorma 5.1%, Kissi 4.8%, Gola 4.4%, other 20.1%	Christian 86%, Muslim 12%, indigenous beliefs 1%, none 1%
Nigeria	520	More than 250 ethnic groups, the most populous being: Hausa and Fulani 29%, Yoruba 21%, Igbo (Ibo) 18%, Ijaw 10%, Kanuri 4%, Ibibio 3.5%, Tiv 2.5%	Muslim 50%, Christian 40%, indigenous beliefs 10%
São Tomé and Príncipe	4	Several ethnic groups, reflecting the complex history of colonialization and settlement	Christian 78%, none 19%, other 3%
Sierra Leone	25	Temne 35%, Mende 31%, Limba 8%, Kono 5%, Kriole 2%, Mandingo 2%, Loko 2%, other 15% (includes Liberian refugees)	Muslim 60%, indigenous beliefs 30%, Christian 10%
Togo	43	37 tribes, of which the largest and most important are Ewe, Mina, and Kabre (99%); other 1%	Indigenous beliefs 51%, Christian 29%, Muslim 20%

Sources: ReligionFacts (2014); Paul *et al.* (2015).

Christianity was introduced by European missionaries during colonial times and has become the predominant religion in the central and southern parts of Nigeria, and the coastal regions stretching from southern Ghana to coastal parts of Sierra Leone. Catholicism is the predominant religion in Equatorial Guinea (87 percent) and São Tomé and Príncipe (72 percent), followed by other forms of Christianity and traditional beliefs. 'Traditional African religions' are also intimately linked with the historical and cultural heritage of different populations.

Although the majority of the periods of war and unrest seen in the hotspot's countries (described later in this chapter) are not typically on sectarian grounds, there are indeed some cases where this may be a factor. One example is the Boko Haram jihadist group in Nigeria (2009 - present), whose activities have led to the displacement of millions of people. The implications of such disputes for conservation in the region are discussed in Section 5.2.4.

Sectarian conflicts aside, the direct influences of religion on biodiversity conservation in the hotspot are unclear. One exception is the influence of some traditional beliefs and practices, which can have both positive and negative implications. In Benin, Ghana and Togo, for instance, traditional sacred groves (sometimes called 'fetish groves') are designated as areas where resource harvest and even entrance by people is highly restricted. This practice is believed to have local benefits for the conservation of biodiversity held within the groves (Decher 1997; Campbell 2005; Dudley *et al.* 2009), although no rigorous and comprehensive studies have been conducted to examine the extent of these benefits. Conversely, many of the region's traditional belief systems involve the practice of harvesting wild species for use in traditional medicines. Such practices occur throughout the region, and frequently involve the capture and trade of rare or threatened species, including mammals (Djagoun *et al.* 2012), birds (Nikolaus 2001, 2011) and reptiles (Segniagbeto *et al.* 2013). No comprehensive studies have examined the impacts of these practices on wildlife populations, although all work describing the practice at a local scale assumes them to be significant, particularly where threatened species are involved.

Languages across the region are also very diverse (Nigeria alone has 529 officially recognized languages). Cameroon and Nigeria are part of a core area renowned for global biocultural diversity including of language (Loh and Harmon 2005). In several countries, a form of Creole is used (e.g. Krio is spoken by 90 percent of the population of Sierra Leone). There are semi-Bantu speaking peoples in some parts, including around 5,000 pygmy people in the southern coastal forests of Cameroon.

Official languages in most countries are those of the former colonial power. Most countries in West and Central Africa are either Anglophone or Francophone; in some cases, both (e.g. Cameroon). National languages in Equatorial Guinea and São Tomé and Príncipe reflect their very mixed histories of colonization and immigration. Equatorial Guinea has three (French, Portuguese and Spanish) and São Tomé and Príncipe has several languages spoken, including the official language (Portuguese; spoken by 95 percent of the population), Portuguese-based creoles such as Forro (85 percent) and Cape Verdean Creole (9 percent).

The diverse range of ethnic groups present in the hotspot means that there is potential for marginalization of groups who are in the minority. Of the hotspot countries, Cameroon, Côte d'Ivoire, Equatorial Guinea, Guinea, Nigeria and Togo are all listed as having ethnic communities at risk of repression (Minority Rights Group International 2014). Of these, Nigeria is listed as the 12th highest ranked country globally in terms of threats to ethnic groups, due to activities of Boko Haram in the north of the country and deep-rooted conflicts between settled farmers and nomadic herders. Political and economic marginalization also occurs in hotspot countries due to land-rights issues (see Section 5.1.1). However, there is no evidence to suggest that ethnic diversity, by itself, is an impediment to conservation.

5.2 Demographic and Social Trends

5.2.1 Regional and National Demographics; Ecological Footprint of Countries

The hotspot countries have a combined population of 282.4 million (Table 5.2). Because it is bounded by biogeographic and not political boundaries, demographic data specific to the hotspot are not available, although the total population was estimated at 84.7 million in 2004 (Mittermeier *et al.* 2004), indicating an average population density of 136 people per km^2. However, centers of population are distributed patchily across the hotspot. While many areas of the hotspot have between 10 and 100 people per km^2, population densities can reach much higher numbers in major cities.

There are nine population centers with 500,000 or more people in the hotspot countries (see Section 5.2.2). In Cameroon, two of the country's major population centers are located within the hotspot, representing the cities of Douala and Bafoussam, and these are much more expansive than other population centers within the country. In the Upper Guinean Forests subregion, population centers are typically smaller and less clustered than in the Lower Guinean Forests subregion. In Sierra Leone's component of the hotspot, notable population centers are found in and around the cities of Freetown, Kenema, Koidu and Makeni. In Côte d'Ivoire's component, they are found around the cities of Abidjan, Man and Yamoussoukro. In Ghana, major centers of population are found around the cities of Accra and Kumasi. In Ghana, human presence is evident (though often in low densities) across the majority of the hotspot but this is in contrast to other countries of this subregion, which retain large expanses of unpopulated land within the hotspot. Liberia has the lowest human presence within the hotspot, with much of the country remaining uninhabited. Similarly the Togolese and Beninese hotspot components also have low human presence, likely attributable to the high altitude of these areas compare with the rest of these countries. High population density areas tend to be focused in coastal areas.

In line with much of Africa, the hotspot countries showed some of the highest rates of population growth in the world in the early part of the 21st century. Twenty of the highest annual growth rates were in Africa and Liberia had the highest growth rate in the world in 2007 (4.8 percent). However, population growth in most hotspot countries appears to have slowed in recent years, and, although current census data are not available, most are now estimated to have rates of only a little above 2 percent per year (Table 5.2). Exceptions to this are Benin, Equatorial Guinea and Liberia, which all have been estimated to have current growth rates of more than 2.5 percent. Nigeria is the most populous country in Africa (and the 7th most populous in the world in 2013) and is predicted to have a population exceeding 250 million by 2030. Nigeria also has one of the highest population densities in the hotspot (180 people per km^2), exceeded only by São Tomé and Príncipe (191 people per km^2), which has a population of only around 200,000 but a very small land area. The capital district of São Tomé and Príncipe has a population density exceeding 4,200 people per km^2, and this is growing fast, making it among the highest densities recorded in the whole hotspot.

Table 5.2 Key Demographic and Ecological Footprint Measures for Countries in the Guinean Forests Hotspot

Country	Land Area (km^2, 2008 data)	Population Density (people per km^2, 2011 data)	Population in 2013 (millions)	Projected Population in 2030 (millions)	Annual Population Growth Rate 2000-2005 (%)	Estimated Annual Population Growth Rate 2010-2015 (%)	Ecological Footprint of Consumption (global hectares per capita, 2010)	Total Biocapacity (global hectares per capita, 2010)	Ecological Reserve (or Deficit) (global hectares per capita, 2010)
Benin	112,622	87	10.3	14.6	3.2	2.7	1.2	0.8	(0.4)
Cameroon	475,442	45	22.3	28.8	2.3	2.1	1.0	1.9	0.8
Côte d'Ivoire	322,463	61	20.3	29.8	1.7	2.2	1.0	1.7	0.7
Equatorial Guinea	28,051	26	0.8	1.1	3.1	2.7	2.4 approx.[1]	4.2 approx.[1]	1.8
Ghana	238,553	109	25.9	36.5	2.4	2.3	1.8	1.2	(0.6)
Guinea	245,857	45	11.8	15.9	1.6	2.5	1.7	2.8	1.1
Liberia	111,369	42	4.3	6.5	2.2	2.6	1.3	2.5	1.2
Nigeria	923,768	180	173.6	257.8	2.5	2.5	1.4	1.1	(0.3)
São Tomé and Príncipe	964	191	0.2	0.2	1.6	2.0	1.7 approx.[1]	0.75 approx.[1]	(0.95)
Sierra Leone	71,740	82	6.1	8.5	4.4	2.1	1.1	1.2	0.1
Togo	56,785	119	6.8	8.7	2.4	2.0	1.0	0.6	(0.4)
TOTAL	**2,587,614**	-	**282.4**	**408.4**	-	-	-	-	-

Source: UNEP (2008); World Bank (2013); Global Footprint Network (2010); UNDP (2013).

Note: 1 = figure read off graph for 2009.

Ecological Footprint: A measure of how much area of biologically productive land and water an individual, population or activity requires to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices. The Ecological Footprint is usually measured in global hectares (a productivity weighted area), which makes data and results globally comparable. For a city or a nation, it is simply the sum of the Ecological Footprint of all the residents of that city or nation. Because trade is global, an individual or country's Footprint includes land or sea from all over the world. Ecological Footprint is often referred to in short form as Footprint. Footprint varies each year with consumption and production efficiency. The global average is 2.7 global hectares per capita; the African average is 1.4 global hectares per capita.

Biological Capacity or Biocapacity: The capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans, using current management schemes and extraction technologies. "Useful biological materials" are defined as those demanded by the human economy. Hence what is considered "useful" can change from year to year. The biocapacity of an area is calculated by multiplying the actual physical area by the yield factor (a factor that accounts for differences between countries in productivity of a given land type) and the appropriate equivalence factor (a productivity based scaling factor that converts a specific land type into a global hectare). Biocapacity is usually expressed in global hectares. Biocapacity varies each year with ecosystem management, agricultural practices (such as fertilizer use and irrigation), ecosystem degradation, weather and population size.

Population density does not correlate with ecological footprint, however. For example, Nigeria has one of the highest population densities but only the sixth highest ecological footprint of the hotspot countries (Table 5.2). Nevertheless, when considering the ecological deficit or reserve of the hotspot subregions (i.e. by how much the footprint exceeds the biocapacity of the country), the five countries with the highest population density (Benin, Ghana, Nigeria, São Tomé and Príncipe, Togo) are also those which have an ecological footprint exceeding their biocapacity (Table 5.2). This suggests that, as the hotspot countries' populations continue to grow, their biocapacity will be exceeded or further exceeded, with unsustainable exploitation of natural resources. To account for the complex relationship between the growing human population densities and their associated environmental pressures, human demography has been considered as an underlying driver, rather than a direct threat to biodiversity, including in the review of threats (Chapter 8) and in the prioritization process used to define conservation outcomes (Chapter 4) and investment priorities (Chapter 12).

5.2.2 Urbanization and Migration Trends

The hotspot contains cities with populations of 500,000 or more. These comprise: Conakry in Guinea, Freetown in Sierra Leone, Monrovia in Liberia, Abidjan in Côte d'Ivoire, Kumasi in Ghana and Abeokuta, Ibadan, Benin City and Port Harcourt in Nigeria. Accra in Ghana, with a population of 2.3 million, is directly adjacent to the hotspot and depends heavily on the ecosystem services it provides.

Table 5.3 Rural versus Urban Populations, and Past, Present and Projected Future Rates of Change in the Urban Population for each Hotspot Country

Country	Population of Urban and Rural Areas at Mid-Year (thousands) and Percentage Urban in 2014				Average Annual Rate of Change of the Urban Population (per cent) for three time periods		
	Urban	Rural	Total	Percentage urban	2005-2010	2010-2015	2015-2020 (projected)
Benin	4,612	5,987	10,600	43.5	3.92	3.67	3.55
Cameroon	12,281	10,538	22,819	53.8	3.76	3.60	3.40
Côte d'Ivoire	11,126	9,679	20,805	53.5	3.27	3.69	3.39
Equatorial Guinea	309	469	778	39.8	3.04	3.12	3.09
Ghana	14,118	12,324	26,442	53.4	3.92	3.40	3.07
Guinea	4,418	7,626	12,044	36.7	3.76	3.82	3.73
Liberia	2,168	2,229	4,397	49.3	4.57	3.36	3.24
Nigeria	83,799	94,718	178,517	46.9	4.83	4.66	4.30
São Tomé and Príncipe	128	70	198	64.5	4.14	3.58	3.03
Sierra Leone	2,456	3,749	6,205	39.6	3.07	2.75	2.72
Togo	2,760	4,233	6,993	39.5	3.88	3.83	3.60
TOTAL	**138,175**	**151,622**	**289,798**	**47.7**	**-**	**-**	**-**

Source: United Nations, Department of Economic and Social Affairs, Population Division (2014).

Although figures specifically relating to the hotspot are not available, population data have been collated by the United Nations, Department of Economic and Social Affairs, Population Division

(2014). Almost all countries in the hotspot experienced significant increases in the percentage of their populations classed as urban, between 2000 and 2012. Moreover, these trends are projected to continue into the future (Table 5.3). Despite this, rural populations continue to grow, although percentages (mostly 50-60 percent rural) are lower than the Sub-Saharan African average.

Population increases (rural and urban) result from a combination of reproduction and inward migration. In Equatorial Guinea, for example, the urban growth rate was twice the overall population growth rate in 2006, driven by rural-urban migration and immigration of foreign oil workers. Rapid urban growth has social and ecological consequences. For example, in Conakry (Guinea), rapid growth caused by rural to urban migration and influxes of refugees (at least 600,000) from Liberia, Sierra Leone and Côte d'Ivoire have led to removal or degradation of most of the woody savannahs and mangroves around the city on the Kaloum Peninsula (CBD 2002 in UNEP 2008; FAOSTAT 2015). As urban population growth is predominantly driven by overall population growth, rather than rural-urban migration, pressures on environmental resources are likely to increase. Threats to biodiversity created by the population growth and urbanisation, as well as potential conservation solutions, are discussed in Chapter 8.

In West Africa, the southward movement of large populations of young men from countries north of the hotspot is the result of greater economic opportunity in countries such as Cameroon, Ghana and Liberia. At the same time, their place is being taken by (ex) pastoralists moving southward, to settle and cultivate, partly as a response to climate change in their rangelands of origin (Barrios *et al.* 2006, Warner *et al.* 2009). With the effects of climate change increasingly being felt, this southerly migration pattern is likely to be exacerbated.

Three hotspot countries (Côte d'Ivoire, Liberia and Sierra Leone) have experienced major conflicts and civil war in the last 20 to 25 years. These have had impacts not just on the countries directly affected but also across the whole region. An estimated 250,000 people have been killed in the Liberian civil wars, and more than a third of the population displaced to neighboring countries (Insight on Conflict 2014). The Sierra Leone civil war saw approximately 70,000 casualties and 2.6 million people displaced (UNDP 2006). Since 2009, activities of the jihadist group, Boko Haram, have also caused displacement of people from northern Nigeria and have affected areas of northern Cameroon. The directly affected areas do not, at the time writing, extend within the hotspot boundary. All forms of unrest and conflict, even on smaller scales, can lead to serious internal and trans-boundary consequences, with mass migrations of refugees and greatly increased population densities in new, informal settlements and camps. This can result in serious land and resource degradation in areas with natural resources and infrastructure too limited to cope with high local population densities. High levels of environmental degradation can also lead to social and political breakdown and conflict (van Schaik and Dinnissen 2014).

5.2.3 Economic Development

Table 5.4 presents economic data for the hotspot countries. Among these countries, Cameroon, Côte d'Ivoire, Ghana, Nigeria and São Tomé and Príncipe are ranked as lower middle income countries (World Bank income groups based on Gross National Income (GNI) per capita, Atlas method) and Equatorial Guinea has upper middle income status (although there are no current data on the percentage of the population below the income poverty line). The other hotspot countries (Benin, Guinea, Liberia, Sierra Leone and Togo) are all low income and most have high proportions of their populations below the income poverty line (USD 1.25 per day in 2011) and/or the national poverty line. However, some higher income countries also have very high proportions of the population below these thresholds (e.g. Nigeria: 68 percent of population below the income poverty line). The Income Gini coefficient is a measure of inequality in income distribution and most hotspot countries have Gini coefficients around or over 40 percent, indicating relatively large income inequalities. There is no evidence to suggest that poorer populations rely more on natural resources and hence have greater environmental impact.

Table 5.4 Economic Indicators for the Hotspot Countries

Country	GNI per Capita, Atlas Method (USD, 2012 data)	World Bank Income Group (2012 data)	% Population below Income Poverty Line of USD 1.25 per day (2002-2012 data)	Income Gini Coefficient (2000-2010 data)
Benin	750	Low	47.3	38.6
Cameroon	1,170	Lower middle	9.6	38.9
Côte d'Ivoire	1,220	Lower middle	23.8	41.5
Equatorial Guinea	13,560	Upper middle	No data	No data
Ghana	1,550	Lower middle	28.6	42.8
Guinea	440	Low	43.3	39.4
Liberia	370	Low	83.8	38.2
Nigeria	1,440	Lower middle	68.0	48.8
São Tomé and Príncipe	1,310	Lower middle	No data	50.8
Sierra Leone	580	Low	51.7	42.5
Togo	500	Low	28.2	34.4

Source: World Bank (2103); UNDP (2014).

The main drivers of economic growth in the region are trade (Ghana), agriculture (Benin, Côte d'Ivoire, Togo, São Tomé and Príncipe), the tertiary sector including transport (Cameroon), oil and gas production (Equatorial Guinea, Nigeria), and mining (Guinea, Liberia, Sierra Leone) (World Bank 2015a). All of the hotspot countries apart from Cameroon, Equatorial Guinea and São Tomé and Príncipe are members of the Economic Community of West African States (ECOWAS).

5.2.4 Human Development

Table 5.5 shows development indicators for the 11 hotspot countries. In terms of the Human Development Index (a composite indicator of life expectancy, educational attainment and command over resources needed for a decent standard of living), all hotspot countries rank among the lowest in the world, despite considerable recent advances. In the hotspot, Ghana and São Tomé and Príncipe are the two highest ranked countries (138 and 142 respectively), while Guinea (179) and Sierra Leone (183) are the lowest ranked (out of 187 countries). This is also reflected in the stagnation in attainment of the Millennium Development Goals (MDGs) in the region, undermined by poor governance and the current Ebola outbreak. With the exception of

Ghana, Benin, Cameroon and Côte d'Ivoire, more than 50 percent of the populations of hotspot countries are living below the national poverty line.

Table 5.5 Development Indicators for the Hotspot Countries

Country	Life Expectancy at Birth (both sexes) (years, 2013 data)	% Population below National Poverty Line (2002-2012 data)	Infant Mortality Rate (per 1,000 live births) (2013 data)	Adult Literacy Rates (%, 2005-2010 data)	Human Development Index (HDI) score (2013 data)	HDI Global Rank (2013 data)	Improvement in HDI rank (2007-2013 data)
Benin	59	39.0*	70	42.4	0.48	165	-3
Cameroon	54	39.9*	62	70.7	0.50	152	1
Côte d'Ivoire	50	42.7*	68	56.2	0.45	171	-3
Equatorial Guinea	52	76.8**	65	93.9	0.56	144	-5
Ghana	61	28.5	53	67.3	0.57	138	7
Guinea	56	53.0*	67	41.0	0.39	179	-3
Liberia	60	63.8	63	60.8	0.41	175	3
Nigeria	52	54.7	97	61.3	0.50	152	2
São Tomé & Príncipe	66	66.2	44	89.2	0.56	142	-1
Sierra Leone	45	66.4	128	42.1	0.37	183	2
Togo	56	61.7*	69	57.1	0.47	166	-1

Source: UNDP (2014); Population Reference Bureau (2013).
Notes: * = Estimates based on surveys 2002-2006. ** = National data from 2006.

The Global Hunger Index, which combines three weighted indices of undernourishment, proportion of children underweight and child mortality, is falling in all countries, yet remains high, with Sierra Leone categorized as having 'Alarming' hunger levels, and all other countries except Ghana having 'Serious' ones (Table 5.6).

Table 5.6 Global Hunger Index and Gender Inequality Index Values for the Hotspot Countries

Country	Global Hunger Index Scores	Hunger Index Category	Gender Inequality Index	Gender Inequality Index Rank
Benin	13.3	Serious	0.614	134
Cameroon	14.5	Serious	0.622	138
Côte d'Ivoire	16.1	Serious	0.645	143
Equatorial Guinea	No data	No data	No data	No data
Ghana	8.2	Moderate	0.549	123
Guinea	16.9	Serious	No data	-
Liberia	17.9	Serious	0.655	145
Nigeria	15.0	Serious	No data	No data
São Tomé and Príncipe	No data	No data	No data	No data
Sierra Leone	22.8	Alarming	0.643	141
Togo	14.7	Serious	0.579	129

Source: von Grebmer (2013), UNDP (2014).

Ghana was the only country in Sub-Saharan Africa among the top 10 improvers worldwide in 2013 for the Global Hunger Index, based on improvement since 1990 (von Grebmer *et al.* 2013). Access to services (health services, clean water and sanitation) is improving across the hotspot in rural and urban areas, although many rural populations and slum dwellers in uban areas still have very limited access to them.

The Gender Inequality Index is a composite measure reflecting inequality in achievements between women and men in three areas: reproductive health; empowerment; and the labor market. Countries in Sub-Saharan Africa perform worse than those in all other regions on earth and this is the pattern for the hotspot countries, which, despite some improvements from 2000 to 2013, have some of the lowest Gender Inequality Index ranks in the world (UNDP 2014). This is largely due to high maternal mortality and adolescent fertility rates and huge gaps in educational attainment. In an analysis of 72 countries on the IUCN Environment and Gender Index (IUCN 2013), Ghana was the only hotspot country assessed as a moderate performer and Liberia and Cameroon fell into the category of weakest performance. Gender inequality is especially pertinent to conservation activities (see Al-Azzawi 2013, FFI 2015, IUCN 2015b, WWF 2015), and the impact of gender inequality as relates to conservation in West Africa is discussed by Anoko (2008). Impacts can include male-driven exclusion of women from conservation initiatives and loss of female held natural resource knowledge due to exclusion of women (for deeper discussion and analysis see the above works). Aspects of poverty, gender and local livelihoods are discussed in more detail in relation to communities, forest use and non-cash economies in Section 5.4.2.

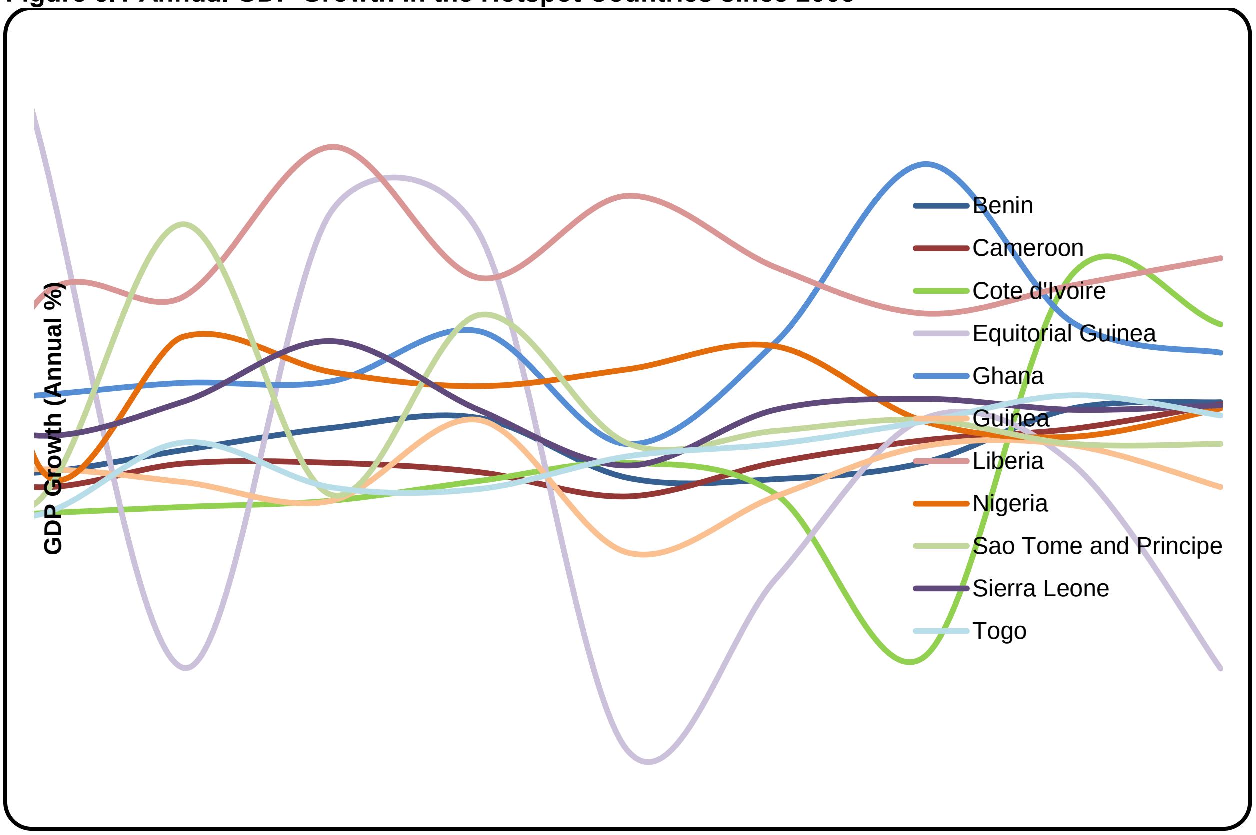
5.3 Economic Trends

5.3.1 Key Recent Economic Trends

For Sub-Saharan Africa as a whole, economic growth was strong in 2013, with real Gross Domestic Product (GDP) growth of 4.7 percent; the second fastest growing region world-wide in 2013. It should be noted, however, that there is a large range of growth patterns in the hotspot countries, with some countries (e.g. Equatorial Guinea) showing very erratic patterns in GDP growth (Figure 5.1). This is largely due to fluctuations in key export prices (e.g. oil); the Ebola crisis has also had an impact on economic growth in the region. There has been much foreign investment in oil, gas and mining exploration and development but service sectors, such as telecommunications, finance, retail and transport, are also expanding rapidly in many countries, as consumer incomes rise and domestic demand increases.

During the global financial crisis of 2008-2009, developing country economies, including hotspot countries, were less affected than those of developed nations and larger economies. This was largely because their economies were not as linked into global financial markets. This is reflected in the emergence of a rapidly growing, though still small, middle class. Coupled with this is a massive increase in consumption and domestic consumer expenditure in the ‘Global South’, including hotspot countries. There have been exponential rises in internet use and connectedness within and between countries and increasing ‘South-South’ trade. Entrepreneurship and new business models are developing, for example the use of mobile phones for banking, money transfer, paying bills, obtaining information on weather, farming and commodity prices, and provision of business services. South-South trade in the region is, however, still hampered by barriers to integration, such as inadequate transportation and energy infrastructure and non-complimentary production structures (Chete 2012, IMF 2013). In many countries, governments continue to emphasize North-South trade.

Figure 5.1 Annual GDP Growth in the Hotspot Countries since 2005



Source: World Bank (2015a).

Large flows of Foreign Direct Investment (FDI) are making very substantial contributions to growth in hotspot countries (e.g. an estimated 0.9 percent of total growth in Nigeria between 2003 and 2009). Increasing amounts of this FDI comes from state-owned and private in China, which also provides preferential loans, training and joint business support to sectors including garments and textiles, telecommunications, pharmaceuticals, electronics and construction (UNDP 2013, UNCTAD 2014). Using agreements such as 'infrastructure for oil', China has become a major funding source for infrastructure developments in Africa (PwC 2014). Such investments can be seen in throughout the hotspot, such as the construction of a new USD 200 million international airport in Sierra Leone by the China Railway International Company (to be constructed near Freetown, inside the hotspot) and the contracts won by Huawei to provide mobile phone service in Nigeria (PwC 2013). There is no discernible information on which KBAs are impacted. It should be noted that between 2007 and 2013 only 4.2 percent of FDI in Africa originated from China, with the majority coming from the US, UK and UAE (EY 2014). India is also growing in its importance in terms of FDI in Africa as a whole.

Foreign investment in Sub-Saharan Africa also includes the acquisition of very large land areas, particularly for the development of agro-industries such as biofuel production. This is a concern where environmental and social standards and governance are weak, and the ecosystem benefits of existing intact and low intensity managed landscapes are not valued. Rural communities often have the most to lose and have little ability to be heard in negotiations or in the awarding of leases at national level. For example, British companies had acquired more than 3.2 million hectares of land for biofuels in Africa by 2011, including concessions in Ghana, Guinea and Liberia (The Guardian 2011). Such developments can be seen as welcome investment in the agriculture sector (FAO 2009) or as a major threat, which may go against the interests of the local communities (Cotula 2011; Zagerma 2011). In São Tomé and Príncipe, there have been two major recent concessions granted: 5,000 hectares to the French-Belgian company Socfinco (locally registered as Agripalma) to grow oil palm and 2,500 hectares to the French-Swiss company SATOCAO to produce cacao. Although seemingly small, these areas represent nearly 10 percent of the island of São Tomé, which is already crowded and heavily dependent on imported food.

5.3.2 Main Economic Sectors

Agriculture

Agriculture is a major economic sector in all countries. Agricultural expansion to feed a growing population and for commercial export development is the most significant contributor to land-use change and deforestation across the hotspot and, hence, is the major pressure on species, site and corridor outcomes (see Chapter 8). As much as 80 percent of the original West African rainforest may now be an agriculture-forest mosaic (Norris *et al.* 2010), although patterns of human influence on forest change are variable across the hotspot and subject to different interpretations (see Section 5.4). Agriculture makes significant contributions to national GDP (from a 21 percent share in Guinea to 57 percent in Sierra Leone), as well as to employment (more than 40 percent of the labor force in most hotspot countries, around 60 percent in Equatorial Guinea, Liberia and Sierra Leone and 80 percent in Guinea).

In the hotspot, agriculture takes many different forms, ranging from low intensity, traditional cultivation and grazing, to intensive, commercial crop growing and plantations, for both urban and export markets. Most rural populations supply both their own needs and a proportion of the urban demand for cassava, maize and beans, meat, wood fuel and charcoal. Urbanization increases local demand that has to be supplied from rural areas, and drives the conversion of more agricultural land in the absence of technologies for the intensification of land-use (Norris *et al.* 2010).

There is great variation among hotspot countries with regard to the proportion of land used for arable and permanent crops (excluding land used for livestock grazing). In Togo, for example, 80 percent of potential arable land is already being used and severe land degradation is occurring in the absence of affordable fertiliser or effective composting techniques (UNEP 2008). There is also wide variation in the top commodities grown (by land area). Cacao and other significant export crops, such as oil palm and rubber, are usually grown as single species monocultures and plantations.

The significance of cacao, especially in Cameroon, Côte d'Ivoire, Ghana and São Tomé and Príncipe is shown in Appendix 5. In Côte d'Ivoire, one third of the population depends on cacao cultivation (in 2011, nearly 1.1 million tonnes of cacao beans were exported and cacao beans and their products accounted for over 60 percent of total export revenues; FAOSTAT 2015). Even though much smaller in scale, cacao is the most important cash crop in São Tomé and Príncipe, and most of the islands' low altitude forests were cleared to make way for expansion of cacao farming during the last century (UNEP 2008). Commonly, small-scale producers sell to export companies. Due to the nature of the crop, large scale production by private companies is less successful than smallholder cultivation. However, the low productivity of smallholder agriculture in the hotspot has led to an expansion of area under cultivation. It has been postulated that a switch to more intensive cacao farming methods in the 1960s could have averted over 21,000 km^2 of deforestation and degradation and the emission of nearly 1.4 billion tonnes of CO_2 (Gockowski and Sonwa 2011). It should also be noted that some areas in the hotspot (e.g. the Kwahu Plateau in Ghana and southwestern Côte d'Ivoire) are predicted to become more suitable for cacao production under climate change scenarios (Läderach *et al.* 2013), potentially stimulating further expansion of agriculture.

Main exporters of cacao include Cargill in Ghana and Côte d'Ivoire, ADM in Côte d'Ivoire (under the UNICAO brand), and Cacao Marketing Company and Cacao Processing Company in Ghana. Cargill and ADM have their own sustainability schemes (the 'Cargill Cacao Promise' and ADM's SERAP programme), both certified by UTZ. Individual smallholders or co-operatives are certified by consumer-recognised schemes, such as Rainforest Alliance (with certified farms in Cameroon, Côte d'Ivoire, Ghana, Nigeria and Togo) and Fairtrade (with certified cooperatives in Côte d'Ivoire and Ghana). In recent years, São Tomé and Príncipe has also invested in creating cooperatives to export certified organic cacao and coffee, spices and fairtrade cacao. The implementation of these projects has brought benefits to rural populations, by offering support and a better payment to small scale farmers, but their impact on the forests is difficult to assess. Cacao is normally produced in areas that have been cleared a long time ago, and the stabilization of the price might reduce pressure on forest resources (R. Lima pers. comm.). The indirect supply chain of cacao (i.e. the existence of intermediary exporters) makes it difficult to directly connect major international end-product manufacturers with in-country impacts.

When world cacao prices decrease, countries compensate for declines in foreign exchange earnings by increasing other export sectors (e.g. timber and minerals in the case of Ghana). Cacao farming can therefore be both a direct and indirect driver of deforestation and forest degradation.

Together with the Democratic Republic of Congo, Cameroon, Côte d'Ivoire, Ghana and Nigeria are the largest producers of palm oil in Africa, responsible for 72 percent of Africa's total oil palm production in 2013 (FAOSTAT 2015); figures for 2013 production for the hotspot countries are shown in Table 5.7. Major private sector producers operating in the hotspot include Presco Plc (a subsidiary of the Belgian Siat Group), Okomu Oil Palm Company Plc. (in Nigeria), Dekel Oil (in Côte d'Ivoire), Ghana Oil Palm Development Company Ltd. (a subsidiary of the Belgian Siat Group), Twifo Oil Palm Plantations Ltd., Benso Oil Palm Plantations Ltd. (Ghana), SOCAPALM, SAFACAM (both part of the SOCFIN group), Swiss Farm, Cameroon Development Corporation and PAMOL (Cameroon), Agripalma (São Tomé and Príncipe) (also part of the SOCFIN group). There is strong pressure for expansion of production to supply increasing demand from China, India and European and North American markets. There are currently five large companies (French, Swiss and Cameroonian) involved in industrial palm oil production in Cameroon, and six further multi-nationals believed to be trying to secure more than 1 million hectares of land for palm oil production in the southern forested zone. This expansion in Cameroon has potential for achieving poverty reduction, infrastructure expansion, state revenues and smallholder support but there are also risks, including loss of forest and farmland for local communities (Hoyle and Levang 2012). The Siat Group and Benso Oil Palm Plantation have Roundtable for Sustainable Palm Oil (RSPO) certified plantations in Ghana. Agripalma plantations (operating on São Tomé and Príncipe) are also trying to get RSPO certification but may have to pay large compensation for having cleared high conservation value forests. In addition, Unilever (a global buyer of palm oil) has partnered with Solidaridad (an international CSO) to implement a sustainability initiative in West Africa (including hotspot countries).

Table 5.7 Oil Palm Production in the Hotspot Countries

Country	Production in 2013 (thousands of tonnes)	% of Production in Hotspot Countries	% of Production in Africa
Benin	56	2.9	2.4
Cameroon	225	11.6	9.5
Côte d'Ivoire	415	21.3	17.4
Equatorial Guinea	5.5	0.3	0.2
Ghana	120	6.2	5.0
Guinea	50	2.6	2.1
Liberia	43.5	2.2	1.8
Nigeria	960	49.3	40.3
São Tomé & Príncipe	3.5	0.2	0.1
Sierra Leone	60	3.1	2.5
Togo	9	0.5	0.4

Source: FAOSTAT (2015).

Forestry

In most hotspot countries, forestry departments in colonial times established extensive networks of reserves to be managed for production or conservation, though many of these "forest reserves" have not been managed or protected effectively and many now contain little or no forest. Forestry as a production sector can be divided into two broad categories. The first category includes large-scale, commercial logging and timber extraction, including exploitation of natural and semi-natural (i.e. secondary) forest, and plantation forestry. The second includes smaller-scale, local or artisanal exploitation for local use and domestic markets (e.g. poles, fuel wood, charcoal and NTFPs). For maps of forest loss see Chapter 8.

Commercial Logging from Natural Forest

Production forestry and commercial timber logging were large industries in many hotspot countries in colonial times. Forests were also cleared to make way for cacao production, especially in Ghana, São Tomé and Príncipe and Côte d'Ivoire. Timber is no longer a major export commodity for most of the countries, with the exception of Benin, Cameroon and Equatorial Guinea (Observatory of Economic Complexity 2015) and better forest management and more selective felling methods used on some plantations have reduced the direct threats to forests and wildlife from the sector. However, the secondary effects (such as increased hunting using logging roads) remain serious threats to biodiversity (see Chapter 8).

Cameroon is now the only hotspot country in which timber is a top commodity export by value (UNdata 2015). Large logging enterprises in Cameroon consist of GRUMCAM (a subsidiary of Italian owned ALPI), PALLISCO (a subsidiary of French PASQUET Group), CFC and CUF (both Cameroonian companies) (ITTO 2009). Cameroon has a history of weak regulation and management of logging concessions, and illegal logging (large and small-scale) is still a widespread problem here, as well as in Côte d'Ivoire. Due to the illicit nature of such activities, there is no data on any specific KBAs that this might be affecting. However, Mount Lefo (CMR13), Omo Forest Reserve (NGA11) and Afi River Forest Reserve (NGA1) are all known to be under threat from logging. In 2009, there was a total of 6.4 million hectares of forest under concession in Cameroon (equivalent to 34 percent of the country's total forest area) and the official export sector accounted for 343,000 m^3 of sawn wood. However, 'official' export volumes are dwarfed by those extracted by 'informal' chainsaw milling 662,000 m^3 and for domestic markets 860,000 m^3. The informal sector is hugely important to rural economies and provides thousands of jobs but is largely unregulated.

More selective and sustainable approaches to forest management and exploitation are being adopted in most countries, such as adoption of sustainable forestry policies and creation of conservation concessions. In 2010, five concessions were certified by the sustainability certification scheme of the Forest Stewardship Council (FSC), with more under consideration (ITTO 2011). The market demand for certified wood indicates that other producers may move towards certification and good management practices.

Plantations
Forestry plantations were mainly introduced under colonial rule, when colonists planted fast growing trees such as pine and eucalyptus. From the mid-20th century onwards, plantations increased, mainly with support from international agencies such the World Bank (Jacovelli 2014). Previously run mainly by state forestry departments, plantations are now mainly privately owned enterprises. Ghana and Côte d'Ivoire are the two main hotspot countries involved in plantation forestry, with 260,000 and 377,000 hectares respectively, although Ghana has received more focus from investors, such as Africa Plantations for Sustainable Development, Siricec, and Miro Forestry Co. (Jacovelli 2014). The main species cultivated are *Tectona grandis* and *Terminalia sp.* The Miro Forestry Co, *T. grandis* plantations are within the hotspot in Boumfoum, Ghana; the exact locations of other plantations are unavailable.

Rubber is a major export commodity by value in Liberia (USD 260 million), Côte d'Ivoire (USD 946 million) and Nigeria (USD 2,643 million), though much less important than cacao and petroleum products. In Liberia, more than 57,000 hectares of forest have been converted to monoculture rubber plantations. Major producers include Firestone (with a plantation near Harbel, a subsidiary of Japanese owned Bridgestone), Liberia Agricultural Company (with a plantation near Buchanan, part of the SOCFIN group), Guthrie (with a plantation near Baha, a subsidiary of Sime Darby), and Liberia Company (with a plantation near Cocopa) (VERITE 2011). There is little research examining the environmental impact of African rubber plantations, although known impacts include surface water pollution by chemical waste from rubber plantations. The wider impacts of large-scale rubber plantations are likely to be similar to thos of palm oil plantations, i.e. loss of biodiversity, soil degradation, etc., due to forest clearance to accommodate plantations.

Small-scale Exploitation: Fuelwood, Charcoal, Mangroves
Fuelwood and charcoal represent 90 percent of all wood harvested from African forests (79 percent in Cameroon and 31 percent in Equatorial Guinea in 2009; de Wasseige *et al.* 2012). All hotspot countries show very high dependence on fuelwood (e.g. 95 percent of the population in Benin and 85 percent in Sierra Leone). In Benin, total production is estimated at over 6 million m^3 of fuel wood annually (UNEP 2008). Mangroves are particularly vulnerable to over-exploitation for poles and charcoal, especially as they occur along the coastal fringe of the hotspot where the highest population densities and urban centres are found. The interactions between communities and forests are considered in more detail in Section 5.4.

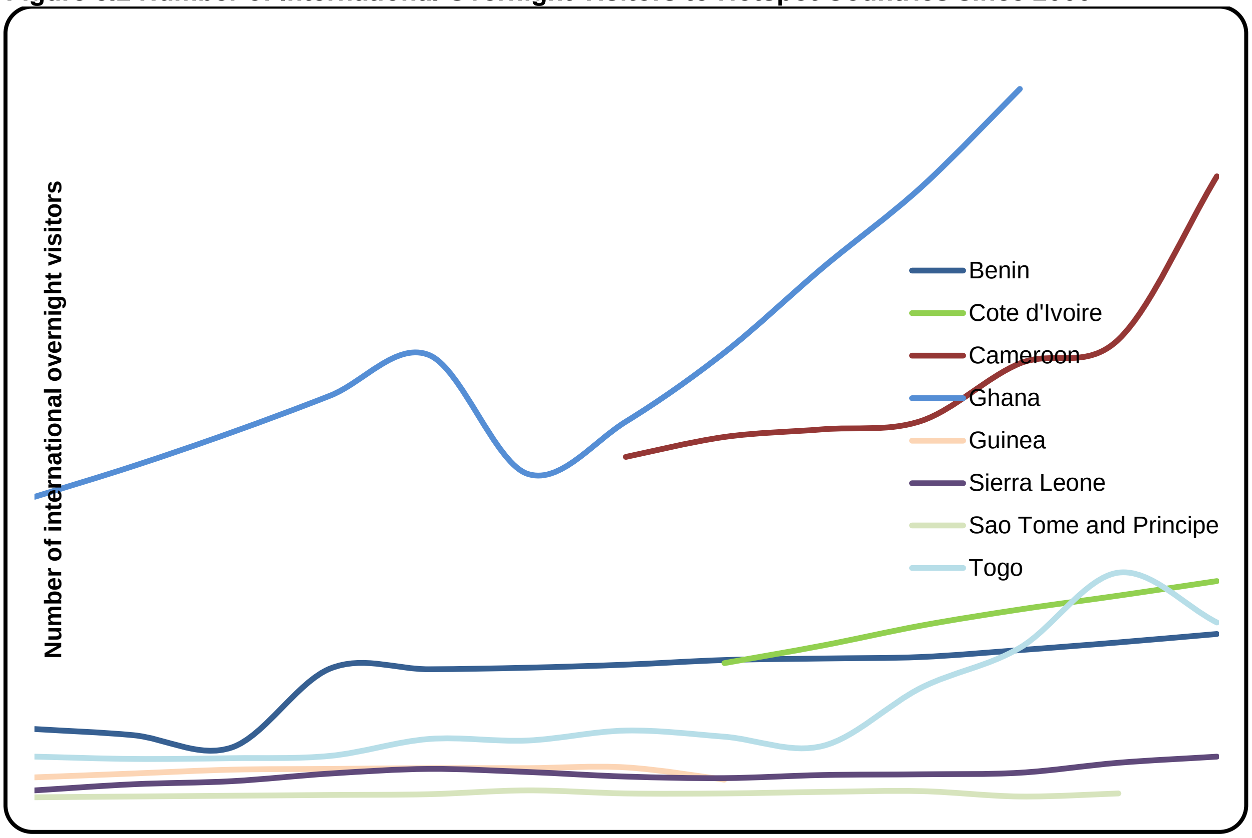
Guinea's coastal mangrove forests contain around 25 percent of all West African mangroves, which are a crucial resource for local economies. Increasing use for a variety of purposes (e.g. salt production, which used 93,000 tonnes of firewood from mangroves in 2002), coupled with coastal development pressure due to expanding populations in and around Conakry, threatens mangrove ecosystems. Over-exploitation in turn leads to declines in the ecosystem benefits and productivity they support.

Tourism
No tourism data exists for Equatorial Guinea or Liberia. The remaining hotspot countries have seen an increasing trend in tourist numbers since 2000 (Figure 5.2), although numbers are still much lower than other countries in the region, and form a small proportion of Sub-Saharan African figures (40.3 million in 2012). Nigeria is an exception to this, with tourist figures much higher than the other hotspot countries, with 4.7 million in 2012.

In the hotspot, Guinea, Liberia, Togo and Equatorial Guinea are classified as "Pre-emerging" in terms of their level of tourism development; Benin, São Tomé and Príncipe, Sierra Leone, Côte d'Ivoire, Cameroon and Nigeria as "Potential/initiating", and Ghana as "Consolidating/maintaining and deepening success" (Christie *et al.* 2013).

Several hotspot countries have suffered decades of civil unrest, making international tourism largely impossible. The recent Ebola outbreak has also negatively affected tourism. However, countries like Sierra Leone and Liberia have attractive forests, wildlife and landscapes, pristine beaches and interesting cultural heritage, music and food. Others countries like Ghana, Nigeria and Cameroon offer ecotourism products with wildlife-viewing opportunities and established national tour operators, coupled with cultural history and sophisticated accommodation and facilities in capital cities. Since the cessation of the various civil wars in the region (see Section 5.2.2), ecotourism initiatives have begun to increase in number. One example is the Tiwai Island initiative in Sierra Leone, which was restarted in 2003 with the aim of encouraging support for conservation in local communities and bringing external scientific and recreational visitors to the area. Other ecotourism initiatives include the Banana Islands and John Obey Beach in Sierra Leone, the Volta region in Ghana and various sites throughout the parts of the hotspot in Togo and Benin.

Figure 5.2 Number of International Overnight Visitors to Hotspot Countries since 2000



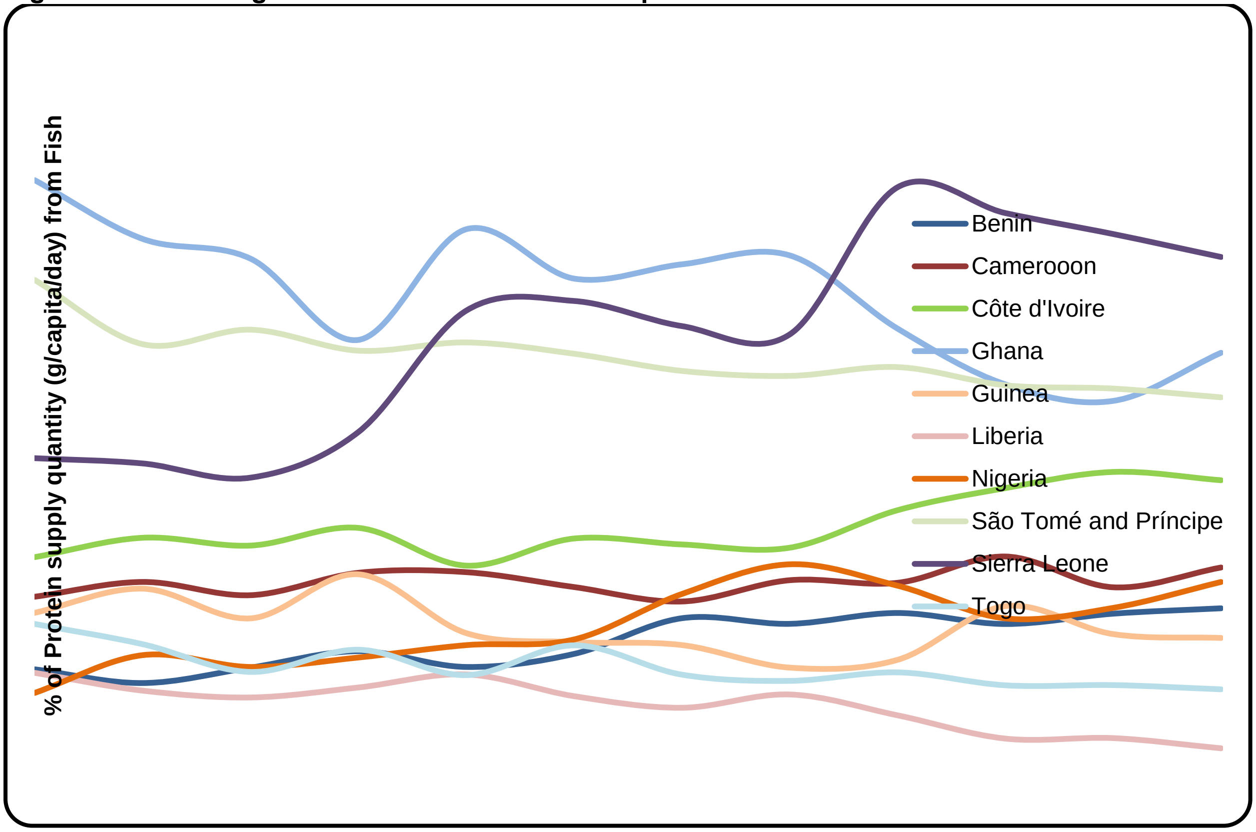
Source: World Bank (2015a).
Only countries with available data are shown; Nigeria is omitted because it had visitors greatly in excess of those of other hotspot countries (e.g., Nigeria had 4,463,000 visitors in 2012).

These initiatives feature a combination of community-based home-stays and more established businesses with links to local communities. However, many of these ecotourism initiatives are likely to suffer from relatively low-visibility in the world market and poor access and hospitality infrastructure, as well as a likely continued reduction in tourism to the hotspot for the short-term due to the Ebola outbreak. Low visitor numbers were listed as a concern by the local communities in the Tiwai Island initiative (Environmental Foundation for Africa 2006). It should also be noted that there are a number of operators and government tourism websites which use the term 'ecotourism' to refer generally to wildlife/nature/environment based tourism, and therefore do not meet the definition of ecotourism as laid out the International Ecotourism Society (i.e. "improves the welfare of local people").

Fisheries

Protein from fish makes up a large proportion of the total protein from fish and livestock sources in the hotspot countries (Figure 5.3). The hotspot countries with the largest dependence on fish protein are Ghana, São Tomé and Príncipe and Sierra Leone. São Tomé and Príncipe is surrounded by water and Ghana has a large freshwater fishery. People in coastal areas tend to be more reliant on fish protein, which constitutes between 40 and 80 percent of total annual protein consumed per capita (IGCC 2006).

Figure 5.3 Percentage of Protein from Fish in Hotspot Countries since 2000



Source: FAOSTAT (2015).
Note: Equatorial Guinea is omitted as there are no data available for this country.

Table 5.8 Percentage Point Difference in Daily Protein Consumption (grams of protein per capita per day) from Different Sources between 2007 and 2011

Country	Fish, Seafood	Meat	Milk (Excluding Butter)	Cereals (Excluding Beer)	Pulses	Starchy Roots
Benin	0.4	3.1	-0.1	-1.3	-3.8	0.9
Cameroon	0.5	-0.6	-0.1	-0.3	0.5	-0.3
Côte d'Ivoire	1.5	-0.3	0.2	-0.5	0.2	-2.2
Ghana	-3.3	0.7	0.0	2.0	0.9	-2.1
Guinea	1.1	0.2	0.2	1.0	-1.4	-0.7
Liberia	-1.7	3.4	-0.3	2.0	-0.9	-2.3
Nigeria	-0.6	0.4	-0.6	0.4	-0.4	1.5
São Tomé & Príncipe	-0.7	2.6	-1.8	-0.5	0.7	0.2
Sierra Leone	2.6	0.9	0.1	-2.6	-2.7	0.4
Togo	-0.2	1.2	-0.2	-1.1	0.5	-0.7

Source: FAOSTAT (2015).
Notes: Equatorial Guinea is excluded from the table as there are no data from this country. 2011 is used because it is the most recent year with data. Only those food groups for which one or more countries showed a change equal to or greater than one percentage point are shown.

In the last five years for which there are data (2007-2011), five countries (Ghana, Liberia, Nigeria, São Tomé and Príncipe and Togo showed a decrease in the percentage of protein in the diet originating from fish (Table 5.8). In Liberia, São Tomé and Príncipe and Togo this is attributable to an increase in dietary protein originating from meat, whereas in Ghana and Nigeria the deficit is met by an increase in consumption of cereals and starchy roots, respectively. The drop in consumption of fish protein is likely to be driven by a combination of dwindling fish stocks due to overfishing (see below) and an increase in the availability of meat. In Ghana especially the reduction in fish consumption per capita is more likely to be due to a switch in consumer preference, as Ghana is one of the best performing of the hotspot countries in terms of economic and development indicators (see Section 5.2).

Of the 11 hotspot countries, seven have a marine or freshwater product as one of their top 20 exports (see Table 5.9). However, the percentage share of the total exports for these products is low (between 0.28 and 3.1 percent), indicating that their main importance to the economy is as a food source for the local population, rather than as an export commodity.

Table 5.9 Value of Fish and Marine Product Exports by the Hotspot Countries

Country	Export product	In-country Ranking in Terms of % of Total Exports	Value (USD)	% of Total Exports
Côte d'Ivoire	Processed Fish	12	186,544,747	1.5
Ghana	Processed Fish	8	150,894,900	0.92
Guinea	Non-fillet Frozen Fish	7	43,310,720	3.1
	Processed Fish	13	6,988,835	0.49
Liberia	Fish Fillets	14	2,517,095	0.27
Nigeria	Crustaceans	9	349,405,301	0.28
Sierra Leone	Crustaceans	18	2,128,140	0.28

Source: Observatory of Economic Complexity (2015).

Freshwater

Freshwater river systems in the hotspot are highly productive, and it is frequently the poorest communities who rely most directly on freshwater resources (particularly fish and crustaceans) as sources of protein. Nearly 14 percent of the land area in Liberia consists of fresh water and fisheries provide over half the overall population's protein intake and 10 percent of GDP (UNEP 2008). Many rivers are seasonal and artisanal fishing takes place on floodplains in rivers and seasonal pools, which also function as fish breeding, nursery and shelter areas. Lake Volta is the most important inland fishery in Ghana (with around 140 species of fish, many exploited commercially for sale in markets) but over-fishing has resulted in stagnation of the commercial fishery. Reduced water levels (probably due to erosion and siltation associated with operation of a hydropower dam) also contribute to declines in fish numbers (UNEP 2008) and water pollution can exacerbate this issue.

Marine and Coastal

More than 30 percent of people in the Gulf of Guinea countries live on or near the coast (100 percent are considered coastal residents on the offshore islands). There are large-scale industrial and artisanal fisheries in all countries in the hotspot, with artisanal fisheries contributing 70 percent of total fishery production (Koranteng *et al.* 1998).

Most fishing (industrial and artisanal) takes place relatively close to shore, at depths of less than 100 meters, and is poorly regulated. Both fisheries also target two main groups of resources: small and large pelagics; and demersal species. Sharks are also targeted in deeper water for their fins. Catch and effort data are not well recorded and monitored but Nigeria and Ghana have the highest reported proportions of regional catches overall (23 and 16 percent, respectively).

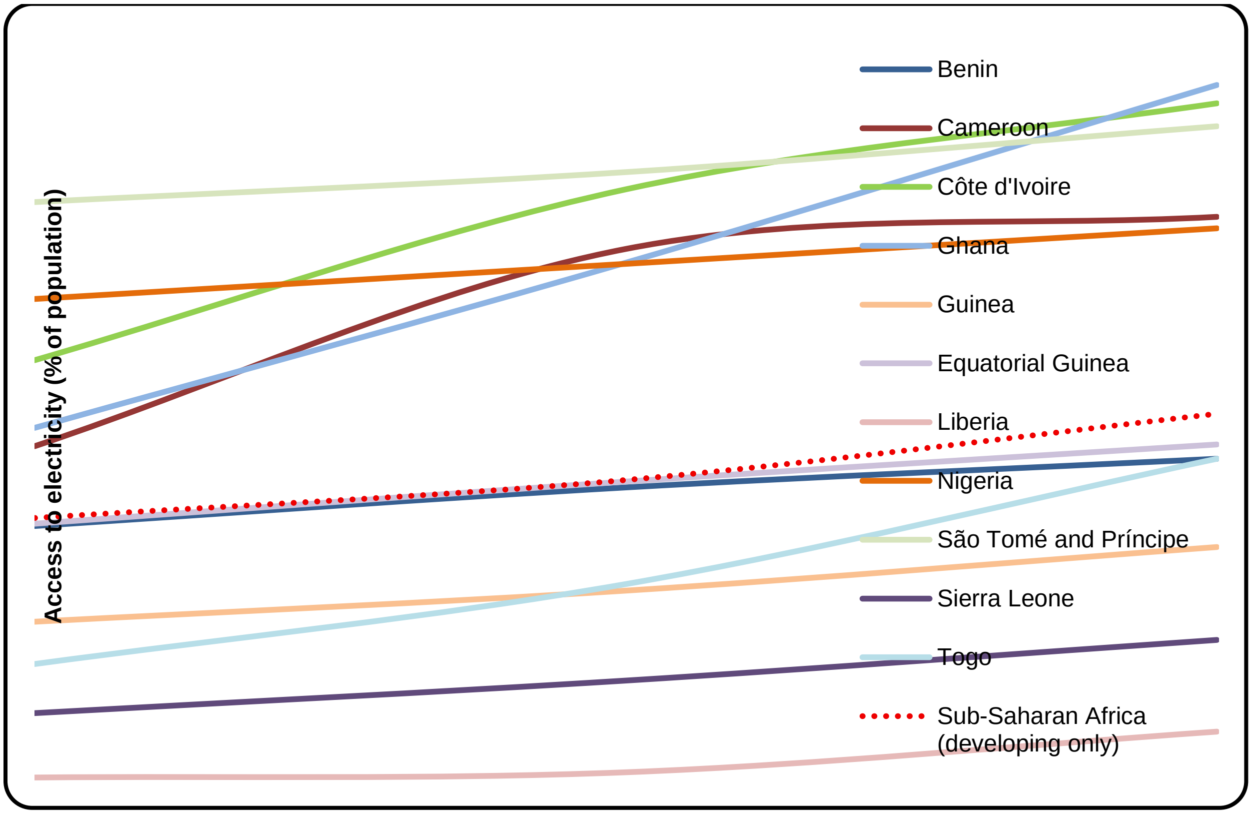
Industrial fishing is highly globalized, as foreign fleets operate offshore throughout the Gulf of Guinea, in addition to national fleets. Large foreign offshore trawlers originate from European nations, as well as Korea and Japan. The numbers of industrial trawlers in the region have been estimated to be too high in relation to available biomass. For example, 50 boats were operating off Cameroon and 400 trawlers off Nigeria (IGCC 2006). In addition, it is estimated that, in West Africa, two million individuals rely on small-scale fisheries as their primary source of income, and another six million depend on fishing resources as part of a diversified livelihood (WASSDA 2008). In Ghana alone, there are an estimated 10,000 artisanal vessels and 170 industrial vessels, which employ more than 200,000 individuals directly, and provide more than 1.5 million jobs in related fishery sectors (FAO 2014). It has been noted that the amounts paid to countries for access to their marine waters for fishing are far below the value of the fish stocks removed from their territorial waters. Bottom-up re-estimations of catches also suggest that foreign vessels drastically underreport their catches in the region (Pauly *et al.* 2014; Belhabib *et al.* 2015). It is likely that decreases in catches caused by overfishing will prompt artisanal and small-scale fishers to move to other territorial waters, as already seen in Senegal (Belhabib *et al.* 2014).

Aquaculture
West Africa is currently responsible for only a very small percentage of the world's aquaculture production (approximately 0.3 percent in 2013; FAOSTAT 2015). However, since 2000, the output of aquaculture in hotspot subregions has increased 10-fold, from 32,037 tonnes to 316,841 tonnes. This is representative of the even greater global increase in agriculture output (a 42-fold increase over the same period) but is mainly driven by two countries: Ghana; and Nigeria. Falling aquaculture output in countries such as the USA and Japan, coupled with globally dwindling fish stocks, is likely to be increased demand for aquaculture products, and potentially stimulate the expansion of aquaculture in West Africa and the hotspot subregions (FAO 2014). Government support for aquaculture is also strong in Ghana (Kassam 2014). While this expansion of aquaculture has the potential for positive environmental impacts through easing of pressure on wild stocks, aquaculture systems themselves can have serious environmental impacts, such as eutrophication of water (Ewoukem *et al.* 2012), destruction of mangroves and pollution of waters (Martinez-Porchas and Martinez-Cordova 2012). This is an area with the potential for instigation of good environmental practice before further establishment of the industry.

Energy and Power Production
Access to electricity in the hotspot countries has increased since 1990, when records began (Figure 5.4). Five of the hotspot countries (Ghana, Côte d'Ivoire, São Tomé and Príncipe, Cameroon and Nigeria) have a higher percentage of the population with access to electricity than for the aggregate population of developing countries in Sub-Saharan Africa. Households without access to electricity are likely to rely on local fuel sources, such as wood and charcoal (CIFOR 2013).

Alternative and nuclear energy still contribute low percentages to the energy produced in the hotspot countries, although no data exists for Guinea, Equatorial Guinea, Liberia, Sierra Leone, and São Tomé and Príncipe. Two of the hotspot countries, Ghana and Cameroon, produce a higher percentage of electricity from alternatives and nuclear than for the total developing countries in Sub-Saharan Africa, with 6.2 percent and 5.6 percent respectively, compared to 2.7 percent for Sub-Saharan Africa.

Figure 5.4 Percentage of National Population with Access to Electricity in Hotspot Countries since 1990



Source: World Bank (2015a).

Hydropower dams are a particular feature across the hotspot with impacts on freshwater ecosystems and dependent rural populations. The Akosombo Dam on the Volta River, built in 1965 to supply electricity for the aluminium industry, created Ghana's most important freshwater fishery (Lake Volta) but water volumes have declined due to a long period of drought in the 1980s and subsequent climate variation, with potential consequences for both the fishery and power generation. The Nangbéto Hydroelectric dam on the Mono River in Togo, was built in the 1980s, creating a reservoir with a surface area of 180 km^2. The scheme generates electricity for domestic and commercial use and the reservoir supports commercial fishing, tourism and irrigated agriculture. The construction of the dam, reservoir and transmission lines resulted in the loss of nearly 150 km^2 of savannah and gallery forest and the reservoir submerged 1,285 households and 5,500 hectares of agricultural land. The loss of natural vegetation and creation of an artificial lake appears to have affected the local climate and led to an increase in snail species, which are intermediate hosts for the bilharzia parasite (UNEP 2008). There are a large number of proposed dams in West Africa but only one proposed inside the hotspot: Mambila Hydropower

Dam in Nigeria (International Rivers 2010). However, it should be noted that, despite being conceived as a project in 1982, little progress has been made on construction to date.

Industry, Manufacturing and Transport

Most of hotspot countries' economies are based on exporting raw commodities, such as gold (Ghana, Benin), crude petroleum (Nigeria, Cameroon, Equatorial Guinea), ore (Guinea, Liberia, Sierra Leone) and cacao beans (Côte d'Ivoire, São Tomé and Príncipe). The exception to this pattern is Togo, where the leading exports are refined petroleum and cement (Observatory of Economic Complexity 2015). Value added through manufacturing made up between 3.6 percent (Liberia) and 14.5 percent (Cameroon) of GDP in hotspot countries in 2011 (World Bank 2015a), which is low compared to more industrialised manufacturing nations, such as Japan. The greater reliance on raw-commodity exports makes hotspot country economies potentially vulnerable to global price movements (KPMG 2014).

Infrastructure and transport development in West Africa is poor, and a barrier to intra-regional trade (see Section 5.3.1). However, recent surveys of investors in the region indicate that there is an expected 25 percent increase in spending on infrastructure (PwC 2014). Hotspot countries had between 1,730 (Benin) and 51,904 (Nigeria) registered air transport carrier departures worldwide in 2013, equating to 15.8 percent of the total departures in developing Sub-Saharan African countries (World Bank 2015a). The liner shipping connectivity index is a measure of connectedness of a country to global shipping networks. Hotspot countries have increased their scores on the index since 2004, apart from Guinea and Sierra Leone, which have fallen slightly in their scores (World Bank 2015a). Hotspot countries' scores currently range from 5.6 to 21.8, which is substantially lower than more industrialised countries, such as China, which has a score of 165, or South Africa, with a score of 37.9. There are no corresponding data on rail and road transportation.

Mining and Oil

Mining (both large-scale and artisanal) for various minerals and fossil fuels is a huge industry in the hotspot (Table 5.10). These industries bring economic benefits to the countries concerned but at major social and environmental costs. Oil, discovered offshore in the Gulf of Guinea in the 1980s and 1990s, has also had enormous economic and social impacts.

In Sierra Leone, mining officially accounted for more than 90 percent of the country's export earnings and 20 percent of GDP before the war in 1991. Despite the historical importance of diamonds as the key export commodity, iron and titanium ore have become the key exports for Sierra Leone, making up 69 percent of total exports (Observatory of Economic Complexity 2015). Leading producers in the country include Sierra Rutile and African Minerals.

In Ghana, most mining is carried out by international corporations but small-scale, illegal mining is 'pervasive'. On the advice of the IMF and World Bank, both logging and mining laws and regulations were relaxed in the 1980s and 1990s, and investment by mining and forestry industries was encouraged through incentives. The mining industry was privatised and liberalised and some mines were even permitted in forest reserves. This brought gold production to new highs (replacing cacao as Ghana's most valuable commodity). Gold mining in Wassa Amenfi West District, which includes Mamiri Forest Reserve KBA (GHA17), received hundreds of millions of dollars in foreign investment. Currently, more than 60 percent of land in the district is under concession to mining companies: the greatest single concentration of mining anywhere in Africa (UNEP 2008). Nevertheless, gold exports have been falling in recent years, mainly driven by a fall in international gold prices resulting in a scale-back in production (Herrera and Aykut 2014). Leading gold mining companies operating in Ghana include Gold Fields Limited, AngloGold Ashanti Ltd. (both South African companies) and Golden Star Resources Ltd. (a Canadian company).

Table 5.10 Value of Mining and Oil Products to the Hotspot Countries

Country	Coal		Minerals		Gas		Oil	
	% GDP	Value in million USD	% GDP	Value in million USD	% GDP	Value in million USD	% GDP	Value in million USD
Benin	0	-	0.01	0.7	0	-	0	-
Côte d'Ivoire	0	-	1.40	434.5	0.83	257.6	3.66	1,137.8
Cameroon	0	-	0.18	53.8	0	-	5.53	1,634.7
Ghana	0	-	5.74	2,761.5	0	-	6.26	3,011.1
Guinea	0	-	10.00	614.5	0	-	0	-
Equatorial Guinea	0	-	0.04	6.7	0	-	53.25	8,297.0
Liberia	0	-	0.67	13.1	0	-	0	-
Nigeria	0.0003	158.58	0.01	48.8	0.91	4,724.2	13.43	70,083.1
Sierra Leone	0	-	0.33	13.7	0	-	0	-
São Tomé and Príncipe	0	-	0	-	0	-	0	-
Togo	0	-	1.99	86.3	0	-	0	-

Source: (World Bank 2015a).

Nigeria was the 13th largest oil producer in the world in 2013 (EIA Beta 2015). More than 75 percent of government revenue is derived from the petroleum industry, and, as such, the economy is vulnerable to falls in crude oil prices. However, the country has established fiscal buffers in the form of savings generated when oil revenues exceed those budgeted (EIA Beta 2015). Oil operations started in the 1960s and national production reached a peak of around 2.6 million barrels per day in 2005, although production has subsequently declined significantly due to the activities of militant groups (EIA Beta 2015). A large number of international oil producers have a presence in the country, including Shell, Total, Addax Petroleum (a subsidiary of the Sinopec Group), ExxonMobil and Chevron. Production takes place principally in the Niger River delta (which includes West Niger Delta KBA (fw13)), where there are persistent environmental and social problems deriving from thousands of oil spills every year. Local communities receive little or no benefit from the oil wells on their land and no compensation for pollution and loss of land and ecosystem services. Corruption and vandalism are rife, with many deaths every year caused by local people trying to steal oil directly from pipelines and setting up thousands of small refineries operated illicitly under cover of darkness throughout the delta.

5.4 Land-use Change (Deforestation, Land Degradation), Forest Resource Use, Communities and Livelihoods

5.4.1 Historic Rates of Land-use Change in West Africa

Patterns of forest cover change can be complex to assess, due to difficulties with assessing, for example, the condition of the forest being lost and gained or changes in forest composition (UNEP 2008). Canopy cover is a commonly used metric, measurement of which has been made easier in recent years by the use of frequently updated satellite imagery analysis. In Togo, forest loss has been reported at the site level (Adjonou *et al.* 2010); and in Côte d'Ivoire the forest edge has been found to be both stable (Goetze *et al.* 2006) and expanding (Gautier 1990, Menaut *et al.* 1990). In Cameroon, despite widespread use of fire, the forest edge is also expanding (Mitchard *et al.* 2009). This trend is very common at the forest edge in Central Africa (Vincens *et al.* 1999, Favier *et al.* 2004, Palla *et al.* 2011). In Guinea, villages in the forest-savanna mosaic create the forest surrounding them, thus creating forest islands (Fairhead and Leach 1996), an observation which has been documented in many other countries with this vegetation type. Other variations of forest loss related to fire are reported for Ghana, where the forest edge comprises fire-sensitive dry forest; forest loss was exacerbated by drought in the 1970s and 1980s, making fire control a priority (Swaine 1992). However, the situation remains complex since some areas exhibit forest expansion. São Tomé presents a singular history of land-use change. Peak deforestation was reached at the beginning of the 20^{th} century, associated with the expansion of coffee and cacao plantations. With the decline of those plantations, there was a massive forest expansion. These new forests were nevertheless very distinct from the native ecosystems, both structurally and in terms of species composition. More recently, the island again experienced an increase in deforestation rates, associated with large agricultural concessions and small-scale horticulture to supply the local market. This deforestation trend is likely to continue, due to steady population growth.

Causes of deforestation in West Africa are multiple and driven by economics, institutions, policies and other influences: shifting agriculture and population growth are not the main causes (Geist and Lambin 2002). In Africa, human numbers have varied over the past millennium, in response to migration, slavery, colonial labour, war and the rise and fall of major states (Vansina 1990). The general trend was for a slow increase in the human population during the period prior to the slave trade and colonisation, subsequent to which population growth declined. Since then populations have begun to grow again, with rapid growth since the 1970s. Wherever people were located, their land use had the potential to impact on forests but also to enhance them by the creation of village forests, and by soil enrichment around settlement sites, in Sierra Leone, Guinea, Liberia and Ghana (J. Fraser pers. comm.).

5.4.2 Livelihoods in West Africa and Their Relationship to Forest

Evidence from a global IUCN project entitled Livelihoods and Landscapes Strategy shows that income from forests in hotspot landscapes is higher than the overall global average, averaging between 30 and 39 percent of household income (IUCN 2012). This high percentage is, in part, a result of the difficulty of raising cattle in the hotspot. In drier countries further north it is evident that income from cattle can substitute for at least 10 percent of forest income.

Rural people who live further from markets and roads are more reliant on environmental resources than people who live nearer to them. Those people who live more remotely are less likely to have paid employment, market crops much less often, and live on the food they grow and the products they gather from forests. In general, women rely on forest income more than men, and poorer people more than wealthier people.

In hotspot countries, forest resources are vital for energy, medicine, and income generation, as well as for protein, vitamins and minerals from wild foods to complement usually carbohydrate-heavy foods from household farms. These forest products translate to income for households, and can be a relatively substantial amount. For example, in Ghana, income from forest resources is typically worth USD 100-200 a year to local households. However, agricultural lands and non-forest environment can provide similar or greater value and products than forests, creating an incentive for forest clearance (Pouliot *et al.* 2012). This is posited to be likely where poorer households have socially restricted access to forest areas, and where there are equivalent NTFPs available outside of the forest.

Bushmeat

Bushmeat is probably the most valuable NTFP in the hotspot. As with fuelwood, bushmeat off-take to supply local rural needs has a relatively low impact on biodiversity, whether consumption or sale is involved. For instance, in specific forest areas of Cameroon (and Congo), the main day-to-day sources of bushmeat come from traps set in farmers' own fields and fallows, as much to protect crops as to catch animals (Endamana 2013a,b). However, bushmeat trade to large urban areas is a different matter, with professional hunters supplying a huge demand. Some are self-financing and some are effectively on contract to members of urban elites, who supply the ammunition as required. As a high value-to-weight product, easily preserved through smoking, bushmeat is one of very few tradable commodities to generate cash in remote areas.

In 2008, the bushmeat trade in West and Central Africa was estimated to be worth as much as USD 200 million annually (Reuters 2008). Within the hotspot itself, one survey in Cameroon estimated that 70 to 90 tonnes of bushmeat per month were being sold in Yaoundé's four main markets (Nasi *et al.* 2008). Bushmeat is also transported from the mainland to the 'luxury bushmeat market' in Malabo on Bioko (including species such as giant pangolin not found on the island), because of the high prices which can be obtained (Bioko Biodiversity Protection Program 2015). This in turn is due to the relative wealth created by oil exploitation and higher disposable incomes among immigrant and local oil workers (Hearn *et al.* 2006). There is also an illicit trade in bushmeat out of the region to the West African diaspora overseas. In São Tomé and Príncipe, bushmeat might offer some interesting trade-offs to conservation. Although some of the endemic and native species are threatened by hunting, such as pigeons and the Critically Endangered dwarf olive ibis, hunters might also be controlling populations of introduced mammals, such as pigs and monkeys, that contribute to forest degradation (Carvalho *et al.* in press; 2015). Threats to biodiversity created by the bushmeat trade and potential conservation solutions are discussed in Chapter 8.

6. POLICY CONTEXT OF THE HOTSPOT

The countries within the hotspot contain remarkable biodiversity and high rates of endemism within their forests (see Chapters 3 and 4). The countries are also generally poor and face many social challenges for their development and their ability to undertake conservation actions (see Chapter 5). Pressures on the species, sites and corridors of global conservation importance are also high, and often increasing (see Chapter 8). Political and economic instability in the region has also reduced the ability of countries to respond to challenges, and disease outbreaks such as Ebola in 2014, have also had their impacts in parts of the region. Countries across the region have, nonetheless, become increasingly aware of environmental issues over the past 20 years, and all 11 hotspot countries have introduced relevant policies and laws to tackle environmental challenges and conserve biodiversity. These responses take various forms.

This chapter presents the context of global, regional and national policies, agreements and institutions in the hotspot, and provides an evaluation of the responses they have elicited and the results they have brought. Where possible, the findings of the chapter are linked back to the conservation outcomes defined in Chapter 4.

6.1 Governance

6.1.1 National Governance and Corruption

The popular perception is that many West African countries suffer from high rates of corruption and poor governance. The 2014 Corruption Perception Index assigns all hotspot countries a scores between 48 (61^{st} rank) and 25 (145^{th} rank), with the maximum score of 100 indicating good governance (Transparency International 2014). These results suggest that, in all hotspot countries with the possible exception of Ghana, corruption is a factor in citizen's daily lives, and hence impacts all work across the region. Additional details on the governance structure of each of the countries in the hotspot are given in Appendix 7.

6.1.2 Conflicts and Security Issues

West Africa has experienced considerable political instability, authoritarian regimes, civil unrest and armed conflicts in the past 20 years. Security and economic conditions have improved in the past five years but the root causes that led to these conflicts persist today in some countries, due to high levels of unemployment, inequality and poverty, ethnic or sectarian tensions, and power struggles over land and the extraction of natural resources.

In some countries, the aftermath of war has reduced the ability of the state to enforce the rule of law and to place the environmental agenda alongside other immediate development concerns. In the case of Sierra Leone, the devastating civil war (1991–2002), which began as an overspill from an earlier war in Liberia, led to a series of direct and indirect impacts on conservation efforts in the country. For instance, rebel groups destroyed or damaged park facilities as well as urban, water and agricultural infrastructure in rural areas and towns in the east of the country (UNEP 2010). Cross-border poaching increased between Sierra Leone, Liberia and Guinea, and there was a mass movement of refugees to Guinea, causing significant deforestation. Destruction of public records led to land grabbing and lack of clarity regarding property rights. Institutions in charge of environmental management collapsed, and low levels of transparency and accountability led to illegal logging concessions inside protected areas (Brown and Crawford 2006). Although there has been a marked progress in security conditions, environmental and natural resource governance remained at a critical stage for a number of years (UNEP 2010), although improving in recent years.

The armed conflict that took place across Liberia from the 1990s to the early 2000s also resulted in significant loss of life, large population displacements and the dismantlement of institutions and infrastructure facilities. Although environmental conditions declined in general as a consequence of the overall state of lawlessness, the illegal exploitation of natural resources financing the struggle was particularly damaging, as well as the destruction of the already precarious sewage treatment and waste management systems (Tigani and Brandolini 2006). Since the signing of the Accra Peace Accord in 2003, which marked the end of the Second Liberian Civil War, the country has stabilized and shown signs of moderate economic recovery, security conditions in rural areas have improved, government institutions and key infrastructure is being rebuilt, and there have been moderate socio-economic advances.

Nigeria's transition from military to civilian rule occurred in 1999 and the country is now a democracy, although all three elections held since then have been highly contested (Agbu 2004). Security concerns remain due to a struggle over political control, economic resources and landownership, coupled with ethnic and religious differences (International Crisis Group 2012). High unemployment figures, corruption and poor governance are also contributory factors that exacerbate these problems (Nwanegbo and Odigbo, 2013). These challenges make it hard for environmental policies to be implemented effectively and corruption around logging is widespread, for example.

Benin and Ghana have been fairly stable for the past 20 years. Both countries present encouraging governance indexes compared to other countries in the region, according to the Worldwide Governance Indicators (World Bank 2014b), which measures voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. Ghana, in particular, has made good progress towards accomplishing the MDGs but environmental sustainability is among the areas to have shown slow progress (African Development Bank 2013). Even in Ghana, 'chainsaw' logging in forest areas outside (and also within) reserves is commonplace.

Since the beginning of the new millennium, Côte d'Ivoire has seen two civil wars: the first lasting from 2002 to 2007; and the second from 2010 to 2011. These resulted in substantial security issues, including civilian casualties, and have left the political situation in the country highly polarized and unstable. Guinean politics are also highly unstable, and concerns over the transparency of the election process have recently resulted in incidents of political violence and inter-ethnic clashes. Forest change statistics for Côte d'Ivoire show that there was significant forest loss between 2000 and 2010, including within reserves, presumably due to the impacts of the civil war and loss of government control.

During the past three decades, Cameroon and Equatorial Guinea have experienced a fairly stable political context but without any alternations of power. Both countries have been ruled by longstanding presidents and strong majority parties. The political situation in São Tomé and Príncipe is also fairly stable. A recent intended coup and parliamentary shake-up notwithstanding, crime, terrorism and civil unrest are uncommon in the relatively peaceful island nation.

6.2 Global Environmental Agreements

The governments of all the countries within the hotspot are signatories to a range of global agreements (Table 6.1). These international agreements influence national policy and the development of national laws. These in turn support partnerships between government and CSOs for the process of safeguarding the countries' natural resources and achieving the conservation of species, sites and corridors.

Table 6.1 Overview of Participation in Multilateral Agreements Related to Environmental Protection and Conservation by the Hotspot Countries

Multilateral Agreement	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea	Ghana	Guinea	Liberia	Nigeria	São Tomé & Príncipe	Sierra Leone	Togo
CBD (Biodiversity)	x	x	x	x	x	x	x	x	x	x	x
UNFCCC (Climate)	x	x	x	x	x	x	x	x	x	x	x
Ramsar (wetlands)	x	x	x	x	x	x	x	x	x	x	x
CITES (Wildlife Trade)	x	x	x	x	x	x	x	x	x	x	x
UNCCD (Desertification)	x	x	x	x	x	x	x	x	x	x	x
CPWCNH (World Heritage)	x	x	x	x	x	x	x	x	x	x	x
UNDRIP (Human Rights)	x	x			x	x	x			x	

Source: Authors and consultation workshops.

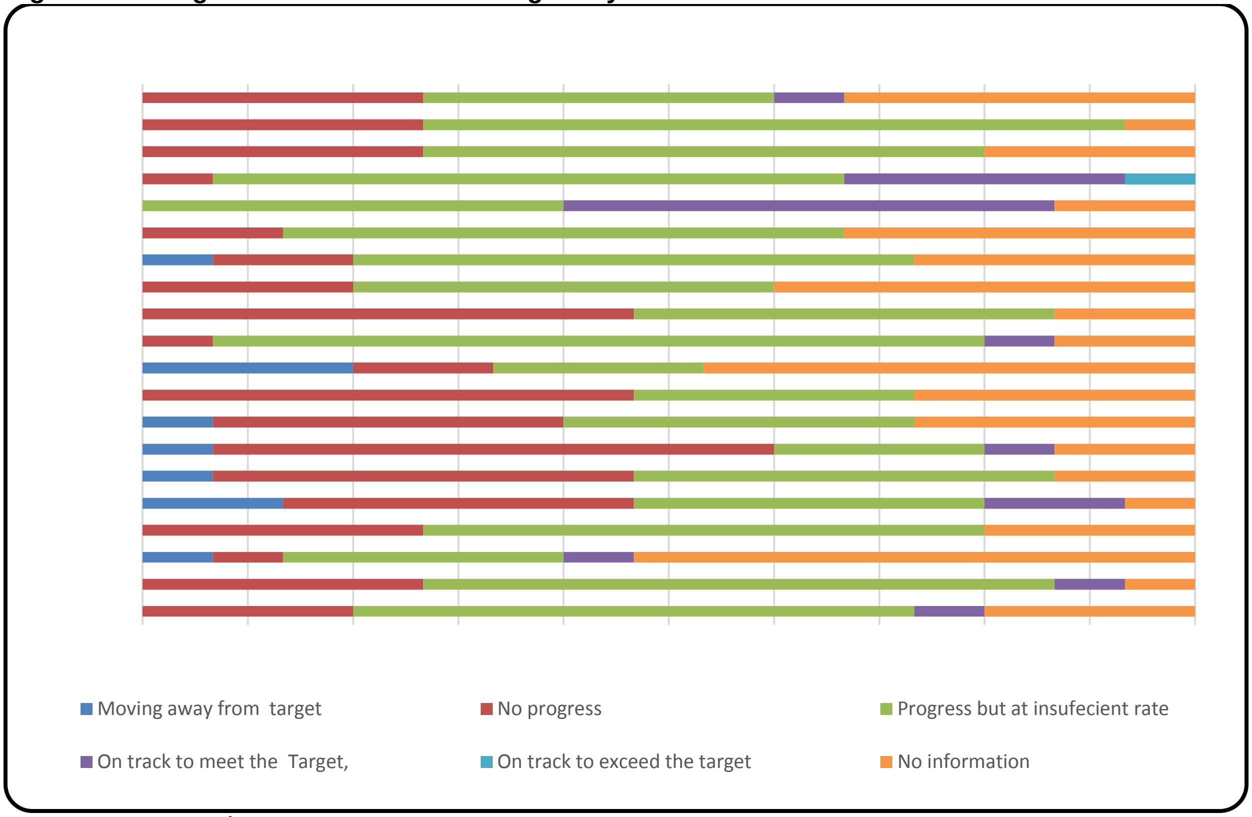
6.2.1 Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is a multilateral treaty, effective since 1993, which currently has 168 signatories. Within the hotspot, Benin, Cameroon, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria and São Tomé and Príncipe have all ratified the convention; Equatorial Guinea and Sierra Leone have acceded to the document, while Togo has accepted it.

Nine of the hotspot countries produced National Biodiversity Strategies and Action Plans (NBSAPs) to guide national implementation of the CBD in the period 2002–2007 (for details see Appendix 8). After the 10th Conference of the Parties to the CBD in Nagoya in 2010, all countries were encouraged to revise their NBSAPs and present new and updated versions. So far, only Cameroon has presented a new version and Guinea has produced a draft. It may be that other hotspots countries are also working towards the revision of their NBSAPs but this is not recorded on the CBD database (Secretariat of the Convention on Biological Diversity 2015).

To evaluate progress towards the targets of the Strategic Plan for Biodiversity 2011-2020 (i.e. the Aichi Targets), a review of all 5th progress reports to the CBD was undertaken. This shows that national self-reporting of progress against the 20 CBD Aichi Targets by 15 West African countries suggests poor progress in the region, and that much will be required to achieve these targets by 2020 (Figure 6.1). For the majority of the Aichi Targets, progress was reported as either "no information", "progress but at an insufficient rate" or "no progress". For some, there was even movement away from the target.

Figure 6.1: Progress toward the Aichi Targets by 15 West African Countries



Source: Review of 5th Progress Reports submitted to the Convention of Biological Diversity.

Assisting countries to improve progress towards the Aichi Targets could be an important target for CEPF investment in the hotspot, especially in relation to those targets that are relevant to forest conservation, such as targets 5, 11 and 12.

6.2.2 United Nations Framework Convention on Climate Change and Kyoto Protocol

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty signed in 1992, and the sole current international policy venue on climate change with widespread recognition, owing to its virtually universal membership. All 11 countries in the hotspot are Non-Annex I members: Guinea ratified the treaty in 1993; Benin, Cameroon, Côte d'Ivoire and Nigeria in 1994; Ghana, Sierra Leone and Togo in 1995; São Tomé and Príncipe in 1999; Equatorial Guinea in 2000; and Liberia in 2002.

The Kyoto Protocol, unlike the UNFCCC, includes legally binding commitments for developed nations. Equatorial Guinea and Guinea ratified the treaty in 2000; Benin, Cameroon and Liberia in 2002; Ghana in 2003; Nigeria and Togo in 2004; Sierra Leone in 2006; Côte d'Ivoire in 2007; and São Tomé and Príncipe in 2008. A commitment period from 2008 to 2012 was established, while an extension known as the Doha Amendment has been proposed to take effect for the period between 2012 and 2020. The 11 countries of the hotspot are Non-Annex I parties, and therefore have no binding commitments under the Kyoto Protocol to reduce GHG emissions.

Under the UNFCCC, another global mechanism for mitigating climate change is REDD+, which refers to reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries. Within the hotspot there are active national REDD+ processes underway in many of the hotspot countries, with UN-REDD supporting Nigeria and Côte d'Ivoire, and other funding mechanisms supporting other countries. In addition, there are also well-advanced plans for voluntary carbon offset projects in the Gola forests of Sierra Leone and the Takamanda Mone Landscape of southwestern Cameroon.

6.2.3 Ramsar Convention

The Convention on Wetlands of International Importance especially as Waterfowl Habitat, commonly known as the Ramsar Convension, is an international treaty with 168 parties at present. All countries in West Africa are parties to the convention, and have nominated 64 wetland sites, with a total area of 115,486 km^2 as Wetlands of International Importance (or 'Ramsar sites'). Sixteen of these Ramsar sites are located within the hotspot and cover a total reported area of 7,509 km^2: Barombi Mbo Crater Lake (4 km^2) and Estuaire du Rio Del Rey (1,650 km^2) in Cameroon; Azagny National Park (194 km^2) in Côte d'Ivoire; Isla de Annobón (230 km^2) in Equatorial Guinea; Owabi Reservoir (73 km^2) in Ghana; Konkouré (900 km^2) in Guinea; Gbedin Wetlands (< 1 km^2), Kpatawee Wetlands (8 km^2), Lake Piso (761 km^2), Marshall Wetlands (122 km^2) and Mesurado Wetlands (68 km^2) in Liberia; Apoi Creek Forests (292 km^2), Oguta Lake (6 km^2) and Upper Orashi Forests (252 km^2) in Nigeria; Ilots Tinhosas in São Tomé and Príncipe (< 1 km^2); and Sierra Leone River Estuary (2,950 km^2) (Table 6.2).

Table 6.2 Years in which Hotspot Countries Joined the Ramsar Convention, Number of Ramsar Sites per Country and Number within the Hotspot

Country	Year joined	Ramsar Sites in Country	Ramsar Sites in Hotspot
Benin	2000	4	0
Cameroon	2006	7	2
Côte d'Ivoire	1996	6	1
Equatorial Guinea	2003	3	1
Ghana	1988	6	1
Guinea	1993	16	1
Liberia	2003	5	5
Nigeria	2001	11	3
São Tomé and Príncipe	2006	1	1
Sierra Leone	2000	1	1
Togo	1995	4	0

Source: Authors' review of Ramsar Convention data.

6.2.4 Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) aims to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild, and confers varying degrees of protection on more than 35,000 species of fauna and flora. The hotspot countries are all parties to the convention: Nigeria ratified the convention in 1974, Ghana in 1975 and Togo in 1978, while Cameroon, Guinea and Liberia acceded in 1981, Benin in 1984, Equatorial Guinea in 1992, Côte d'Ivoire and Sierra Leone in 1994, and São Tomé and Príncipe in 2001.

CITES is an important convention for the countries of the Guinean Forests Hotspot, as it seeks to regulate trade in wildlife. In the hotspot, international unregulated trade in wildlife and wildlife products has posed a threat to plant and animal biodiversity in the past (for example grey parrot (*Psittacus erithacus*) export to the EU) and continues to do so for some species, for example for bushmeat export to the West African diaspora. The previously significant trade in wild birds to Europe from West African countries was greatly reduced by an EU trade ban. Better understanding the effectiveness of CITES and the scale of legal and illegal trade is an important conservation need in the hotspot and something that CSOs are well placed to address.

The National Legislation Project of CITES has looked at which countries need to strengthen their legal frameworks for the effective implementation of CITES, including to combat illegal trade in wildlife (CITES 2014). Out of 17 countries identified to require priority attention, one is a hotspot country: Liberia. Of the 11 hotspot countries, only Nigeria is considered to fall into category 1, meaning that its national legislation is believed generally to meet the requirements for implementation of CITES. However, Nigeria is currently subject to a CITES suspension on all commercial trade in wildlife, because of failure to provide a National Ivory Action Plan. Guinea is also subject to a CITES suspension on all commercial trade, because of compliance and enforcement issues.

The following hotspot countries are subject to CITES trade suspensions for particular species:

i. Benin (*Pandinus imperator* – because trade levels not considered sustainable)
ii. Cote d'Ivoire (*Pericopsis elata* – because trade levels not considered sustainable)
iii. Ghana (*Pandinus imperator* – because trade levels not considered sustainable)
iv. Togo (*Poicephalus robustus, Pandinus imperator* – because trade levels not considered sustainable)

West African countries are currently subject to 110 species/country specific EU trade suspensions (under the EU Wildlife Trade Regulations, which implement CITES in the EU) for wild-sourced specimens, i.e. the trade in 109 species and one 'commodity' (coral rock) is banned in at least one of these countries (Species+ 2015).

6.2.5 Other Conventions

The Convention concerning the Protection of the World's Cultural and Natural Heritage (CPWCNH or World Heritage Convention), effective since 1975, has been ratified by all 11 countries of the hotspot. Out of three World Heritage Sites nominated because of their natural values by the hotspot countries, only one is situated within the hotspot: Taï National Park in Côte d'Ivoire, with a reported area of 3,300 km^{2}. This site is included within Parc National de Taï et Réserve de Faune du N'Zo KBA (CIV11). Other KBAs might also qualify for natural World Heritage Site status, were they to be assessed against the criteria and nominated.

The United Nations Convention to Combat Desertification (UNCCD) is a convention adopted in 1994 to combat desertification and mitigate the effects of drought. Although all 11 hotspot countries are members of the convention, it is not relevant to the parts of these countries within the hotspot, as they are not affected by desertification.

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) was adopted by the General Assembly of the United Nations in 2007, following approval by 143 member countries. While not a multilateral environmental agreement, it comprises an important part of the global legal framework establishing Indigenous Peoples' rights with respect to land and natural resource ownership, management and access. It is thus directly relevant to conservation issues in the hotspot that relate to conflicts around resource rights. In the hotspot, Benin, Cameroon, Ghana, Guinea, Liberia and Sierra Leone voted in favor of the declaration, Nigeria abstained and Côte d'Ivoire, Equatorial Guinea, São Tomé and Príncipe and Togo were absent. The declaration outlines the rights of Indigenous Peoples globally and outlaws discrimination against them. In particular, it enshrines the principle of free, prior and informed consent with indigenous communities with regard to development decisions that affect their lives. This declaration is important for conservation practices that involve local communities, such as community-based forest management, which is emerging as an important conservation process in a few countries in the hotspot.

6.3 National Legislation

The following section provides a non-exhaustive description of some of the main constitutional and legal frameworks and policies that relate to the management of natural resources and to biodiversity conservation in hotspot countries. The main laws in each country are presented in a detailed table below (Table 6.3), and summarized later (Table 6.4). In some of the hotspot countries, legislation related to conservation is very old. For instance, the environmental laws in Ghana date back to the colonial era (pre-1957) and mostly deal with disease prevention and control and wildlife protection. Moreover, environmental legislation in Sierra Leone is at least two decades old. Many of the hotspot countries have been or are modernizing their laws and including new considerations, such as provisions for community-based conservation.

Since the ceasefire in 2003, Liberia has enacted a great deal of environmental reform. Recent environmentally relevant laws and policies include the following: the 2009 Community Rights Law; the 2011 Community Rights Regulation; the 2009 Liberia Extractive Industries Transparency Initiative Act; the 2010 Maritime Authority Act; and others (Table 6.3).

Table 6.3 Main Environmental Laws, Policies and Institutions in the Hotspot Countries

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Benin	Law n° 98-030	- Country's main environmental law. - Creates the main institutions in charge of implementing the environmental policies and provides provisions on soil, subsoil, continental and marine waters, flora and fauna; pollution, hazardous and non-hazardous waste; Environmental Impact Assessments (EIA), environmental audits and applicable sanctions. - Creates the Environmental Agency of Benin and the National Commission of Sustainable Development	Ministry of the Environment and Protection of Nature (Created 2006 – Decree nº 2006-460)	Supporting the implementatio environmental national and m
	Law nº 93-009	- Governs the forest sector. - Regulates both public and private forests and allows for community management arrangements. This regime distinguishes between classified and protected State forests - Calls for management plans developed with participation of local communities and defines access to wood and non-wood products for commercial or medicinal purposes. - Regulates licenses for commercial exploitation of these areas and provides some tax exemptions to promote reforestation	Beninese Agency for the Environment (ABE)	
	Law n° 2002-016	- Legal regime on wildlife	The National Center for the Management of Wildlife Reserves (CENAGREF)	Responsible fo protected area
	Decree 2011-394	- Includes wildlife conservation and management measures	The Ministry of Mines, Energy and Water	As stated
	Law nº 2006-17	- Mining Code	Ministry of Agriculture, Livestock and Fisheries are also relevant in this context	As stated
	Law n° 2002-16	- Allows local participation in the management of protected areas		

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Cameroon	Law nº 96/12	- Main legislative act governing environmental management - Contains basic principles for environmental legislation formulation: Precautionary; Polluter pays; Prevention and corrective action; Also contains specific mandates on air, water, soil and subsoil, pollution and chemical and toxic waste; Creates National Fund for Environmental and Sustainable Development; Promotes development of national environmental management plans and regulates EIAs	Ministry of Forests and Fauna	Principal autho wildlife and pro issues
	Law nº 94/01	- Protects and manages forests - Contains provisions on protected areas, wildlife protection and hunting rights		
	Ten-year (2005–2015) Forest and Environment Sector Program	- Facilitates sustainable forest management - Five priorities: five priorities: 1) Environmental management, including environmental monitoring and awareness; 2) Forest production; 3) Wildlife and protected areas (focused on the development of a network of protected areas properly financed and managed with local participation; 4) Community forest management, with three subcomponents: community forest management, community forest regeneration and fuel wood supply in the northern regions; and 5) Institutional strengthening, training and research	Ministry for the Environment and the Protection of Nature	Responsible fo and monitoring environmental

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Côte d'Ivoire	Environmental Code (Law 96-766)	- Main environmental legislation, regulated by a series of ministerial decrees on land-use, management, and organization of forests	Ministry of Environment and Sustainable Development	Head national policies
	Water Code (Law 98-755)		National Agency for the Environment (ANDE)	
	Mining Code (Law 96-553) (regulated by the Decree 634-1996)	- As stated	National Commission of Sustainable Development	Defines nation and action pla
	Oil and Gas Code (Law 96-669)	- As stated	Ministry of Water and Forests (Created by Decree 2002-359)	Responsible fo management o plants and hab and reserves
	Law 96-478	- Governs fisheries		
	Law 225-1965 (amended by Law 442-1994)	- Governs faunal protection and hunting	National Agency for the Development of Forests	
	Decree (96-894)	- Governs applicable procedures for EIAs	National Office for National Parks and Nature Reserves	
	Law 102-2002	- Finances and manages natural parks and reserves		
Equatorial Guinea	Law 7-2004	- First and main environmental law in the country, governs areas such as air, water and soil quality, pollution and conservation	Ministry of Environment	Responsible fo national enviro policies, and c managing prot such as natura reserves, natu protected land scientific reser
	Law 4-2000	- Governs protected areas		
	Decree 172-2005	- Governs trade of threatened life		
	Act 1-1997 (Amended by Law 7 of 2003)	- Governs forest use and management, covers classification and definition of forest products; conservation of ecosystems; economic and taxation regime; monitoring and penalties, as well as the two main forest areas: production and conservation		
	Law nº 2/1987	- Fisheries Law, regulated by Decree nº 123/1987 - Decree nº 86/1981 – Regulates artisanal fishing		
	Mining Law nº 9/2006	- As stated		

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Ghana	1971 Wildlife Reserves Regulations and 1961 Wildlife Animals Preservation Act	-Main environmental laws	Ministry of Lands and Natural Resources	In charge of m administration
			Environmental Protection Agency	In charge of c monitoring anc of environmen prescribes sta guidelines rela land pollution, discharges an toxic substanc others
	Environment Protection Authority (EPA) Act 490-1994	- Governs EIAs	Forestry Commission	In charge of pr development, and regulation wildlife resour
	1997 Timber Resource Management Act (Amended by Acts 617 and 624 of 2002) and 1999 Forestry Commission Act	- Governs forestry regulations	Ministry of Environment, Science and Technology	As stated
	Forestry Development Master Plan (1996–2020)	- Guides the implementation of Forest and Wildlife Policy	Environmental and Natural Resources Advisory Council	Advises parlia
Guinea	Law 045-1987 and Law 022-1989	- Deal with environmental protection	National Directorate of Waters and Forests	Legally respon managing all f Guinea
	Law 038-1999	- Main forest code		
	Law 038-1999	- Main law on wildlife protection and hunting	Ministry of the Environment, Water and Forestry	In charge of pr environmental policies
	1995 Mining Code	- As stated		
	1995 Code for Sea Fishing	- As stated	National Centre for the Management of Protected Areas (CENAGAP)	As stated
	Arrêté nº 676/MPA/SGG/2006 and Décret D/97/017/PRG/SGG	- Govern artisanal fishing and provide sanctions and penalties for fisheries		

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Liberia	2003 Environment Protection and Management Law	- Meant to enhance and manage Liberia's environment and natural resources; Contains the usual environmental principles; provisions on EIAs; environmental quality standards; pollution control and licensing; protection of biodiversity and environmental restoration	Environmental Protection Agency	Implements na environmental
	1988 Wildlife and National Parks Act	- Ensures conservation and development of wildlife by controlling hunting and preserving habitats in protected areas		
	2006 National Forestry Reform Law and 2007 Forestry Regulations	- Governs the conservation and management of all commercial, conservation and community forests		
	2003 Environmental Protection Agency Act	- As stated	National Environment Policy Council	Provides polic coordinate pol regulations
	2006 Mineral and Mining Act (nº 703) and 2010 Mineral Policy	- As stated		
	2010 Fisheries Regulation	- As stated		
	2007 Integrated Water Resource Policy	- As stated	Forestry Development Authority	Responsible fo forests and pa reserves and c areas
	2009 National Environment Policy and Regulation on the Commercial and Sustainable Extraction of NTFPs	- As stated		
Nigeria	Environmental Impact Assessment Act and 2009 Regulation on Environmental Permits and Licenses (S. I. nº 29)	- As stated	Federal Ministry of Environment	Ensures envir protection and resources con sustainable de
	1999 Act 46	- Current legal instrument under which national parks and their head offices are managed		
	1956 Forest Law and 1956 Forestry Regulations and 2006 National Forest Policy	- Main acts in the forestry management sector - Provides for wildlife conservation and management through the creation of national parks, game reserves, and tourist facilities, etc.		
	National Drought and Desertification Policy	- As stated		
	Environmental Enforcement Policy	- As stated		

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Nigeria (continued)	National Environmental Sanitation Policy, National Policy Guidelines on Solid Waste Management and National Policy Guidelines on Market and Sewage Management and 2009 Regulation on Sanitation and Waste Control (S. I. nº 28)	- As stated	National Council on Environment	Highest enviro formulating org country
	1992 Inland Fisheries Act and 1992 Sea Fisheries Act	- As stated		
	2007 National Minerals and Metals Policy and 2007 Nigerian Minerals and Mining Act	- As stated	National Council on Environment	Highest enviro formulating org country
	1963 Wild Animals Law	- As stated		
	1985 Endangered Species (Control of International Trade and Traffic) Act	- As stated		
	1978 Land Use Decree nº 6	- As stated		
	2009 Regulation on Wetlands (S. I. nº 26)	- As stated	Nigeria National Park Service	Responsible fo National
	2009 Regulation on Access to Genetic Resources and Benefit Sharing (S. I. nº 30)	- As stated		
	2011 Regulation on Protection of Endangered Species in International Trade (S. I. nº 16)	- As stated		
	1979 Decree nº 46	- Establishes of a network of National Parks		
	1991 Decree nº 36	- Creates the National Parks Governing Board		
	1999 Act 46	- Current legal instrument under which park units and their head offices are managed		
São Tomé and Príncipe	Law nº 10/99	- Outlines basic principles relating to environmental policy in the country	Ministry for the Environment	As stated
	Law nº 11/99	- Provides a framework for the conservation of fauna, flora and protected areas	Forestry Department	As stated
	Decree nº 37/99	- Regulates the process for EIAs, ensuring habitat protection	ECOFAC	Conservation Utilization of F Ecosystems ir
	Forestry Law nº 5/01	- As stated	São Tomé and Príncipe Union for Progress (SteP Up)	Focuses on ec training in agri environment, I income-genera
	Laws nº 6/06 and nº 7/06	- Create the Obô Natural Parks of São Tomé and Príncipe, respectively		

Country	Main Environmental Laws and Policies	Key Features	Main Environmental Institutions	Key I
Sierra Leone	1972 Wildlife Conservation Act	- Governs the protected areas system; under review	Environmental Protection Agency	Implements ar compliance of policies, and e approves EIAs
	1988 Forestry Act	- As stated; under review	Ministry of Lands, Country Planning and the Environment	Govern enviro forestry issues
	1960 Provinces Land Act (Cap 122)	- Governs land issues	Ministry of Agriculture	
	2007 Fisheries Act nº 10	- As stated	Forestry and Food Security (MAFFS)	
	2011 Petroleum Exploration and Production Act nº 11	- As stated	Ministry of Fisheries and Marine Resources	
	2009 Mines and Mineral Act	- Governs the mining operations in the country; contains prohibition in Section 32 (1) (a) to develop mining operation in land set apart for public purposes (e.g. roads, highways)	Conservation and Wildlife Management Unit of the Forestry Division (part of MAFFS)	Responsible fo conservation a areas
Togo	Environmental Law 2008-005	- Establishes main framework for environmental management, protected areas, conservation of biological diversity, sustainable development and environmental impact assessments	Ministry of the Environment and Natural Resources	In charge of in state policy on matters and fo resources
	2008 Forestry Code	- Main legislation in forestry area	National Environmental Committee (CNE)	As stated; Cre Environmenta restructured b 008/MERF
	2001 National Action Plan for the Environment	- As stated	Commission for Sustainable Development	As stated; Cre 2008-005
	Strategy for Conservation and Sustainable Use of Biological Diversity	- As stated		
	1998 Fisheries Management Policy	- As stated	National Agency for the Management of the Environment	Responsible fo to the impleme environmental
	Fisheries Law nº 98-012	- As stated		
	Mining Code nº 96-004	- As stated		

Source: Authors review of national legislation.

Table 6.4 Overview of National Policies, Laws and Regulations Relating to Environmental Protection and Biodiversity Conservation

Topic Addressed by Policies, Laws and Regulations	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea	Ghana	Guinea	Liberia	Nigeria	São Tomé & Príncipe	Sierra Leone	Togo
Protected areas	x	x	x	x	x	x	x	x	x	x	x
Species conservation[1]									x		
Forestry management	x	x	x	x	x	x	x	x	x	x	x
Land use planning			x		x			x		x	
Poverty Strategy Reduction Paper (PSRP)	x	x	x	x	x	x	x	x	x	x	x
Sustainable financing[2]		x			x		x	x			
Environmental Impact Assessment (EIA)	x	x	x	x	x	x	x	x	x	x	x
Community conservation		x			x						
Transboundary conservation		x	x			x	x	x	n/a	x	
Decentralization	x	x	x	x	x	x		x	x	x	x

Source: Authors' review of national legislation.
Notes: 1 = Seemingly only under the auspices of CITES and NBSAPs; 2 = Development of a Trust Fund in Liberia and REDD+ in Cameroon, Nigeria and Ghana.

Over the last two decades Côte d'Ivoire has issued a series of laws concerning forests, protected areas, land-use planning and wildlife protection, as well as a constitutional provision promoting the right to a healthy environment. The Forest Code of 1965 has been under review since 2002. Moreover, a forest policy and strategic plan was approved for the 2010–2015 period, which contemplates the creation of a forest development fund, new reforestation efforts and prescriptions for the management of rural forests (Blaser *et al.* 2011). In 2014, a new national forest code was introduced, which defines forest protection and reforestation areas, including the various categories of rights applicable in forestry, the establishment of protected forests and reserves, and matters concerning customary rights and the issuance of logging concessions.

In Ghana, to date, no comprehensive legislation has been enacted setting environmental standards and general environmental principles. Wildlife conservation and environmental concerns are not prioritized compared with competing agendas in the health, agriculture or education sectors, which has an impact in terms of funds allocations for environmental protection (IUCN/PACO 2010). Recent years of political and social unrest have also reduced the effectiveness of environmental protection in Togo (USAID 2008).

In Benin, Article 27 of the constitution determines that every person has the right to enjoy a healthy environment. Benin updated its forestry policy in 2011 and introduced a series of environmental measures to improve energy efficiency and to extend waste management services (African Economic Outlook 2013).

In order to improve its environmental performance, Nigeria developed a number of policies for biodiversity, forests, and other biological resources at all levels of government (USAID 2008). Although Nigeria does not have a comprehensive environmental act, the government has been active in enacting relevant legislation, such as the Environmental Impact Assessment Act, as well as a series of regulations on various topics. A new forest law, which would provide legal backing to the National Forest Policy of 2006, is currently under discussion.

Although most of the environmental legislation in São Tomé and Príncipe is not legally binding, mechanisms and laws exist that are used to protect species and habitats. Arguably the greatest problem surrounding environmental legislation in the country is enforcement. Although the existing legislation has shortcomings, it is still likely to be enough to overcome many of the problems, if it was implemented (R. Lima pers. comm.).

6.3.1 Environmental Laws and Regulations

Across the hotspot, the legislation in place to support conservation activities is variable. Most countries have laws in place around protected areas, forestry, environmental impact assessments, and poverty reduction. Some countries also have laws and regulations governing land-use planning and community conservation, transboundary conservation, sustainable financing species conservation, and decentralization of decision-making. Targeted CSO advocacy programs might be used to help countries develop relevant laws and regulations, where these are not already in place.

6.3.2 Protection of Sites

Protected areas constitute an essential tool, not only to protect biodiversity, but also the ecosystem services they provide to the communities (IUCN 2008). However, biodiversity conservation through protected areas in West Africa presents a particularly challenging task, given the high levels of poverty and often low institutional capacity of the countries (Homewood 2004). West Africa includes some of the least developed and most populated countries in the world (UNDP Human Development Index 2013). Protected area management institutions face limitations in capacity and motivation, often severe. Moreover, three quarter of the poorest people in the region are found in rural areas, where they depend on agriculture and related activities for their livelihoods (GEF 2010).

The constitutions of all hotspot countries provide legislation relevant to the creation and management of a framework of protected areas, and all hotspot countries have made significant progress towards creating a national PA network (see Table 6.5). About 108,104 km^2, or 17.4 percent, of the remaining closed forest in the hotspot is within protected areas of various types (including national parks, wildlife sanctuaries and a few private and community-managed reserves). However, when the area under more strict levels of protection for biodiversity conservation purposes (IUCN protected area Categories I to IV) is calculated, the protected area coverage falls to 18,800 km^2 (three percent of the forest area). Much of the remainder of the protected area network in the hotspot is made up of a network of forest reserves, some of which are also managed for timber production.

Challenges remain within the hotspot to develop a comprehensive protected area network, and include the prevailing customary land ownership, resource tenure, limited capacity and conflicts over alterative land uses, such as logging and mining. These mean that the creation of any new protected area is a long, complicated and costly process, especially if people are living in the area.

Table 6.5 Summary Information on Protected Areas in the Hotspot Countries

Country	No. of PAs	% Cover of PAs	Realm		Status			Level of Protected Area			
								International			National
			Terrest-rial	Marine (all or part)	Desig-nated	Propos-ed	Not reported	WHS	Ramsar	MAB	
Benin	58	23.5	58	0	55	1	2	0	4	2	52
Cameroon	106	15.8	104	2	55	16	35	1	7	3	95
Côte d'Ivoire	252	30.3	241	11	252	0	0	2	6	2	242
Equatorial Guinea	16	32.7	7	9	16	0	0	0	3	0	13
Ghana	321	15.2	316	5	310	11	0	0	6	2	313
Guinea	124	4.9	117	7	122	2	0	0	16	4	104
Liberia	21	13.3	16	5	7	14	0	0	5	0	16
Nigeria	1,000	15.8	994	6	984	16	0	0	11	1	988
São Tomé & Príncipe	4	30.1	4	0	2	2	0	0	1	0	3
Sierra Leone	50	6.1	42	8	43	7	0	0	1	0	49
Togo	95	12.2	95	0	95	0	0	0	4	1	90

Source: World Database on Protected Areas, downloaded September 2013.
Notes: WHS signifies UNESCO World Heritage Sites; Ramsar signifies Wetlands of International Importance (i.e., Ramsar sites); and MAB signifies UNESCO Man and Biosphere Reserves. Percentage cover figures calculated using only protected areas for which polygons were available; protected areas mapped as points were not included.

6.3.3 Protection of Species

Laws protecting specific species do not exist within the countries of the hotspot, apart from those species listed on CITES Appendices or in NBSAPs. However, several species conservation action plans have been produced at the national or regional levels, which are often endorsed by the national governments. Conservation action plans exist for for both subspecies of chimpanzee present in the hotspot, as well as western gorilla, which include the creation of sanctuaries, efficient biomonitoring, increased education and awareness, and review of legislation and enforcement (Kormos and Boesch 2003, Tutin *et al*. 2005, Morgan *et al.* 2011, IUCN 2014). In addition, these action plans identify certain critical regions in Cameroon, Côte d'Ivoire, Equatorial Guinea, Ghana, Guinea, Liberia, Nigeria, Sierra Leone and other non-hotspot countries. In São Tomé and Príncipe, action plans with specific conservation objectives have been created for the Critically Endangered bird species of São Tomé and Príncipe thrush (BirdLife International 2014a,b). Targeted action plans for key species in the hotspot are a way to focus attention and funding on the needs of specific species but require significant funding to implement them.

6.3.4 Forestry Management

This hotspot is mainly composed of lowland to montane forests and hence the policies and laws relating to forest utilization in the region are important for conservation of all forest areas, including protected areas, as well as KBAs and corridor areas with no legal protection.

There is a general tendency for the forest resources of the region to be degraded through overexploitation, often illegally (see Chapters 5 and 8). For example, the forestry industry of Ghana has declined from a major export earner to a more minor part of the Ghanaian economy in less than 20 years (Domson and Vlosky 2007). The same is true in Sierra Leone, Nigeria and Côte d'Ivoire. This means that less attention is given to forestry in policy making within many of the hotspot countries than in the past. Only Cameroon has an important forestry sector remaining that generates a significant amount of national income. Work to improve forest management, enhance forest certification and reduce illegality in the forest sector is important across the hotspot. Yet, as long as timber has high value and there remains a significant lack of transparency in the forestry sector, achieving lasting change through CSO engagement will be challenging.

6.3.5 Land-use Planning

Land-use planning at the national and subnational scales is important for the protection of KBAs and corridors. Across the different countries, land use planning legislation is in place in four of the hotspot countries only (see Table 6.4). This is an important lacuna because the allocation of land to different uses, ranging from smallholder farming to industrial plantations to protected areas is a politicized issue and a major conservation challenge in hotspot countries.

6.3.6 Poverty Reduction Strategy Papers

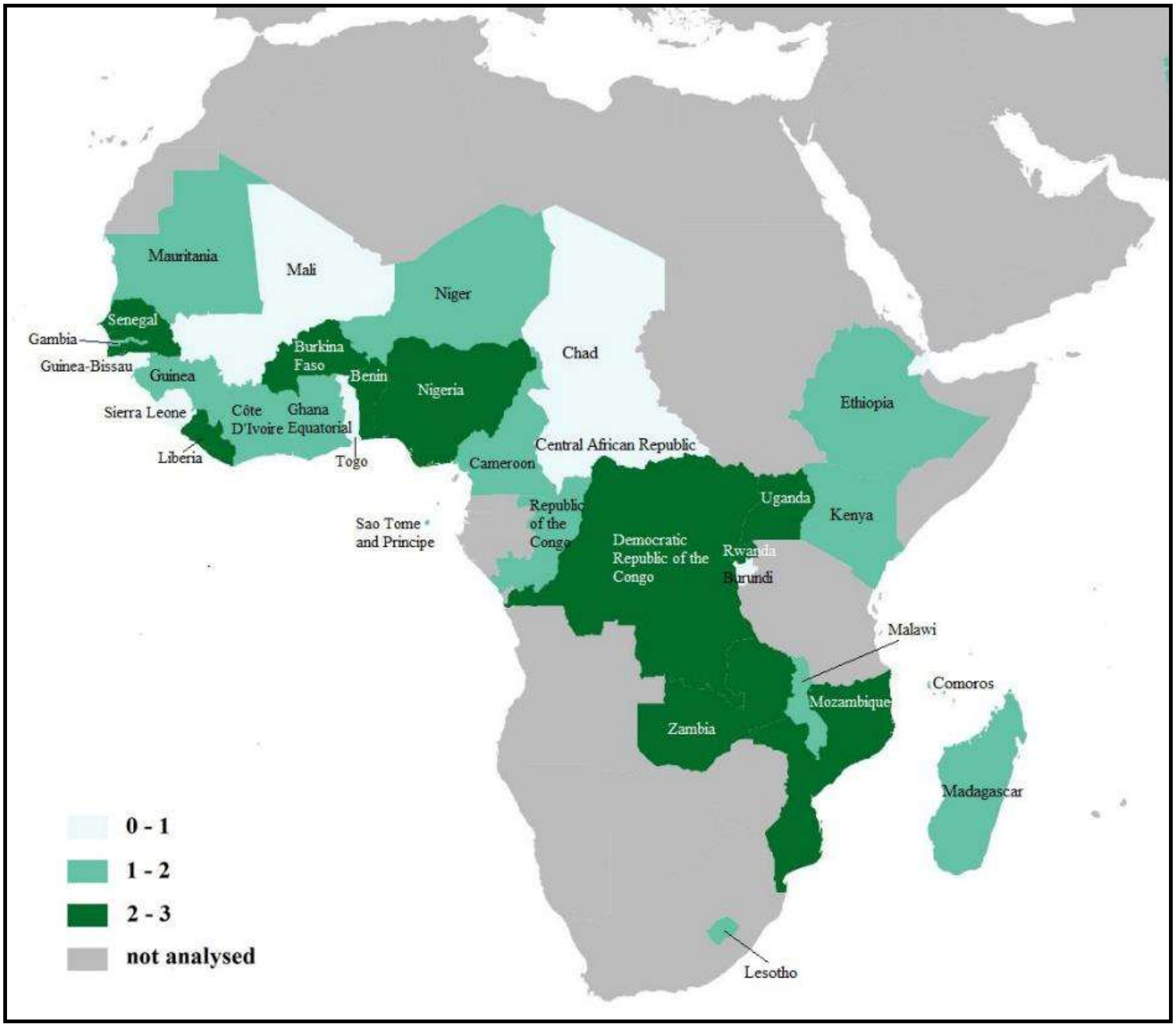
Poverty Strategy Reduction Papers were prepared by World Bank member countries, as a guide for donor investment in support of the MDGs. A review in 2010 showed that biodiversity considerations were variably reflected in these papers (Figure 6.2).

Following the adoption of the Sustainable Development Goals (SDGs) in September 2015, there is now a need to revise national priorities for development. This creates opportunities to mainstream biodiversity into national development objectives. CSOs have potentially important contributions to make to this process, in support of national implementation of the SDGs, especially SDG15 to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss".

6.3.7 Sustainable Financing

As protected areas have generally not been a high budgetary priority for governments in the hotspot, one of the responses has been to try and develop alternative sustainable financing streams. In at least two places, attempts are being made to develop funding streams from REDD+ forest carbon payments using the voluntary carbon market: Gola Forest in Sierra Leone (including KBA SLE1) and in Korup National Park (CMR5) in Cameroon. Nigeria is also developing its national REDD+ strategy, which may result in additional funding sources for forest conservation. In other countries, attempts are being made to develop funding streams from tourism. For example, Kakum National Park in Ghana (part of KBA GHA15) has an aerial walkway, which, as of 2010, attracted 140,000 visitors per annum, roughly 80 percent of whom were local Ghanaians. Taï National Park in Côte d'Ivoire (part of KBA CIV11) also attracts tourists for viewing of groups of habituated chimpanzees. Natural resource income tends to be centralized and in the hands of the wildlife or (especially) forest administrations, which means that sustainable financing mechanisms that operate locally are difficult to establish.

Figure 6.2 Integration of Biodiversity into the Poverty Reduction Strategy Papers of Selected African Countries



Source: Roe (2010). Note: 0 means that biodiversity is not reflected and 3 means that it is strongly reflected.

There are few other sustainable financing mechanisms for conservation in the hotspot, such as green taxation schemes, conservation trust funds, tourism tax schemes, or PES schemes based on water or carbon. While a number of initiatives are seeking to bring these kinds of mechanisms into existence, few are yet to become truly active. For example, the Global Conservation Fund is seeking to establish a sustainable financing mechanism for the East Nimba Nature Reserve in Liberia and there are REDD+ pilot schemes under the voluntary carbon scheme in Sierra Leone and Cameroon. Promoting sustainable financing mechanisms could be an important area for investment through CSOs in the hotspot. One example of an active conservation trust fund is the Fondation pour les Parcs et Réserves de Côte d'Ivoire, which aims to manage environmental funds, finance projects and programs relating to the conservation of national parks and reserves of Côte d'Ivoire, and to strengthen management capacity within Côte d'Ivoire's conservation sector.

6.3.8 Environmental Impact Assessment

All of the hotspot countries have Environmental Impact Assessment (EIA) requirements in place. This is a relatively new development, partly in response to more rapid development in the mining and oil and gas sectors, and the emerging pressures for development of plantations of palm oil and rubber. Individual EIAs were not assessed during the ecosystem profiling process but the limited experience of applying the tool in the hotspot suggests that the average quality of the EIAs undertaken in the Guinean Forests is likely to be lower than the international norm.

Regarding the extractive industries, initiatives like the Extractive Industries Transparency Initiative (EITI, which is a global initiative primarily focused on setting standards for ensuring full disclosure of taxes and other payments made by oil, gas and mining companies to governments) are improving the levels of accountability and transparency in this sector, although environmental safeguards in some countries are still behind international standards. Countries in the region complying with the EITI Standards are: Cameroon, Nigeria, Togo, Côte d'Ivoire, Ghana and Liberia. Sierra Leone's compliance status has been temporarily suspended until remedial actions are taken and São Tomé and Príncipe, Equatorıal Guinea and Guinea are yet to meet all the requirements. Much could be done to improve the quality of EIA and SEA in the hotspot and there is a clear role for CSOs in this area of work.

6.3.9 Community Conservation

Another emerging trend in the legislation is the need to include local communities in conservation actions, including protecting and managing their own conservation areas. Across the hotspot as a whole, regulations governing community-based conservation are not particularly well developed, with relevant legislation existing only in Cameroon and Ghana and being developed in Sierra Leone. In Ghana and Cameroon, examples of community-managed reserves can be found where communities are using a combination of customary and statutory laws to regulate forest resource use. In other countries, it remains difficult for communities to own and manage their natural resources according to statutory laws, although they still do so according to their customary rules. Promoting community-based forest management in the countries where there is a legal basis for it and promoting policy reform in countries where there is not was identified by stakeholders consulted during the profiling process as an important conservation strategy for CSOs.

6.3.10 Transboundary and Corridor Conservation

Most of the conservation corridors that are identified in this hotspot are regions of high shared biological diversity within a single forest ecoregion. At the present time in most parts of the hotspot the degree of connectivity between forest patches is declining and there ability to support viable populations of wide-ranging species and deliver ecosystem services is being diminished. Chapter 4 identifies nine conservation corridors, where enhancing connectivity at the landscape scale would strengthen conservation efforts at KBAs and ensure long-term persistence of biodiversity. Five of these countries span two or more countries. However, there currently exists no national legislation related to transboundary cooperation for conservation.

6.3.11 Decentralization

The process of decentralization involves the transfer of power from central to local governments, with various degrees of administrative, financial and political implications. Encouraged by international organizations, a significant amount of reform towards decentralizing institutional structures has taken place in the region over more than two decades.

Some of the decentralization processes in the region have received criticism due to problems of transparency in the management of public resources, insufficient transfer of funds and fiscal power to local authorities, exceeding concentration of political and financial power as well as human resources at higher levels of government, and a lack of accountability in the public sector (Okojie 2009). In Cameroon, for instance, transferring the management of forest resources to village or local management committees has allegedly led to the overexploitation of timber in the absence of proper monitoring controls designed to prevent elite capture and corruption (Oyono 2004, 2005).

Processes of decentralization typically take place within the context of strong customary land management systems. Very often, the *de jure* national to local government legal system operates alongside the *de facto* customary management of land and resources at the village level. This tension between ‘modern’ and ‘traditional’ ownership and management is found in all countries and is important for all conservation projects in the hotspot.

Countries like Benin, Cameroon, Côte d’Ivoire and Ghana have also transferred power to local authorities with respect to land-use planning and environmental management. For example, Legislative Acts 97-028 and 99-029 in Benin empower the regions and municipalities to develop land-use plans that deal with environmental affairs, among other issues. Others, such as Liberia, are behind in this regard, despite having made progress in developing national decentralization policies.

Benin has undergone a decentralization process since 1998, effective with local elections in 2002 and 2008. While Beninese departments are managed by a central government representative, communes are governed by locally elected leaders (Caldeira *et al.* 2010).

In Sierra Leone, following the Local Government Act of 2004, the governance system now features a central and a local government structure, as well as elected and chiefdom councils (The REDD Desk 2015). Local authorities have the decision-making authority to establish their own land-use plans and extract natural resources. However, the national government still plays a central role in licensing mineral and forestry rights. Large levels of informality in these sectors and weak institutional capacities remain a challenge in these processes as well as a lack of transparency and some form of elite capture by certain chiefs and their families (UNEP 2010). Nonetheless, the relatively decentralized nature of governance in Sierra Leone reportedly allows traditional authorities, local councils and district forestry officers to play an important role in managing protected areas (Brown and Crawford 2006).

The legal framework in Cameroon shows that the 2004 decentralization laws have local development and governance as their main focus and represent a step forward for the process. Nonetheless, effective legal instruments are needed for their application and the acceleration of the process to provide good local governance (Cheka 2007).

In Côte d'Ivoire, upon independence, decentralization was not of major concern for the authorities, despite relevant legal documentation. The new constitution of 2000, however, provided for establishment of local authorities, members of which are elected by the local population.

Equatorial Guinea contains decentralization and coordination principles in its main environmental legislation (Law nº 7/2003). Yet, so far, they have not been operationalized. This legislation also has specific procedures on land use plans for natural resources that are meant to be followed by local authorities but they also have not been implemented, which is causing conflicts among sectors with regard to competing land uses (Observatoire des Forêts d'Afrique Centrale 2012).

Ghana has implemented reforms aimed at political, administrative and fiscal decentralization and local government since 1988, leading to significant advances and 170 locally governed authorities. Nevertheless, several issues still remain, including a slow integration rate of decentralized departments with national governance, ineffectiveness of local substructures, lack of popular participation in local governance and low capacity of local assembly members (Government of Ghana 2010).

While decentralization in Guinea (a historically highly centralized country) has not been achieved to a great extent, the process, envisioned for the first time in 1985, is being reluctantly pursued. Important steps in the process have included local elections and the adoption of the Local Government Code (World Bank 2008).

In Nigeria, a very populous country with a federal system, decentralization has become increasingly important in the last two decades. Thus, the constitution provides for the division of responsibilities between the central, state and local governments. The latter are in charge of several matters including: economic planning and development, health services, land use, social welfare, sewage and refuse disposal, adult and vocational education, and development of agriculture and natural resources (Okojie 2009).

In São Tomé and Príncipe, governing district councils (known as 'câmaras distritais') in each of the seven municipal districts are elected every five years and maintain limited autonomous powers. In addition, the autonomous status of the island of Príncipe guarantees an element of decentralization in the country; Príncipe has its own local government and parliament (Democratic Republic of São Tomé and Príncipe 2004).

The ongoing decentralization process in Togo began in 1991, with the creation of the Ministry of Decentralization and relevant constitutional reforms in 1992. Under the close supervision of the ministry, the decentralized entities at the middle and local levels were jointly assigned decision-making powers, as well as implementation, consultation and control functions, while financing remained under the exclusive control of the central government. These entities, however, failed to obtain necessary resources for these responsibilities, and thus the decentralization process has since lost pace, resulting in the limited autonomy of local governance in the country (FAO n.d.).

6.3.12 Enforcement of Laws and Regulations

Despite the development of policy and laws over the past 20 years in the hotspot countries, the enforcement capacity of implementing agencies is limited by financial and human constraints in most countries. Inadequate implementation and enforcement mechanisms remain a big challenge, as well as overlaps and a lack of coordination between the different governmental bodies and sectors. Scarce resources, inadequate personnel, particularly at local levels, continue to hinder the appropriate implementation of the legal and policy measures adopted so far.

6.4 Regional Agreements

The region is covered by a number of regional bodies and agreements that have an important bearing on conservation in the hotspot. Two regional bodies foster economic and conservation cooperation: the Economic Community of West African States (ECOWAS) and the Economic Community of Central African States (ECCAS). The eight hotspot countries in West Africa are members of ECOWAS, while Cameroon, Equatorial Guinea and São Tomé and Príncipe belong to ECCAS. ECOWAS has formulated a forest convergence plan, which recognizes the role of CSOs, while a similar plan has been developed for Central Africa by the Central African Forest Commission (COMIFAC). Both the ECOWAS and COMIFAC convergence plans define regional priorities for the conservation and sustainable management of forest resources. There are also a number of regional or pan-African programs that are working in the hotspot.

6.4.1 Economic Community of West African States

ECOWAS was founded in 1975 as a regional pillar of the African Economic Community, responsible for contributing to the continent’s development. Its mission is to promote collective self-sufficiency, economic integration, stability and cooperation within the region, including in areas such as natural resources, energy and agriculture, through the creation of a single large West African economic and trading union. The ECOWAS Treaty aims to harmonize and coordinate national policies on environmental protection, through the promotion of programs, projects and activities in the fields of agriculture and natural resources. The ECOWAS Commission has produced an Environmental Policy, in line with the Vision 2025 of the ECOWAS Heads of State, which envisions a “peaceful, dignified and prosperous region whose various and productive natural resources are preserved and managed on sustainable basis for the development and equilibrium of the subregion” (ECOWAS 2008).

6.4.2 Commission of Central African Forests

COMIFAC is an intergovernmental organization focused on the sustainable management of Central African forests. It has 10 member states, including Cameroon, Equatorial Guinea and São Tomé and Príncipe within the hotspot. In 2005, COMIFAC adopted a convergence plan to improve the preservation and management of Central African forests.

6.4.3 New Partnership for Africa's Development

The New Partnership for Africa's Development (NEPAD) is an economic development program of the African Union, of which all hotspot countries are member states. Adopted in 2001, it aims to provide an overarching vision and policy framework for accelerating economic cooperation and integration among African countries. The program's primary objectives include the eradication of poverty, the empowerment of women, and the promotion of sustainable growth and development. In order to complement other African processes and improve environmental conditions by assisting African countries to implement regional and international environmental agreements, NEPAD has launched an Environment Initiative, with an Environment Action Plan (NEPAD 2003).

6.4.4 Sustainable and Thriving Environments for West African Regional Development

The Sustainable and Thriving Environments for West African Regional Development Program (STEWARD) is a forest conservation and sustainable livelihoods program. STEWARD's work is focused on two priority ecosystems in West Africa. The first comprises Outamba-Kilimi National Park and neighboring subprefectures in northwestern Sierra Leone, outside the boundaries of the hotspot. The second comprises Mount Nimba and East Nimba Nature Reserve, in Côte d'Ivoire, Guinea and Liberia, and broadly corresponds to the Mount Nimba Complex (Corridor 3). STEWARD's strategic objective is to implement a coherent regional program that addresses transboundary threats to biodiversity, capitalizes on regional opportunities to spread best practices, harmonizes policies, and addresses the adverse effects of global climate change.

6.4.5 Central African Regional Program for the Environment

The Central African Regional Program for the Environment (CARPE) is an initiative to promote sustainable management of natural resources in the Congo Basin. It aims to reduce forest degradation and loss of biodiversity rates by increasing local, national, and regional natural resource management capacities. In order to achieve this goal, CARPE works on the implementation of sustainable forest and biodiversity management practices, the strengthening of environmental governance, as well as forest and other natural resource monitoring. CARPE is currently active in several countries, including Cameroon, Equatorial Guinea and São Tomé and Príncipe, the governments of which have express their willingness to create a meaningful transboundary forest protection framework (CARPE 2012).

6.4.6 Congo Basin Forest Partnership

The Congo Basin Forest Partnership (CBFP) is a non-profit initiative promoting conservation and responsible management of the tropical forests in the Congo Basin through improvement of techniques and information sharing by involved organizations. Launched in 2002, CBFP is led by the United States and sponsored by more than 40 international governments and investors. CBFP works closely with COMIFAC, and has 10 member countries, including Cameroon, Equatorial Guinea and São Tomé and Príncipe in the hotspot. In 2011, a meeting was held under the partnership, aimed at the creation of an action plan to strengthen national wildlife law enforcement.

7. CIVIL SOCIETY CONTEXT IN THE GUINEAN FORESTS HOTSPOT

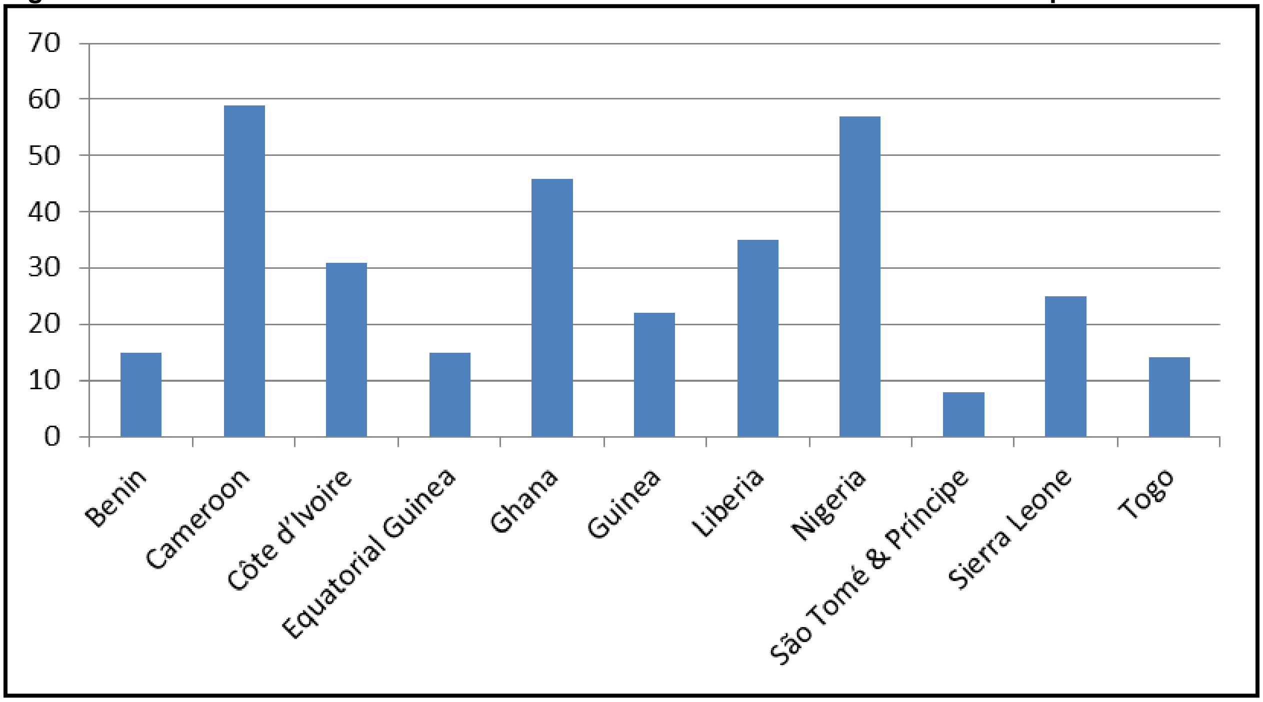
This chapter provides an overview of the CSOs that are engaged in natural resource management and biodiversity conservation in the Guinean Forest Hotspot. CEPF broadly defines civil society as the set of institutions, organizations and individuals located between the family, the state and the market, in which people associate voluntarily to advance common interests. This chapter is based on desk studies and reviews, information obtained from representatives of civil society groups during the stakeholder consultation workshops described in Chapter 2, personal knowledge of the authors, and responses from a number of CSOs through remote consultations.

7.1 General Overview

As is the case in almost all parts of Africa, CSOs in the Guinean Forests Hotspot are broadly those institutions and organizations operating at the interface between the government and private sector, and those who tackle issues at the level of families and individuals (e.g. land ownership matters). These include NGOs, private voluntary organizations, community based organizations (CBOs), trade unions, gender groups, cultural and religious groups, private companies, and research institutions. Civil society groups display differences in their relative degrees of formality, autonomy and power relationship with other stakeholder groups. A breakdown of the different categories of civil society groups is provided in Section 7.2.

Although the organizations consulted during this profiling process varied in terms of their composition, vision and core values, most shared an ideology of promoting the conservation and sustainable management of West Africa's biodiversity. During the consultation process, key CSOs were identified in each of the hotspot countries. A number of the CSOs consulted showed significant potential for the implementation of conservation strategies in the hotspot. Figure 7.1 shows the number of CSOs involved in the conservation or sustainable management of biodiversity within the hotspot, including national and international NGOs; community-based organizations; universities and research centers. Cameroon has the largest number with 59, followed closely by Nigeria with 57 and Ghana with 46. The country with the fewest CSOs involved in conservation or sustainable management of biodiversity is São Tomé and Príncipe, with eight.

Figure 7.1 Number of CSOs Involved in Conservation Identified in Each of the Hotspot Countries



Source: Consultation workshops and remote consultations between December 2013 and September 2015.

Table 7.1 Selected Local CSOs in the Hotspot Countries

Country	Organizations
Benin	Association Vive le Paysan Nouveau (AVPN); Centre de Recherche pour la Gestion de la Biodiversité et du Terroir (CERGET); Benin Ecotourism Concern; Bees; CREDI-ONG; Femmes Solidaires; Groupe de Recherche et d'Action pour le Bien- être au Benin (GRABE-Benin); Nature Tropicale ONG.
Cameroon	Cameroon Wildlife Conservation Society; Cameroon Biodiversity Conservation Society (CBCS); Food and Environment Development Association; ERUDEF; Cameroon Environmental Watch (CEW); Centre for Environment and Development (CED); Community Action for Development (CAD), Forest and Rural Development Foundation(FORUDEF); Nature Cameroon; Forest Resources and People (FOREP), Youth Development Center, Community Action for Justice and Development (CAJAD), Network for the Environment and Sustainable Development Forest Governance Learning Group (NESDA/GREG), Operation Total Impact, Forest Governance and Industrial Concerns (EGI), People Earthwise, Education for sustainable Development (ASYOUSED), Global Water Partnership Central Africa, Cameroon Ecology (CAMECO), REACHOUT Cameroon.
Côte d'Ivoire	ACB - Côte d'Ivoire; Les Familles et Environnement Restaures (LESFERES); NGO Société et Vie; ONG Le Monde Rural; Source De Vie; SOS - Forets.
Equatorial Guinea	ONG Amigos de la Naturaleza y Desarrolle ge Guinea Ecuatorial (ANDEGE); Asociación de Apoyo à la Mujer Africana ((ASAMA); Asociación para la Promoción de la Mujer (ASPROMU); Red de Mujeres Africanas; para el Desarr Ollo Sostenible (REFADD); COMAPROGE.
Ghana	A Rocha Ghana; Conservation Alliance; Ghana Wildlife Society; Civic Response; Green Earth Organization (GEO); Together Rural Development Solidarity (TORUDES); Tropenbos International Ghana (TBI-Ghana); Development Institute (DI); Friends of the Earth Ghana (FOE); Friends of the Nation.
Guinea	Guinea Ecologie; COLUFIFA Guinea.

Country	Organizations
Liberia	Green Advocates; Sustainable Development Institute (SDI); Society for the Conservation of Nature; Farmers Associated to Conserve Nature; Rural Integrated Centre for Community Empowerment (RICCE); Skills and Agricultural Development Services; PROSPER; University of Liberia; Save My Future Foundation (SAMFU); SEC; Environmental Foundation for Africa (EFA) – Liberia; Forest Cry; Agriculture Relief Services (ARS); Skills and Agricultural Development Services (SADS); Initiative for Peace and Development Incorporated (PAD); Friends of Ecosystems and Environment Services (FEES); Foundation for Environmental Services and Sustainable Agriculture (FESSA); Lifting Farmers (LIFA).
Nigeria	Nigerian Conservation Foundation; Pandrillus; Nigeria Environmental Study Team (NEST); Environmental Right Action (ERA); DIN; Non Governmental Organization Coalition for the Environment (NGOCE); Rainforest Resources and Development Centre (RRDC); Centre for Secured Health and Environmental Development Initiative (SHEDAFRICA).
São Tomé and Príncipe	Mar, Ambiente e Pesca Artesanal (MARAPA); Associação de Biológos Santomenses (ABS); Association Monte Pico (AMP); Association Régional pour la Protection Sociale et Environnemental (ARPA); Association de Défense de l'Environnement et de Développement Rural (ADADER); Clube das Nações para Proteção do Ambiente e Educação (NAPAD); Ligue de la Conservation de la Nature (LCNSTP).
Sierra Leone	Environmental Foundation for Africa (EFA); RAP; Conservation Society of Sierra Leone (CSSL); Environmental Forum for Action (ENFORAC); Green Future; Green Scenery.
Togo	Les Compagnon Ruraux; Les Amis de la Terre; Jeune Volontaires pour l'Environnement (JVE) –Togo; Association « Initiatives pour les Développement Durable et Prospectives » (IDDP); Magnificat Environnement Association; New World (Terre Nouvelle); Association pour la Gestion Integre et Durable de l'Environnement (AGIDE).

Source : Consultation workshops and remote consultations between December 2013 and September 2015.

Among the CSOs identified, the majority are registered in one of the hotspot countries, with a local board or other governance structure, and activities at the grassroots, subnational and/or national levels. Such CSOs are considered to be local organizations, and examples are given in Table 7.1, focusing on organizations working on the conservation and/or sustainable management of biodiversity. A number of these groups have relevant experience working in other countries or in partnership with international organizations, although very few local CSOs with an explicit regional focus were identified during the stakeholder consultation process.

A number of international CSOs are active in the conservation or sustainable management of biodiversity in the hotspot, and examples are given in Table 7.2. Their involvement is often through partnerships with local CSOs (e.g. BirdLife International and its partners), while some international CSOs have established country programs or representative offices in hotspot countries.

Table 7.2 Programs and Presence of Selected International CSOs Active in the Hotspot

Organization and Programs	Presence in Hotspot Countries
African Wildlife Foundation (AWF) has a focus on biodiversity conservation and is soon to be active in southwestern Cameroon.	Cameroon
Bioko Biodiversity Protection Program (BBPP) is based in Luba and conducts research on large apes and on marine turtles on the south of the island of Bioko.	Equatorial Guinea

Organization and Programs	Presence in Hotspot Countries
BirdLife International has its international headquarters in the United Kingdom, but also has an African Regional Office in Nairobi Kenya, which oversees the West African Regional Office based in Accra, Ghana. BirdLife has national partner NGOs in six of the hotspot countries. While it does not have a partner in São Tomé and Príncipe (due to the inexistence of a suitable candidate), BirdLife nevertheless has had a strong presence in the country over the last decade or so, due to its elevated importance for bird conservation. The organization's major interest is on birds and people, and it undertakes programs for the conservation of birds which are jointly implemented with national partners	Cameroon, Côte d'Ivoire, Ghana, Liberia, Nigeria and Sierra Leone
CARE International began operations in Ghana in 1994, but soon expanded operations to Benin and Togo. CARE programs and projects are implemented through partnerships with local CSOs.	Benin, Ghana, and Togo
Center for International Forestry Research (CIFOR) is present mainly in Cameroon. Works in research partnership around Manyemen in the Korupmba-Obachap corridor.	Cameroon
Conservation International (CI) works with regional and national partners in the Mano River Conservation Program comprising of 4 of the hotspot countries – Côte d'Ivoire, Guinea, Liberia and Sierra Leone. CI also has forest conservation programs in Ghana and Liberia. CI works with Conservation Alliance on many of their programs especially in Ghana.	Mano River Program, Equatorial Guinea, Ghana, and Liberia
ECOGUINEA is based in Pico Basile, and provides support to the conservation of biodiversity through sensitization and research extension.	Equatorial Guinea
Environmental Justice Foundation (EJF) is a UK-based non-profit organisation working internationally to protect the environment and defend human rights. EJF aims to use direct and effective information gathered from field projects based on community partnerships to influence national policies.	Côte d'Ivoire, Ghana, Liberia and Sierra Leone
Environmental Foundation in Africa (EFA) aims to protect and restore the environment in West Africa. EFA is involved in environmental education and awareness raising campaigns, restored degraded lands and conserved pristine forests.	Liberia and Sierra Leone.
Forest Peoples Program (FPP) is similar to the RRI in all respects and works in partnership.	Cameroon, Liberia.
International Union for Conservation of Nature (IUCN) is present in the hotspot through the West and Central Africa Regional Program, and has its regional office situated in Ouagadougou, Burkina Faso. IUCN supports networking activities and capacity building for CSOs and governments in the hotspot countries. The organization has a range of programs on forest governance, supports research into the inter-relations between biodiversity and economics or climate change, and develops activities in specific biomes such as freshwater, wetlands and drylands.	Benin, Cameroon, Côte d'Ivoire, Equatorial Guinea, Guinea, Sao Tomé and Príncipe, and Togo
Last Great Apes (LAGA) is a Wildlife Law Enforcement NGO based in Cameroon and working in close cooperation with Governments. It aims at fighting the commercial poaching with its related trade of protected species.	Cameroon
Rights and Resources Initiative (RRI) focuses on community rights, land tenure and small forest enterprises. They work with national advocacy groups and networks, local communities and indigenous organizations.	Cameroon, Liberia
Royal Society for the Protection of Birds (RSPB) is a UK charity working to secure a healthy environment for birds and all wildlife. RSPB programs in the hotspot include: a) the conservation of São Tomé's critical species, b) the conservation of the Gola Rain Forest, c) development of conservation capacity in Nigeria, and d) development of conservation capacity in Sierra Leone.	Cameroon, Ghana, Nigeria, and São Tomé and Príncipe, Sierra Leone

Organization and Programs	Presence in Hotspot Countries
Wild Chimpanzee Foundation (WCF) aims to enhance the survival of the remaining wild chimpanzee populations and their habitat, using an evidence-based approach to conservation. WCF is working mainly in the Cestos-Sapo-Grebo-Taï-Cavally Corridor (Corridor 4) in Côte d'Ivoire and Liberia, and also has local partners on the Fouta Djallon Massif in Guinea.	Côte d'Ivoire, Guinea, Liberia
Wildlife Conservation Society (WCS) has programs with various CSOs and governments in the hotspot forest landscapes of Cross River State, Nigeria, and Korup National Park (CMR5) and the Banyang Mbo Wildlife Sanctuary in the Western part of Cameroon.	Cameroon, Equatorial Guinea, Nigeria
World Wide Fund for Nature (WWF) also collaborates with various national and regional partners in the Congo Basin on a variety of issues including ecosystem services, REDD+ initiatives and landscape programs. The organization has conservation programs in the Mount Cameroon landscape and Korup National Park (CMR5) of Cameroon.	Cameroon, Côte d'Ivoire, Equatorial Guinea, Ghana, Liberia, and São Tomé and Príncipe
World Agroforestry Center (ICRAF) focuses on agroforestry research and achieved development goals through partnerships with local and national NGOs.	Cameroon, Cote d'Ivoire, Nigeria

Source: Consultation workshops and remote consultations between December 2013 and September 2015.

7.2 Categories of CSO

More than 300 CSOs working on conservation-related issues in the hotspot were identified during the profiling process (Figure 7.1). It is important to note that not all of these CSOs are equally active, with some not having implemented activities for several years, as a result of funding gaps, loss of key staff or other constraints. Most of these CSOs can be classified into one of five major categories, which are reviewed in turn in this section.

7.2.1 Technical Organizations

These are organizations that operate their own projects to pioneer new or improved approaches to problems, generally within a specific field. Typically they are international organizations, and have support of international donors and governments. Examples include: CI and FFI in Liberia; Wildlife Conservation Society (WCS) and Pandrillus Foundation in Nigeria; IUCN and World Wide Fund for Nature (WWF) in Cameroon; and Conservation Alliance, IUCN, Rainforest Alliance and Tropenbos International in Ghana. The national NGO partners of BirdLife International play active roles in eight of the 11 hotspot countries: Cameroon; Côte d'Ivoire; Ghana; Guinea; Liberia; Nigeria; Sierra Leone; and São Tomé and Príncipe.

7.2.2 Development Organizations

These are organizations that concentrate on grass-roots democracy, social justice and social development, and whose members attempt to shape a popular development process. Most of these organizations have links with international NGOs (e.g. OXFAM, CARE International, etc.). Most of the funds available for carrying out their activities are sourced from development agencies.

7.2.3 Advocacy Groups and Networks

These are organizations without field projects, and whose primary activity is advocacy. Examples include Civic Response and Ghana Forest Watch in Ghana; Sustainable Development Institute (SDI) and Green Advocates in Liberia, Centre for Environment and Development (CED) in Cameroon, Mar Ambiente E Pesca Artesanal (MARAPA) and Zatona-Adil in São Tomé and Príncipe, and Amigo de la Naturaleza y del Desarrollo de Guinea Ecuatorial (ANDEGE) in Equatorial Guinea.

7.2.4 Awareness Groups

These are organizations whose major activities revolve around improving the awareness of local communities on issues related to conservation and sustainable management. Examples include Ghana Wildlife Society, whose program includes environmental education activities, and Korup Rainforest Conservation Society, whose work is focused on Korup National Park (CMR5) in Cameroon.

7.2.5 Networking Groups

These are organizations that relate to the awareness group above, and complement their advocacy activities at both the national and regional scales. Forest Watch Ghana, national components of the Network of African Women for Sustainable Development (REFADD) in Equatorial Guinea and Cameroon, and the Environmental Foundation for Africa and Green Actors of West Africa in Sierra Leone are specific examples.

7.3 Operating Context and Political Space

A critical factor affecting any given CSO's ability to work in a country is the legal and regulatory framework, which allows and governs its establishment, and space and scope to function in public life. All of the organizations consulted during the profiling process justified their legitimacy by reference to their registration with their respective state institutions. This allows them to operate as advocacy organizations and to engage stakeholders in the management of natural resources, including government institutions.

The role played by civil society in the protection and sustainable management of natural resources in the hotspot countries is generally still limited, although they have significant impacts in some cases. The hotspot countries typically face many political and socioeconomic problems which have ramifications for the conservation and management of natural resources (see Chapters 5 and 6). Examples include the recent wars in Côte d'Ivoire, Liberia and Sierra Leone, and the recent outbreak of the Ebola virus in Guinea, Liberia, Nigeria and Sierra Leone. CSOs working on public policy, advocacy or projects in controversial areas face particular challenges. Notwithstanding this sometimes complex working environment, CSOs continue to play a key role in supporting and complementing government policies and programs, especially at the local and regional levels where decentralization has expanded government mandates but has often not increased capacities.

The stakeholder consultation workshops and remote consultations undertaken during the profiling process provided opportunities to collect information on the operating environment in the hotspot. Stakeholders were asked to assess the operating environment for civil society in the 11 hotspot countries in terms of legal frameworks, political space and funding availability; the results are summarized in Table 7.3. This feedback from stakeholders suggests that, among the hotspot countries, Cameroon and Guinea are the most conducive to CSO engagement, with an enabling legal framework and political space, although funding availability remains variable by area and interest. The operating environments in Côte d'Ivoire and Togo were reported to be the least favorable for CSO engagement, due to their constrained legal frameworks and political space, although this is not reflected in the availability of funds for conservation activities in Côte d'Ivoire, perhaps because the high levels of biodiversity in certain areas of the country remain appealling to international donors.

Table 7.3 Perceived Operating Environment for CSOs in the Hotspot Countries

Country	Legal Framework	Political Space	Funding Availability
Benin	Enabling	Neutral	Constrained
Cameroon	Enabling	Enabling	Variable
Côte d'Ivoire	Constrained	Constrained	Variable
Equatorial Guinea	Constrained	Neutral	Constrained
Ghana	Enabling	Neutral	Variable
Guinea	Enabling	Enabling	Variable
Liberia	Enabling	Neutral	Variable
Nigeria	Enabling	Neutral	Constrained
São Tomé and Príncipe	Enabling	Neutral	Constrained
Sierra Leone	Enabling	Enabling	Variable
Togo	Constrained	Constrained	Constrained

Source: Consultation workshops and remote consultations between December 2013 and September 2015.

Ghana and Liberia are of particular interest because these two countries favor collaboration between government and CSOs. Both countries' legal frameworks were judged as enabling and as providing a neutral political space, which is an indication that the CSOs are given freedom to perform, so long as they contribute positively to the development of government policies. This is reflected in CSOs' substantive contributions to the development of the negotiation texts for the Voluntary Partnership Agreements between the EU and the governments of the two countries. However, the representatives from these two countries highlighted the fact that, although the relevant legal frameworks exist, there remain challenges with respect to weak implementation by government institutions. Funding availability for these two countries remains variable.

Nigeria is the only country in the hotspot where the legal framework on natural resource policies and legislations are implemented at two levels of government (federal and state). Although, this may be considered cumbersome, all CSOs in the country are required to register with the Corporate Affairs Commission at the federal level. Stakeholders from Nigeria highlighted that, with adequate understanding and management support, the process can be overcome, thus enabling CSOs to better access relevant funding at the appropriate levels.

Representatives from Côte d'Ivoire, Equatorial Guinea and Togo agreed that enacting favorable policy and legislation to support the creation of CSOs would be beneficial should it be paired with increased capacities of those CSOs at technical, institutional and financial levels. Most of the West and Central African governments' treatment of CSOs exacerbates the weaknesses that already exist in civil society. Governments typically regard autonomous CSOs with suspicion, particularly those groups that advocate for government reforms, such as the just redistribution and use of natural resource revenues. For home-grown CSOs, the result has been a lack of adequately informed and trained individuals, and an operating environment in which civil society is neither well understood nor organized.

Generally though, the increasing democratization of the hotspot's countries has led to improved civil society involvement in the conservation and sustainable management of the hotspot's natural resources, as well as increased cooperation between CSOs and governments. Some of the governments of the hotspot countries (e.g. Cameroon, Ghana, Liberia, Nigeria and Sierra Leone) are signatories to agreements that support partnerships between government and CSOs to assist in the management of natural resources. The forest convergence plan of ECOWAS recognizes the role of CSOs, while that of COMIFAC encourages the engagement of CSOs in forest conservation.

CSOs in some of the hotspot countries have also successfully engaged their governments and the private sector in the development of enabling policies for natural resource utilization and conservation. Of particular note are the engagement of Liberian CSOs in the development of the community rights law, the participation of Ghanaian CSOs in the revision of national forest and wildlife policies, and the development of biodiversity action plans for specific forest reserves in the Niger Delta through cooperation between Shell Petroleum Development Company and the Nigerian Conservation Foundation (NCF) in Nigeria. These plans were produced as a means of managing the company's biodiversity impacts in areas where they are operating, and also as a means of ascertaining compliance with the Shell Group's own biodiversity standard. Cameroon, Ghana and Liberia are also noted for the inclusion of civil society representatives in the composition of their national REDD+ working groups/steering committees. In Equatorial Guinea, CSOs worked with the government to promulgate a law prohibiting the hunting of large primates and other endangered species. In Cameroon, CSOs successfully advocated for a community forest reform that strengthened the management of community forestry by CSOs and CBOs. In São Tomé and Príncipe, CSOs such as MARAPA have been instrumental in promoting the sustainable management of key marine/coastal species and the protection of their habitats.

The discovery of new deposits of oil, gas and high value minerals in parts of the hotspot countries (e.g. Cameroon, Côte d'Ivoire, Equatorial Guinea, Ghana, Liberia, Nigeria and Sierra Leone) has introduced another dimension to the relationship between CSOs, government, and the private sector. Most of the oil and gas is located in coastal and offshore areas, except in Nigeria, where it is also found in the Niger Delta. When responding to social and environmental issues arising from exploration for and extraction of oil, gas and minerals, CSOs are increasingly finding themselves in conflict with both governments and the private sector, due primarily to the nature and scale of the operations, insufficient consideration of environmental impacts by the proponents, and a lack of adequate planning for the local communities in the areas where the extraction occurs. Stakeholders consulted during the profiling process resoundingly advocated for the strengthening of institutional capacity and the development of adequate skills among CSOs to help prevent and resolve such conflicts in future.

7.4 Capacity Needs

The collective capacities of the conservation-focused CSOs in the Upper and Lower Guinean Forests subregion were assessed by the stakeholders at the final consultation workshops in Monrovia and Limbé in August-September 2015, using a standard set of criteria and indicators developed by CEPF. Table 7.4 presents the results of this exercise, which are very similar for the two subregions, with the only substantive difference concerning the incidence of effective partnership mechanisms.

Table 7.4 Baseline of the Collective Capacities of CSOs in the Upper and Lower Guinean Forests Subregions

Criterion	Upper Guinean Forests subregion	Lower Guinean Forests subregion
i. Human resources Local and national civil society groups collectively possess technical competencies of critical importance to conservation.	Not met	Not met
	Partially met	**Partially met**
	Fully met	Fully met
ii. Management systems and strategic planning Local and national civil society groups collectively possess sufficient institutional and operational capacity and structures to raise funds for conservation and to ensure the efficient management of conservation projects and strategies.	Not met	Not met
	Partially met	**Partially met**
	Fully met	Fully met
iii. Partnerships Effective mechanisms exist for civil society groups to work in partnership with one another, and through networks with local communities, governments, the private sector, donors, and other important stakeholders, in pursuit of common objectives.	Not met	**Not met**
	Partially met	Partially met
	Fully met	Fully met
iv. Financial resources Local CSOs have access to long-term funding sources to maintain the conservation results achieved via CEPF grants and/or other initiatives, through access to new donor funds, conservation enterprises, memberships, endowments, and/or other funding mechanisms.	**Not met**	**Not met**
	Partially met	Partially met
	Fully met	Fully met
v. Transboundary cooperation In multi-country hotspots, mechanisms exist for collaboration across political boundaries at site, corridor and/or national scales.	Not met	Not met
	Partially met	Partially met
	Fully met	**Fully met**

Specifically, stakeholders from both subregions considered that collective knowledge and capacity within local and national CSOs could be rated as satisfactory or above in at least 50 percent of the technical competencies considered as priorities in the hotspot. Similarly, they agreed that at least 50 percent of CEPF priority KBAs had at least one local, national, or international CSO dedicated to their conservation with at least satisfactory institutional and operational capacity. However, considering partnerships, stakeholders from the Lower Guinean Forests considered that less than 50 percent of CEPF priority sites had fully institutionalized and sustainable partnerships dedicated to coordinating conservation and development actions among key stakeholder groups, while stakeholder from the Upper Guinean Forests felt that this figure should be between 50 and 90 percent for their subregion. As will be highlighted in Chapter 10, less than 50 percent of CEPF priority KBAs have access to stable and diversified long-term funding sources for conservation through support to local CSOs in both subregions. Lastly, stakeholders from both subregions considered that effective mechanisms for transboundary collaboration existed in at least 90 percent of the countries in the hotspot. However, due to the other criterion not being met, those collaborations are often very weak.

Information obtained through the stakeholder consultation workshops and remote consultations also provided an indication of the capacities of individual CSOs active in the hotspot. Most of the international CSOs working in the hotspot were deemed to have adequate institutional capacity and relevant technical expertise, although it was suggested that some could still benefit from additional financial resources considering the number of projects and activities that they undertake, coupled with a need to follow up on projects as results and impacts becomes visible. The majority of the local CSOs (see Table 7.1 for examples) considered themselves to have significant technical capacity, institutional and political knowledge and the requisite competence to execute their core mandates, albeit with inadequate knowledge in specific areas and, most importantly, a shortage of financial resources, as mentioned previously.

Apart from shortage of financial resources, the local CSOs consulted as part of the profiling exercise identified several key capacity needs that, if addressed, would enable them to engage more effectively in biodiversity conservation:

i. Technical training on conservation and sustainable management;
ii. Ability to engage with the private sector to mainstream biodiversity conservation into development;
iii. Training in project development and proposal writing, especially for leveraging that can lead to sustainable funding for conservation activities;
iv. Exchange visits for CSOs between and within hotspot countries, especially with international CSOs and large national organizations;
v. Training on organizational governance issues, especially accountability to local communities and other consituencies.

It should be reiterated here that capacity needs vary considerably among local CSOs. There are a number of CSOs in countries such as Cameroon, Ghana, Nigeria, Liberia and Sierra Leone that have institutional capacities deemed adequate to engage the government on conservation and sustainable use issues, while most CSOs in countries such as Benin, Equatorial Guinea, Guinea, São Tomé and Príncipe, and Togo are at an early stage of organizational development. These capacity differences may be related to the challenging operating environment for civil society in many of the hotspot countries, as well as the lack of a regulatory framework. Ghana Wildlife Society, Nigerian Conservation Foundation, and the Conservation Society of Sierra Leone (to mention a few) have benefited immensely from technical support from international organizations, such as BirdLife International, RSPB and WCS, with demonstrably positive results.

Representatives from the 11 countries that were consulted at the final consultation workshops in Monrovia and Limbé were asked to identify major barriers to effective civil society performance and to suggest how they could be best supported to overcome them (Table 7.5).

Table 7.5 Barriers to Effective Civil Society Performance in the Hotspot Countries and Priorities for Support

		Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea	Ghana	Guinea	Liberia	Nigeria	SãoTomé & Príncipe	Sierra Leone	Togo	Total
Barriers to performance due to inadequate:	CSOs technical and institutional capacities	x	x	x	x	x				x	x	x	8
	Access to public and other long term funding	x	x	x	x		x	x		x	x		8
	Project timeframe and design to obtain community ownership	x						x		x	x		4
	Process for establishing / recognition CSOs		x		x				x				3
	Communication / partnerships between CSOs			x			x			x			3
	Participation in policy formulation and implementation		x										1
Support needed with:	Building CSOs' technical and institutional capacities	x	x	x	x	x	x		x			x	8
	Building partnerships among CSOs	x	x	x		x		x		x	x		7
	Establishing transparent performance monitoring systems by CSOs		x	x		x	x	x		x			6
	Simplifying establishment/ recognition processes for CSOs		x		x				x	x		x	5
	Creating sustainable funding mechanisms		x	x			x	x			x		5
	Demonstrating CSOs contributions to Governments		x		x					x	x		4

Source: Final consultation workshops, August and September 2015.

Major barriers for CSOs in eight countries are lack of adequate technical and institutional capacity, as well as the difficulty in accessing fundings, including from their respective government. More specifically, when looking at their capacities, CSOs identified gaps at two levels: individual skills (such as leadership and financial management); and institutional skills (such as strategic planning, proposal development and reporting). The lack of funding options for CSOs (see Section 7.5) goes hand in hand with constraining timeframes. To obtain results in terms of sensitization, community ownership or development of alternative livelihoods often takes longer than the typical project cycles of international donors. This, in turn, creates fatigue and disenchantment among communities that are left on their own between projects. Limited and unstable funding was also perceived as a contributing factor to higher staff turnover. Trained staff members with the capacities to raise and manage funds too often leave their institutions for more stable employment and higher salaries within bigger institutions, the private sector and/or the government, thereby creating a vicious circle.

Fostering partnerships among CSOs, encouraging South-South exchanges between CSOs, and promoting mentorship by international NGOs are all perceived as positive pathways for civil society development (mentioned by CSOs from seven countries) along with recurrent training based on standardized modules (mentioned by CSOs from eight countries). Simplification of the public funding process would enhance CSOs access to government funding, should CSOs better align their funding needs and strategies with priorities of government as well as bilateral and multilateral donors. CSOs feel the need to put in place rigorous and more transparent performance monitoring systems including regular audits. This is another theme for which CSOs consulted requested dedicated training and support. Along with a dire need for the creation of sustainable funding mechanisms, such as Conservation Trust Funds, consulted CSO representatives highlighted the necessity of engaging in policy formulation and implementation processes, to demonstrate to government the important contribution that CSOs can make with their unique perspectives. This will require greater alignment of CSOs' agendas with government priorities and improved dissemination of information produced by CSOs via local-language media.

7.5 Funding Context

Funding for CSOs has long been problematic in the hotspot, not least because there is often little or no internally generated funding from the countries themselves. Most of the hotspot's CSOs rely solely on funds from developed countries for the implementation of their activities. Even then, few have been successful in supporting programs with funds from international donors over a sustained period of time, due in part to a typically low capacity for fundraising. A number have, however, developed partnerships with international NGOs, from whom they gain technical and fundraising support, and who can help them to access such funding sources that may be available locally (e.g. discretionary embassy funds and some private companies).

A large number of aid agencies, including AFD, Danida, le Fonds Français pour l'Environnement Mondial (FFEM), NORAD, the UK Department for International Development (DfID), the United States Agency for International Development (USAID) and the World Bank, among others, have shown interest in the conservation and sustainable management of biodiversity in the hotspot. Much of their funding has been directed towards governments and regional institutions and bodies (e.g. ECOWAS in West Africa and COMIFAC in Central Africa) and international NGOs. A small proportion of these funds also go to CSOs, most of which are either solicited directly from the aid agencies or contracted by governments to competent in-country NGOs. Most of the hotspot countries have remained among the aid agencies' priorities owing to their ongoing low levels of per capita income. However, in recent times, and particularly since some countries have discovered reserves of oil and gas (e.g. Côte d'Ivoire, Equatorial Guinea, Ghana, and São Tomé and Princípe), international donors are beginning to view them as 'middle-income' countries, and, hence, lower priorities for development assistance.

Most of the international development assistance that goes directly to local NGOs in the hotspot supports governance of the forest sector, especially following the African Forest Law

Enforcement and Governance (AFLEG) Ministerial Conference, held in Cameroon in 2003. AFLEG processes were aimed at galvanizing international commitment in Africa at a high political level in order to strengthen capacity for forest law enforcement, particularly with regard to illegal logging and hunting, associated trade and corruption. Some NGOs have, however, been supported financially in the areas of protection of biodiversity and research, such as IUCN and WWF in Cameroon, CI and FFI in Liberia, and RSPB in Sierra Leone (see Chapter 10).

7.6 Major Areas of Civil Society Engagement in the Hotspot

Over the last two decades, the hotspot's CSOs have been active in the forestry and environment sectors. In particular, they have been involved in work relating to forestry technologies, capacity building, research, networking, community mobilization and advocacy, among others. Table 7.6 below shows the percentage of CSOs working in the hotspot in each country that are engaged in different thematic areas.

Table 7.6 Civil Society Themes of Engagement in the Hotspot Countries

Country	Themes of Engagement (% of CSOs Engaged)					
	Conservation	Sustainable Management	Forest Governance Advocacy	Climate Change	Development	Others
Benin	80	67	33	67	73	27
Cameroon	41	27	38	32	24	5
Côte d'Ivoire	29	39	29	36	43	18
Equatorial Guinea	47	93	60	73	73	27
Ghana	22	49	56	67	62	13
Guinea	67	56	44	67	56	17
Liberia	62	46	58	77	58	19
Nigeria	47	57	66	72	55	9
São Tomé & Príncipe	100	100	38	50	75	13
Sierra Leone	71	86	57	91	48	5
Togo	86	71	57	57	36	14
Total	**49**	**54**	**50**	**61**	**51**	**13**

Source: Consultation workshops and remote consultations between December 2013 and March 2015.
Note: Percentages indicate the number of CSOs engaged in a certain theme in relation to the total number of CSOs in that country, based on data obtained by March 2015. Data on CSOs identified subsequently are not incorporated.

The most common theme of engagement by CSOs in the hotspot countries is climate change adaption and mitigation, with 61 percent of organizations focusing on this topic. This focus is possibly due to a current trend for international donors to support climate-change related activities (see Chapter 9), in addition to the CSO's interest in contributing to the international debate and support for the climate change adaptation and mitigation efforts. Other common themes that CSOs in the hotspot are working on include sustainable management of natural resources, rural development, forest governance and advocacy, and biodiversity conservation. Additional themes that smaller numbers of CSO are involved include access and benefit sharing, and traditional knowledge sharing.

7.6.1 Management of Protected Areas

International NGOs have long supported governments with the management of protected areas, mainly due to the lack of adequate capacity and funding within the governments themselves. Support to protected areas in the Upper Guinean Forests is being provided by CI and FFI in Liberia, WCF in Côte d'Ivoire, Guinea and Liberia, and RSPB in Sierra Leone. In the Lower Guinean Forests, support is being provided by WCS in Nigeria, IUCN in Cameroon and WWF in Equatorial Guinea, including on Annobón and Bioko islands. There has been relatively less support for the social aspects of protected area management, such as poverty reduction and participatory management, although these have become higher priority interests among international NGOs and donors in recent decades.

Several local NGOs are also involved in protected area management within the hotspot. For example, Ghana Wildlife Society (GWS) is involved with the management of several protected areas and other IBAs in Ghana, including Amansuri Wetland (GHA1). In the same country, A Rocha Ghana is currently involved in the conservation and sustainable management of several sites, including Atewa Range Forest Reserve (GHA3). In Nigeria, NCF is supporting the management of several protected areas, including Gashaka-Gumpti National Park (NGA5) and Okomu National Park (NGA10). NCF is also involved with the conservation and sustainable utilization of resources in the Niger Delta. In Sierra Leone, CSSL has played an important role in the protection of natural resources in the country, including through development of the Gola Rainforest Programme, in collaboration with the Ministry of Agriculture Forestry and Food Security (MAFFS) and RSPB. One of the most significant achievements of the project has been the 2011 declaration, by the President of Sierra Leone, of the Gola Forest Reserve as a National Park. Across the border in Liberia, the Society for Conservation of Nature in Liberia (SCNL) plays an important role in the management of the Gola Trans-boundary Peace Park.

7.6.2 Livelihood and Local Development

Around half of the national NGOs consulted during this profile implement livelihood and local development activities (Table 7.1), and the same applies for most international NGOs. This is an area in which national CSOs have had demonstrable success in the hotspot, and where they have a comparative advantage because of their relative proximity to local communities. Notable CSOs involved in livelihoods and local development activities included A Rocha Ghana, Conservation Alliance (CA) in Ghana, SDI in Liberia and WCS in Nigeria. The six BirdLife partner NGOs in the hotspot are also involved in livelihood and local development, based around building a network of Local Conservation Groups (LCGs) and other means of community engagement, and then providing support via a decentralized global secretariat.

CA, an offshoot of CI, is a non-profit, environmental NGO with activities related to improving livelihoods at the community level. CA brings together the people and skills needed to build Africa's capacity to conserve biodiversity through sound science, local initiatives and good governance. It also aims to assist fringe communities to create economic opportunities that result in improved wildlife and habitat management, and wealthier, healthier communities. It works with agricultural industries (e.g. cacao and oil palm producers) to ensure that best practices are followed in the use of natural resources. CA currently works in six hotspot countries (Sierra

Leone, Liberia, Côte d'Ivoire, Ghana, Nigeria and Cameroon), and in a number of KBAs (e.g. Ankasa Resource Reserve - Nini-Sushien National Park (GHA2) in Ghana).

It should be noted that, with important exceptions, livelihood projects implemented by conservation-oriented CSOs tend to be small in scale, and to be supported by short-term grants that often leave communities struggling to meet their objectives with the available time, funding and capacity. Some projects tend to be small-scale in nature and in some cases, external threats to target ecosystems and species (e.g. commercial hunting activity conducted by people from outside the community) far outweigh the internal threats (hunting within the community), thus minimizing the overall impact of community-based projects (Wicander and Coad 2015). These issues of scale need to be taken into account when developing grant portfolios in the hotspot.

7.6.3 Sensitization and Media Outreach

CSOs in the hotspot have been successful at a wide variety of awareness-raising activities. Such activities are typically implemented at the grassroots and national levels, depending on the issue(s) of concern. Awareness-raising activities at the national level include participation in 'United Nation Days' relating to the environment (e.g. World Environment / Forest / Wetland Day, to mention but a few).

Issues relating to conservation and sustainable use of natural resources seldom receive equitable media attention, not least because journalists have poor knowledge and understanding of the issues and other immediate human concerns are prioritized. In some countries, press freedom is curtailed to a greater or lesser extent.

7.6.4 Advocacy

Some CSOs have had an active history of environmental advocacy and lobbying in the hotspot. In Sierra Leone, the awareness created around 'blood diamonds', including the launching of the Campaign for Just Mining project, under the auspices of the Network Movement for Justice and Development (NMJD), helped to highlight CSOs' work on the link between natural resource utilization and violent conflicts. Despite the gains made over the years by CSOs in advocating for the rights of marginalized groups, there is a general lack of capacity to engage key stakeholders in the sector on issues such as disclosure of extractive revenues, monitoring of compliance with social and environmental legislation, economic policy, and protection of communities affected by natural resource utilization, among a suite of other concerns.

The experience to date of civil society advocacy in the hotspot also highlights the importance of networking among local NGOs for mutual support in advocating for policy reforms related to biodiversity conservation and for the application of environmental safeguards. Although advocacy outcomes are often mixed, they point to an emerging role for civil society within the hotspot in ensuring that good environmental policies are formulated and implemented. Such efforts are most effective when coalitions are formed that address threats to and from specific sectors, such as forest governance, as evident in examples from Ghana and Liberia on the signing of Voluntary Partnership Agreements (VPA) with the EU. The VPA is a trade agreement involving the EU and tropical timber exporting countries, with the proviso that any timber to be exported to any EU country must come from certified legal sources.

7.6.5 Community Mobilization

Communities affected by extractive activities, such as mining, generally lack the capacity to monitor impacts on water, air, soil and forest resources in and around the areas where the mining has taken place. They also often lack the ability to negotiate for appropriate compensation for losses of land and resources, and for impacts to their general livelihoods. CSOs play a key role in raising awareness about communities affected by mining. Nigeria and Cameroon both have national laws that dispossess citizens of their land rights, so that the government effectively owns both the mineral and land rights, while citizens are tenants (see Chapter 5 for a discussion of land use rights in the hotspot countries). In such cases, compensation is only paid for the loss of crops but not for the land on which citizens depend for their livelihoods. Apart from the fact that there is usually no satisfactory process of free, prior and informed consent before mining activities commence, when compensation is paid, it is typically neither adequate nor timely. These are among the key issues at the heart of the crisis in the Niger Delta in Nigeria and around Koidu in Sierra Leone.

7.6.6 Capacity Building

The stakeholder consultations revealed that training and capacity enhancement of local communities on their rights, roles, and responsibilities relating to conservation and sustainable use of natural resources is of great priority and importance in the hotspot. Such capacity building is not restricted to local communities but includes government agencies, elected representatives, smaller CSOs and national NGOs. In Ghana, district assemblies have benefited from such training, for example on participatory and gender-sensitive ways to support resource utilization. A capacity building role is common among almost all the CSOs active in the hotspot, with the exception of CBOs, which tend to be a recipient not a provider of capacity building.

Examples of CSO involvement in capacity enhancement include GWS's current implementation of the project "Enhancing the capacity and participation of local communities and District Assemblies in Environmental Monitoring and Decision Making in the Western Region of Ghana". The objective of this project is to secure the integrity of selected habitats and related livelihoods by increasing the participation of communities and district assemblies in environmental monitoring and decision making, in order to reduce the environmental threats of the emerging oil and gas industry in the Western Region of Ghana. Other organizations, such as SDI in Liberia, are also implementing similar projects at various locations within the hotspot.

7.6.7 Education and Research

The hotspot is endowed with a number of universities and research institutions that offer scientific knowledge and conduct research on topics relevant to conservation and sustainability within the hotspot. Universities and research centers identified and consulted during the profiling process, included: the Kwame Nkrumah University of Science and Technology in Kumasi, Ghana, the University of Sierra Leone in Freetown, Sierra Leone, the University of Liberia in Monrovia, Liberia, the University of Yaoundé in Cameroon, the Universidad National de Guinea

Ecuatorial in Equatorial Guinea and the University of Ibadan and the University of Science and Technology in Akure, Nigeria (Table 7.7). Among the 11 hotspot countries, Nigeria has the greatest number of public and private universities offering courses on the environment and other related disciplines.

Table 7.7 Examples of Universities and Research Institutions with Research Areas and/or Curricula Relevant to Conservation and Sustainable Use of Biodiversity in the Hotspot Countries

Country	Universities and Research Institutions
Benin	Universite de Parakou; Universite des Sciences et Technologies du Benin
Cameroon	University of Yaoundé, Institut de Recherche Agricole pour le Développement (IRAD), University of Buea, University of Dschang, Pan African Institute for Development, University of Douala, Oxford University Fisheries Institute in Yabassi, Smithsonian Institute
Côte d'Ivoire	Centre Suisse de recherches scientifiques (CSRS); Université de Cocody - Abidjan; Université d'Abobo-Adjame; Centre de Recherche en Ecologie, Abidjan
Equatorial Guinea	Universidad Nacional de Guinea Ecuatorial
Guinea	SAV/Farannah ; CU N'zerekore ; Cerescor ; IRAG ; Université de Conakry, Centre de Recherche Scientifque de Conakry; Centre National des Science Halientiques de Boussoura
Ghana	Kwame Nkrumah University of Science and Technology - Kumasi; University of Cape Coast, Cape Coast; Centre for African Wetlands; Forestry Research Institute of Ghana (FORIG)
Liberia	CARI; FTI; All Community Colleges in Liberia; CUC, UMU, SMPU; University of Liberia, Monrovia
Nigeria	University of Ibadan, Ibadan; University of Benin, Benin; Federal University of Technology, Akure; University of Calabar, Calabar; Forestry Research Institute of Nigeria (FRIN); A.P. Leventis Ornithological Research Institute (APLORI), Federal College of Wildlife, New Busa
São Tomé and Príncipe	Universidade Pública de São Tomé and Príncipe
Sierra Leone	University of Sierra Leone, Freetown; Njala University, Freetown; SLARI
Togo	Université des Sciences et Technologies du Togo; Université du Lomé, Université de Kara

7.7 Involvement of the Private Sector in the Hotspot

In all 11 hotspot countries, the private sector is the primary taxpayer and the secondary provider of jobs after the state. The major private sector companies operating in the hotspot, and which have notable implications for conservation, include logging companies, mining companies and large scale agribusinesses (see Table 7.8 for examples). The activities of this stakeholder group are often viewed as posing a threat to conservation and sustainable management in the hotspot. Overall, however, there is a lack of incentives for the private sector to develop, implement and comply with their corporate responsibilities, especially for small to medium size companies.

Table 7.8 Examples of Conservation Initiatives with Private Sector Involvement in the Hotspot Countries

Country	Description	Private Sector Involvement
Benin	There is no record of any private sector involvement in conservation efforts within the hotspot in Benin.	None
Cameroon	The WWF Forest and Trade Network members are involved in the conservation and sustainable management of the forest resources in some of the KBAs in Cameroon, especially following FSC Principles, Criteria and Indicators.	FSC-certified timber producing companies in Cameroon
	GIZ/KFW engages private sector to promote conservation approaches through work with contractorsand procurement approach. They give money to do conservation projects	Corporate social responsibility
	ERUDEF/APS: Man and nature	Enterprise cooperatives
	REACHOUT Cameroon – working with women on wealth creation in the Bakassi area in collaboration with oil companies – Haddax	Initiatives with oil industry
	City council of Nkongsamba promoting conservation and sustainable development	Enterprise cooperatives
Côte d'Ivoire	The WWF Forest and Trade Network members are involved in the conservation and sustainable management of the forest resources, especially following FSC Principles, Criteria and Indicators.	Timber companies carrying out logging operations in Côte d'Ivoire
Equatorial Guinea	There is no reliable information on private sector involvement in conservation activities on Annobón and Bioko islands.	None
Guinea	Company's environmental standards and corporate responsibilities as regards mining of natural resources as a measure of compliance.	ALCOA (works with Guinea Ecology); Rio Tinto Simfer (also works with Guinea Ecology); Guinea Aluminium Company (GAL) working with Guinea Ecology and WCF.
Ghana	The WWF Forest and Trade Network members are involved in the conservation and sustainable management of the forest resources. Payment of Social Responsibility Agreements (SRAs) to communities. Mining companies corporate environmental standards and payment of SRAs	Samartex – a logging company in Ghana. Anglo Gold Ashanti on gold mining.
Liberia	Company's environmental standards and corporate responsibilities as regards mining of natural resources as a measure of compliance. Ensuring local communities benefits economically from mining.	Arcelor Mittal works with CI and FFI; Hummingbird is engaging with stakeholders; GVL, Putu Mining Company, Equatorial Oil Palm, Same Darby, and Liberty Aureus Gold are also engaged to a certain extend in the conservation of biodiversity.
Nigeria	Availability of company's environmental standards and corporate responsibilities as regards mining of natural resources. Remediation and Rehabilitation of Biodiversity and Habitats of Oil Spill Sites in the Niger Delta.	Shell Petroleum Development Company

Country	Description	Private Sector Involvement
São Tomé and Príncipe	The Praia Yame Hotel HBD-BOAVIDA is involved in agro-industrial and ecotourism activities that facilitate the sustainable management of protected areas on the island of Príncipe. Most of these conservation functions are now the responsibility of a foundation linked to the company: the Príncipe Trust.	HBD-BOAVIDA
Sierra Leone	Company's environmental standards and corporate responsibilities as regards mining of natural resources as a measure of compliance.	National Environmental Fund for Corporate Social Responsibility.
Togo	There is no private sector presence in the small hotspot area of Togo.	None.

Source: Consultation workshops and remote consultations between December 2013 and September 2015.

There has often been little or weak interaction between the private sector and NGOs in the hotspot. The lack of engagement with the private sector, often due to inadequate technical capacity on the part of civil society, has been noted as a major issue that will need to be addressed, particularly in light of the deposits of oil, gas and minerals found at certain locations within the hotspot and the increasing demand for agricultural commodities. At the same time, a low level of interest among private sector companies in developing partnerships with civil society groups to enhance their environmental performance is evident in most of the hotspot countries, with the exception of some logging companies in Cameroon, Ghana and Liberia, who have signed up to recognized forest certification schemes, and some tourism operators in Ghana and elsewhere, who have shown a genuine interest in ecotourism.

Actions of civil society to hold the private sector accountable for its actions are limited in the hotspot. The few examples identified include the work of international organizations, such as WWF in Cameroon, Ghana, Côte d'Ivoire, and Liberia working through its Global Forest and Trade Network to persuade logging companies to adopt FSC certification. Other organizations, including BirdLife International, CI, FFI and TRAFFIC International, are also working with the private sector on wildlife trade in several hotspot countries. Activities by other CSOs, which aimed to ensure accountability within the private sector have had limited impact to date. For example, the work of A Rocha Ghana in reducing illegal gold mining at the Atewa Range Forest Reserve (GHA3) in the Eastern Region of Ghana encountered problems due to an inadequate technical and financial capacity to engage both legal mining companies and illegal ones.

Representatives from some of the private companies and CSOs involved in these projects have been consulted in Liberia to draw on successful approaches and potential recommendations for a better way forward. CI is working with the steel company Arcelor Mittal to ensure that local communities share the economic benefits of mining activities around East Nimba Nature Reserve in Liberia and are empowered to protect the natural resources they rely on. The approach is based on engaging local communities and NGOs and developing an environmental consciousness. Hummingbird Resources, a gold miner operating in Liberia, has engaged with local stakeholders and developed its environmental consciousness, the company still needs to improve on meeting its environmental commitments. In the agriculture sector, GVL, Putu Mining company, Sime Darby and Equatorial Oil Palm have all engaged with communities and attempted to implement an environmental approach but need to improve when it comes to land acquisition and their corporate responsibilities.

7.8 Partnerships and Networks

7.8.1 National Partnerships and Networks

Cameroon, Ghana and Liberia are the hotspot countries with the largest numbers of civil society networks and partnerships working on issues of conservation and sustainable management of natural resources (Table 7.9). Ghana has created National, Regional and District Forest Forums where issues of forest governance are discussed and consensus reached at the different levels. Cameroon and Liberia have also created working groups on forest governance and climate change. In Nigeria, the NGO Coalition for the Environment (NGOCE) is a coalition of all conservation CSOs in the Cross River state, which has a number of aims and objectives in common, including education, capacity building, research and facilitating national and international cooperation.

Table 7.9 Examples of National Civil Society Partnerships and Networks in the Hotspot Countries

Country	National Partnerships and Networks
Benin	Amis de l'Afrique Francophone - Benin.
Cameroon	National REDD Working Group; National VPA Working Group; Cameroon Committee of IUCN; National Gender Working Group; FGLG; REFADD; South West Civil Society Organisation Network (SWECSON); Association pour l'Etude Taxonomique de la Flore d'Afrique Tropicale (AETFAT); Colletif de Femmes pour la Protection des l'Enfant et de l'Environnement.
Côte d'Ivoire	National REDD Working Group; Tai-Sapo-Grebo Forest Complex Steering committee, Association des Femmes de Côte d'Ivoire; Alliance Ivoirienne pour l'Habitat; FLEGT.
Equatorial Guinea	REFADD.
Ghana	Forest Watch Ghana; National, Regional and District Forest Forums; National REDD Working Group; National REDD Gender SubWorking Group; National VPA Working Group; National Coalition on Mining; National Coalition of NGOs in Water and Sanitation; Ghana Climate Change Coalition; Western Regional Environmental NGOs Coalition; Landscape Management Board; FGLG.
Guinea	Forum des ONGs pour le Dévelopement Durable.
Liberia	National REDD Working Group; National VPA Working Group; Conservation Leadership Network; Tai-Sapo-Grebo Forest Complex Steering committee; Sapo Conservation Centre Steering Committee; Nimba Biodiversity Forum.
Nigeria	National REDD Working Group; Nigerian Youth Climate Coalition; Ogoni Interactive Youths Network; NGO Coalition for the Environmnet (NGOCE).
São Tomé and Príncipe	Federação da ONGs em São Tomé e Príncipe (FONG); RedeBios.
Sierra Leone	SLANGO and Environmental Protection Board.
Togo	Association Togolaise d'Etude, de Recherche et d'Appui au Development Humain Durable (ASTERADHD); Magnificat Environment Association.

Source: Consultation workshops and remote consultations between December 2013 and September 2015.

7.8.2 Regional and Subregional Partnerships and Networks

Eleven regional or subregional partnerships and networks led by or involving CSOs were identified during the consultation process. CSOs from the hotspot countries are involved or associated with the objectives and activities of the following networks:

i. **The African Forest Forum (AFF).** AFF has its West African component based in Côte d'Ivoire. This network's major objective is to promote forest conservation.
ii. **The African Forest Action Network (AFAN).** AFAN an informal group of NGOs established in 1994 to promote the sustainable use of African forests. This network promotes the conservation of forests and the sustainable use of forest resources, particularly for the wellbeing of the people. The activities carried by AFAN include dissemination of information and exchange experiences among members with other networks, and other organizations, and coordination of advocacy activities in the field of sustainable management of forests.
iii. **Climate Action Network (CAN) West Africa.** CAN is a worldwide network of more than 900 NGOs in over 100 countries working to promote government and individual action to limit human-induced climate change to ecologically sustainable levels. CAN members work to achieve this goal through information exchange and the coordinated development of strategies on international, regional and national climate issues. CAN West Africa was formed in 2008, covering West and Central Africa, and currently has 41 member organizations.
iv. **Green Advocates for West Africa (GAWA).** GAWA is a network consisting of members from the 16 member states of ECOWAS, eight of which are hotspot countries (Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone and Togo). These countries represent a diverse range of ecosystems, people and political structures. GAWA members represent the diversity of the region and are active in all aspects of environmental activism. Participating groups include national networks, higher education institutions, international NGOs, national NGOs and other CSOs. Their combined knowledge-base allows the network to draw upon experts in all of the GAWA thematic issues, and ensures that the unified environmental voice is representative of the entire spectrum of society. The GAWA network is an effort to unite the environmental movement across the region and better inform those outside of West Africa of the challenges faced and successes realized.
v. **Women's Network for Community Management of Forests (REFACOF).** REFACOF is a network of women involved in the sustainable management of forest resources in Africa. The network was formed at the 2009 International Conference on Forest Tenure, Governance and Enterprise, held in Yaoundé, Cameroon. REFACOF's goal is to advocate with governments and international organizations for the inclusion of women-specific needs, constraints and interests, as well as their ownership rights to land and forest resources in reforms and the political agenda.
vi. **Global Forest and Trade Networks.** This is a global initiative of WWF, which, in West and Central Africa, supports companies and individuals that are committed to responsible forest management and trade in forest products to meet the requirements of sustainable forest management and certification. The core business of the networks in the two subregions is to provide technical support and guidance on forest and chain of custody

certification and sustainable forest management, facilitate timber trade links among companies and individuals committed to responsible forest management and forest product trade, and build local capacity on forest certification and auditing techniques. The network also undertakes education and awareness-raising activities in forest fringe communities on local peoples' rights and responsibilities in forest management and, in particular, on communities' engagement in Social Responsibility Agreements with logging companies.

vii. **Réseau des Aires Protégées d'Afrique Centrale (RAPAC).** RAPAC is a non-profit organization whose members include both governments and NGOs working for the preservation of protected areas in Central Africa. Its aim is to harmonize conservation approaches, facilitate the exchange of experiences, and improve coordination and support its members (technically and, to some extent, financially, playing the role of a hub for international funding). Among the hotspot countries, Cameroon, Equatorial Guinea, and São Tomé and Príncipe are the ones whose protected areas are involved in this network.

viii. **Congo Basin Forest Partnership (CBFP).** This partnership comprises governments of the Congo Basin countries, representatives of the donor community, conservation NGOs, forest research centers and private sector associations. Launched in Johannesburg in 2002, CBFP is the regional body in charge of forest and environmental policy, coordination and harmonization, with the objective of promoting the conservation and sustainable management of the Congo Basin's forest ecosystems. Within the hotspot, Cameroon, Equatorial Guinea and São Tomé and Príncipe are all involved in CBFP.

ix. **Forest Governance Learning Group (FGLG).** FGLG is an alliance of independent CSOs working in 10 countries, including Cameroon and Ghana. The activities of the groups include learning exchanges and the development of ideas on practical, just and sustainable forest governance. This is an alliance of independent CSOs and research institutions that promote sustainable forest management through strong and inclusive governance structures and processes (e.g. democratic institutions, policy and legislative reforms, etc.).

x. **Network of African Women for Sustainable Development (REFADD).** This network's main objective is to increase the participation of women in natural resource management and biodiversity conservation through the promotion of the participation of CSOs in the development and implementation of national programs on natural resource management and biodiversity conservation. Within the hotspot, the network has national branches in Cameroon and Equatorial Guinea.

xi. **Network of Youths for the Sustainable Management of the Central African Moist Forest Ecosystems (REJEFAC).** This network's main objective is to ensure full participation of vulnerable people, especially youth and women, in decision-making process. They are advocates for sustainable development and the effective consideration of the roles of children, youth and women in public policy. REJEFAC is present in Cameroon within the hotspot.

One major priority that was frequently reiterated during the consultation processes was the importance of building partnerships and working with networks. It came out strongly that most CSOs do not have the capacity to independently raise funds, whether from within or outside of their own countries, and that working collectively can help them secure the resources they need to sustain their programs.

7.9 Conclusion

Civil society serves as a uniting force within the hotspot and should work towards making positive, long-term impacts on the region's development. Civil society can be the voice of the marginalized population as a whole, and serves as a critical link between society and the state. Civil society also plays an educating and supervisory role and facilitates community outreach and capacity-building measures.

Civil society has struggled to define its relationship with the state in many hotspot countries, with some governments fearing that civil society will usurp state responsibilities. Consequently, governments have sought to maintain control over the activities of CSOs, to a greater or lesser extent. Stakeholders consulted for this profile expressed frustration that governments often exclude civil society from policy-making processes. Civil society representatives believe they can play a role that complements state efforts to rebuild society and enhance sustainable development, working in remote locations and using innovative methods that bring together actors from different sectors.

There are significant variations among the national CSOs in the hotspot, both in terms of their technical competence and their levels of financial resources available for their conservation activities. The international CSOs involved in the hotspot are typically better equipped both technically and financially, and they often perform better by working with national CSOs. Financial sustainability (or a lack thereof) was a recurring theme throughout the consultation process.

The existence of regional and national partnerships and networks in the hotspot countries was viewed as positive, as it represents a key strategy to overcome the technical and financial constraints facing CSOs. Maintaining partnerships and networks, and thus facilitating experience-sharing, will help contribute towards building the capacity of organizations to influence national policies and regulatory frameworks. There is a need to promote greater cooperation and coordination between international CSOs, national CSOs, donors, and the governments of the hotspot countries. This will lead to the development of additional networks, and can facilitate the long term sustainability of CSOs in the hotspot.

Strengthening the capacity of the hotspot's CSOs will be an important step towards increasing their overall conservation impact. Some CSOs are unable to influence public policies due to the lack of enabling regulatory frameworks. CSOs need to have the capacity to hold government and the private sector accountable, and to ensure that local communities in their respective countries are aware of their rights and responsibilities. Many CSOs have close links to local communities and are well placed to contribute to the strengthening of community capacities, and to enable the people to carry out collective actions for the betterment of the environment.

CSOs within the hotspot face several structural, logistical and political obstacles. Structurally, civil society continues to lack unity and clarification of purpose. Many disparate CSOs represent small groups focused on specific issues, rather than on the interests of society in general.

CSOs in the hotspot need to improve on their approaches and means of communication and information sharing. They also need to improve levels of cooperation between each other, and to establish mechanisms that will allow for self-monitoring and regulation. The capacities of CSOs in the hotspot countries (and especially in Benin, Côte d'Ivoire, Cameroon, Equatorial Guinea, Guinea, and Sáo Tomé and Príncipe) will need to be improved so as to effectively take up a watchdog role. They will also need to build their social capital and increase the trust of the local communities in their respective countries.

Finally, a gap in the understanding of how CSOs can effectively engage with the private sector is apparent, and it will be important to support the CSOs in the hotspot with a view to increasing their capacities in terms of interest-based negotiation skills, which will ultimately enable them to engage positively with both governments and the private sector.

8. THREATS TO BIODIVERSITY IN THE HOTSPOT

This chapter presents an overview of the main threats to biodiversity and natural ecosystems in the hotspot. The main information sources include the IUCN Red List, threat-related datasets from Co$ting Nature, the IUCN/UNEP "Situation Analysis Desk Study on Terrestrial and Freshwater Fauna in West and Central Africa", published literature, and stakeholder inputs received through the workshops and remote consultations. The chapter is divided into a description of the main threats confronting the hotspot, as well as specific species, sites and corridors found within, including the major principal actors involved (Section 8.1); a description of the drivers and root causes of these threats (Section 8.2); a review of the major barriers that are hindering conservation within the hotspot (Section 8.3); and suggestions of possible solutions that can help overcome the these threats, drivers and barriers (Section 8.4).

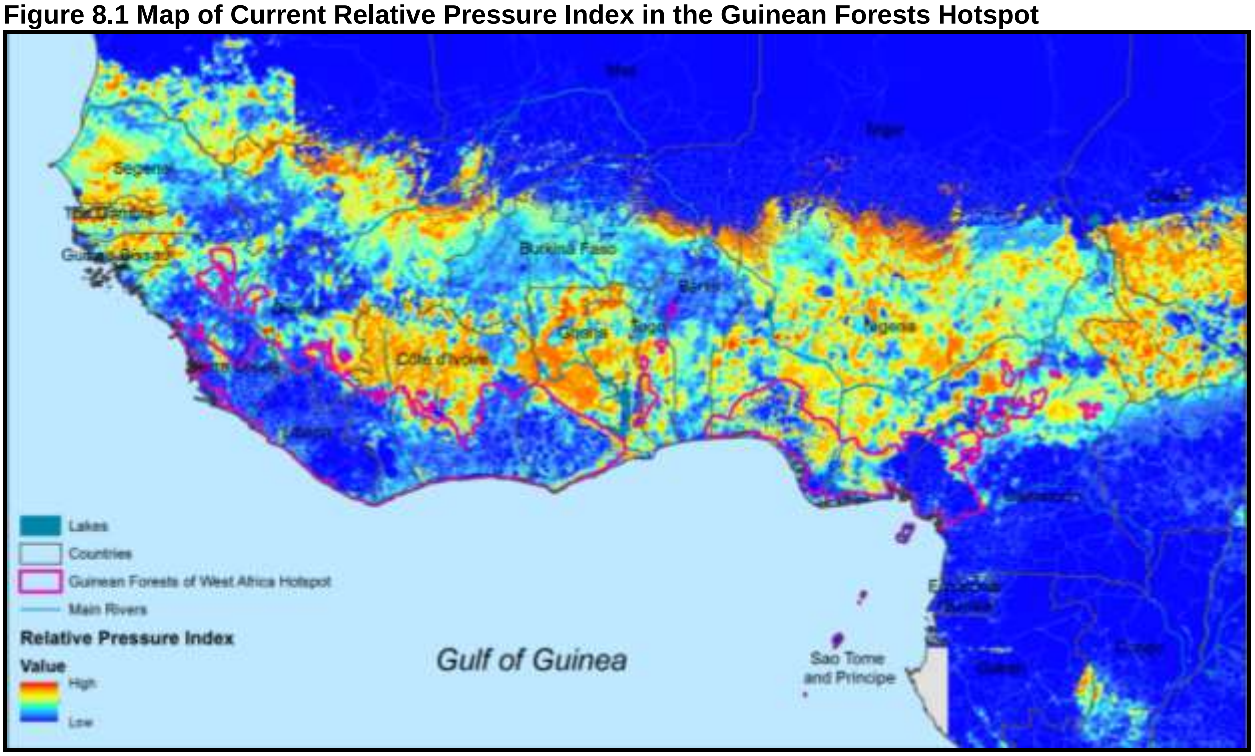
8.1 Key Threats and Baselines

West African rainforests have been greatly modified by people: a conservative estimate is that around 10 million hectares of forest were lost in the 20th century (Fairhead and Leach 1998 cited in Norris *et al.* 2010, Li *et al.* 2007). Agricultural expansion has been the most significant cause of deforestation and 80 percent of original Guinean Forests can now be considered as an agriculture-forest mosaic (Norris *et al.* 2010). Today, forests have been, and continue to be, cleared or degraded to allow for expanding areas of agriculture, including for commercial crops, as well as urban expansion and industry, roads and infrastructure. A number of these threats emerged as priorities through the analysis, and are examined in greater detail below.

A general baseline of overall threats to biodiversity in the hotspot has been provided through remote analysis using two approaches. Figure 8.1 below shows an assessment of the Relative Pressure Index in the hotspot, produced using Co$ting Nature. This indicates current areas of high to low pressure on ecosystems, based on population, wildfire frequency, grazing intensity, agricultural intensity, dam density, and density of other infrastructure (i.e. mines, oil and gas facilities and urban areas). As shown in Figure 8.1, the areas potentially experiencing the highest levels of pressure are in the northern zones of the hotspot, such as along the northern boundary of the hotspot in Côte d'Ivoire and Ghana. There are also extensive areas of the hotspot in Nigeria, as well as areas in Togo and central Sierra Leone, where the pressure index is shown to be medium-high. Notably, the forest regions that form the core of the hotspot are regarded as experiencing low to moderate pressure according to this composite pressure measure. This is not to say that wildlife populations within these forests are not under severe pressure but only that the forests themselves are not being rapidly degraded, fragmented or converted.

In terms of a forest cover baseline, recent work on understanding tree cover loss and gain for 2000-2012 (Hansen *et al.* 2013), reveals both the status and trends for the hotspot. Figure 8.2 shows tree cover loss in the hotspot and surrounding areas over 2000-2012. Tree cover loss is evident throughout most parts of the hotspot (with the exception of São Tomé and Príncipe) but is especially prevalent in southern Côte d'Ivoire and Ghana, as well as several parts of Sierra Leone, Nigeria and Cameroon. The lack of tree cover loss in São Tomé and Príncipe is most likely due to the small size of the country relative the scale of the analysis, as significant losses of forest cover and increases in forest degradation have been reported (IFAD 2014).

Figure 8.1 Map of Current Relative Pressure Index in the Guinean Forests Hotspot



Source: Co$ting Nature.

However, there have also been small areas of tree cover gain over this period. When examined closely, the gains are found throughout the agricultural mosaic and into Guinean savanna habitats, as well as near cities. In savanna areas along the northern margin of the hotspot, especially in Guinea and Sierra Leone, CO_2 fertilisation and collapses in populations of large mammals, like elephants, encourages the growth of trees. In other areas, tree cover gains suggest that land-use practices in these areas can also result in positive changes in tree cover (Hansen *et al.* 2013). However it should be noted that much of this is believed to be the growth of useful exotic and indigenous species that provide food and building materials but do not necessarily have the same biological values, such as provision of habitat for wildlife, as the natural savanna vegetation that it might have replaced.

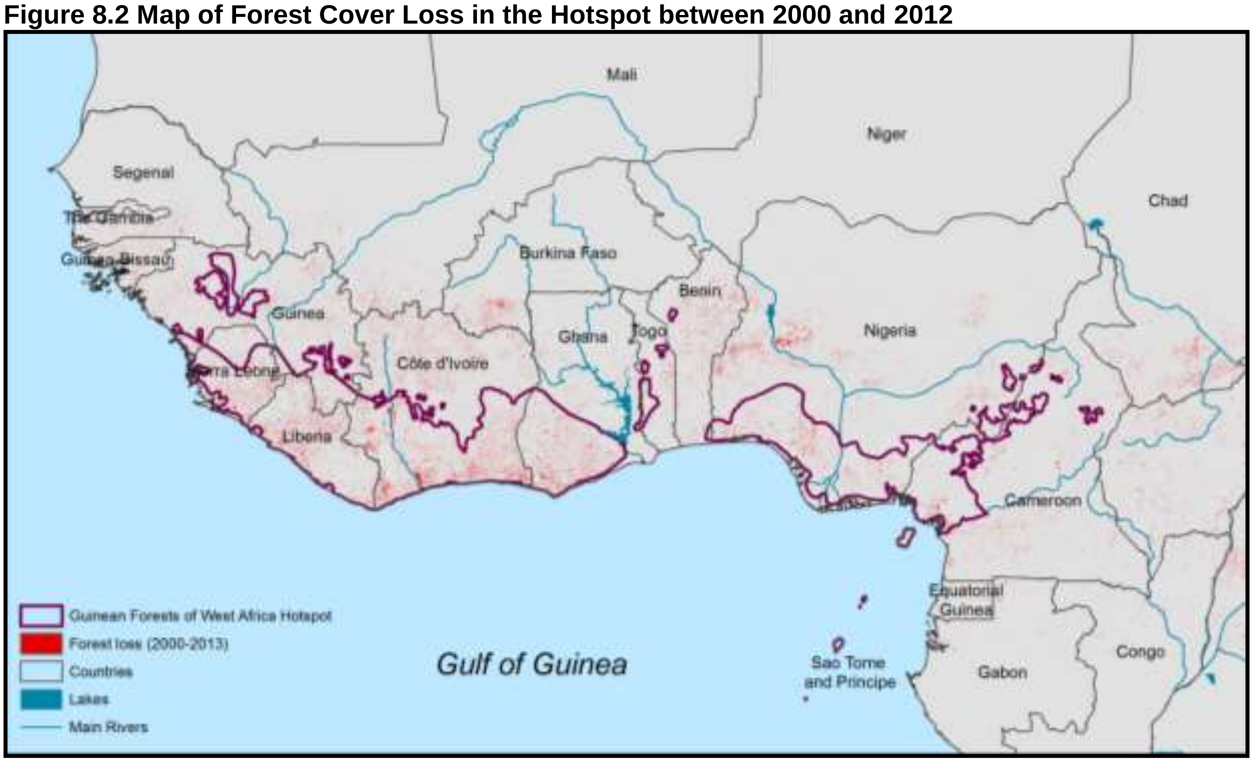
Table 8.1 Loss, Gain and Net Loss of Tree Cover between 2000 and 2012 in the Hotspot Countries

Country	Rank (out of 180 Countries)	Total Loss (km^2)	Total Gain (km^2)	Net Loss (km^2)
Benin	60	3,307	69	3,238
Cameroon	48	4,816	651	4,165
Côte d'Ivoire	22	14,889	2,298	12,591
Equatorial Guinea	107	439	56	383
Ghana	43	5,406	1,345	4,061
Guinea	55	3,933	296	3,637
Liberia	54	3,955	1,084	2,871
Nigeria	31	10,239	603	9,636
São Tomé and Príncipe	Unknown	Unknown	Unknown	Unknown
Sierra Leone	72	1,967	451	1,516
Togo	95	768	24	744

Source: Hansen *et al.* (2013) supplementary data.

Taking consideration of losses and gains in tree cover, there is generally a net tree cover loss in most parts of the hotspot (with the exception of São Tomé and Príncipe). Côte d'Ivoire lost the highest amount of tree cover, 1.25 million hectares, during this period, with the net loss in other countries ranked in Table 8.1. Although on São Tomé and Príncipe data on net loss of tree cover are not available, anecdotal evidence suggests that a realistic estimate of loss would be around five percent between 2000 and 2012 (R. Lima pers. comm.).

Figure 8.2 Map of Forest Cover Loss in the Hotspot between 2000 and 2012

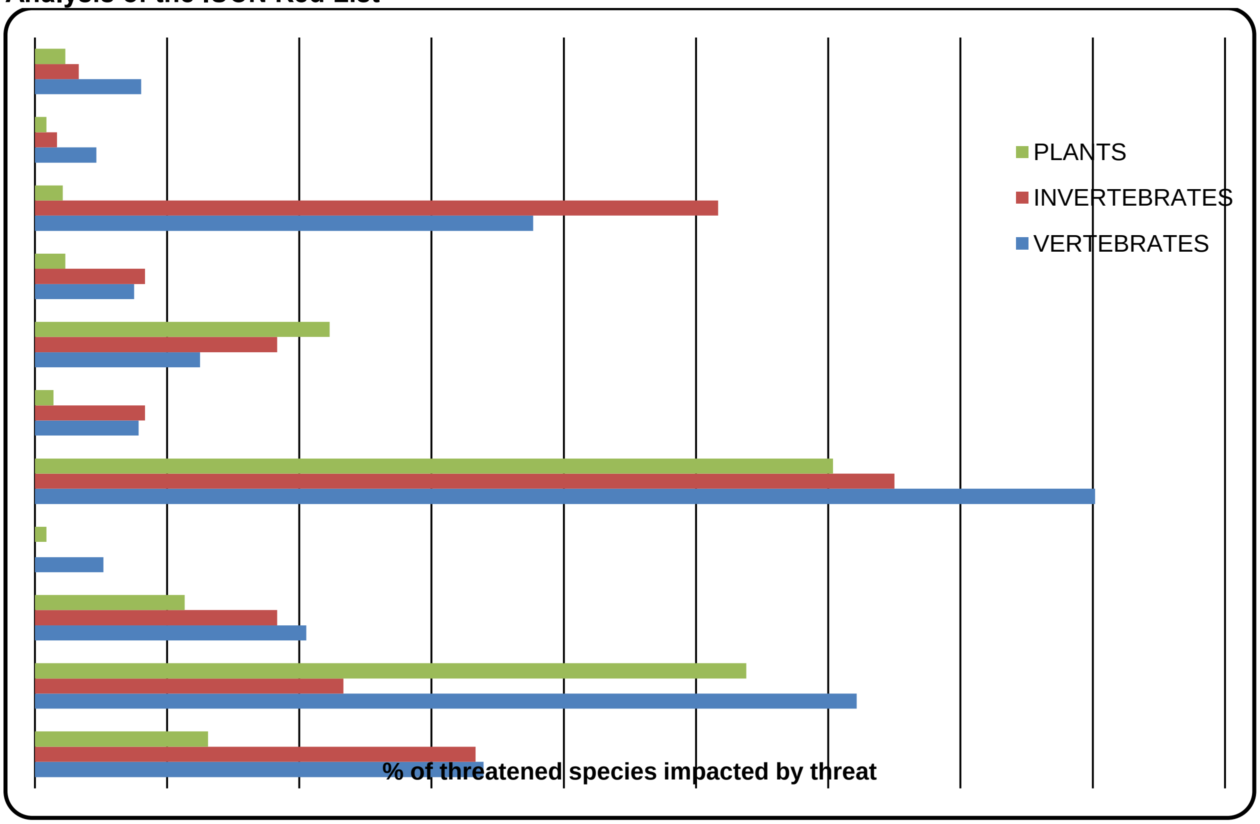


Source: Hansen *et al.* (2013).

The classification of threats in this study follows the IUCN standardized threat categories, which are used for the Red List to maintain consistency among countries and to allow regional analysis. Threats to species, sites and corridors in the hotspot have then been ranked in two ways. Figure

8.3 shows the ranking according to threats to Red Listed species (marine, freshwater and terrestrial) in the hotspot, based on the IUCN threat classification. An alternative ranking, based on expert opinion, was conducted through the stakeholder consultations, again using the IUCN threat categories (Table 8.2). In both approaches, biological resource use, agriculture and aquaculture, and pollution emerge as key threats. Table 8.3 also shows that workshop participants considered energy production and mining, transportation and service corridors, human intrusions and disturbance, climate change and severe weather, and residential and commercial development to be among the main threats to biodiversity in the hotspot. Recognising that the IUCN threat classification provides a global framework for analyzing threats under Red List criteria, rather than a locally specific threat framework, participants were also asked to list any additional threats affecting their part of the hotspot. Additional threats identified by representatives from Nigeria and Togo are shown at the end of Table 8.2.

Figure 8.3 Major Threats to Species Thought to be Present in the Hotspot, According to an Analysis of the IUCN Red List



Source: IUCN Red List version 2013.
Note: The chart is based on an analysis of 4,666 assessed species in all categories (i.e., Extinct to Data Deficient), in the terrestrial, marine and freshwater realms.

The key threats are described in detail below, ordered according to the threat rankings assigned by workshop participants (Table 8.2). In the descriptions that follow, the naming of the threats has been sometimes altered from the original IUCN threat categorisation, in order to better reflect the nature of the threat in the hotspot.

8.1.1 Unsustainable Biological Resource Use

In both the analysis of threats to IUCN Red Listed species (Figure 8.3) and the threat rankings by workshop particpants (Table 8.2), biological resource use emerged as the most severe threat to biodiversity in the hotspot. Further consultation and research shows that this threat category can be broken down into: hunting for bushmeat and wildlife trade; logging; and overfishing.

Table 8.2 Prioritized Threats in the Guinean Forests Hotspot

IUCN Threat Category	Threat Ranking by Workshop Participants from Country											Rank Totals	Hotspot Ranking
	Benin	Cameroon	Equatorial Guinea	Guinea	Ghana	Côte d'Ivoire	Liberia	Nigeria	SãoTomé & Príncipe	Sierra Leone	Togo		
Biological resource use	1	1	1	1	1	1	2	1	1	-	1	11	1
Agriculture and aquaculture	2	1	2	1	1	1	1	1	1	-	1	12	2
Energy production and mining	2	2	3	1	1	1	1	1	2	-	3	17	3=
Human intrusions and disturbance	1	3	3	3	1	1	1	1	2	-	1	17	3=
Climate change and severe weather	2	3	2	2	1	2	1	2	2	-	2	19	5
Pollution	1	2	3	3	1	2	2	1	3	-	2	20	6=
Natural system modifications (e.g. dams, fires)	2	3	3	1	1	2	1	3	2	-	2	20	6=
Transportation and service corridors	3	3	1	2	2	2	1	2	3	-	2	21	8
Residential and commercial development	3	3	1	2	1	3	2	1	3	-	3	22	9=
Invasive and other problematic species and genes	2	3	3	2	1	3	3	2	1	-	2	22	9=
Geological events	3	3	3	3	3	3	3	3	3	-	2	29	11
Other threats (outside of IUCN categories)													
Insecurity and conflict in the Delta								1					n/a
Enclaves								1					n/a
Livestock grazing /pastoralism								1			2		n/a
Erosion (montane and coastal)											2		n/a

Notes: This table summarizes the ranking of threats to biodiversity based on the IUCN categories during the national consultation workshops, according to the ranking: 1 = severe; 2 = moderate; 3 = minor/not relevant. The rankings given by participants have been interpreted and standardized by the authors to present them in this table, as each group used slightly different ways to provide their feedback. Due to travel restrictions imposed following the Ebola outbreak, participants from Sierra Leone were unable to participate in this exercise.

Bushmeat Hunting and Wildlife Trade

Hunting traditions are strong in the hotspot countries, and for rural communities, bushmeat consumption has historically represented a significant source of protein. The threat to biodiversity posed by bushmeat consumption and trade has proved very difficult to address, and there are mixed assessments in the literature of its impact on biodiversity. As noted in Section 5.4.2, offtake to supply local rural needs is probably not very harmful, whether consumption or sale is involved. Studies from parts of Cameroon show that, in certain forest areas, the main sources of bushmeat come from traps set in fields and fallows to protect crops as well as catch animals (Endamana 2013a; Endamana 2013b). Other papers (e.g. Vega 2013) report similar findings. However, professional hunters also supply urban markets, and there is an illicit trade in bushmeat to West African nationals living abroad (Section 5.4.2 provides more information on the scale of the trade).

The productivity of forest systems, in terms of their ability to support high densities of large mammals is much lower than savanna systems in Africa. It is, therefore, fairly easy to over hunt and effectively remove large-bodied mammals from the forest systems of the hotspot (Bennett 2002; Bennett *et al.* 2007). Bushmeat hunting is, thus, considered a major threat to some species in West Africa (Wicander 2012), including the hotspot area. For example, Jentink's duiker, an Endangered species with a global range restricted to the Upper Guinean Forests subregion, is declining due to hunting and deforestation. It is only in places such as Parc National de Taï et Réserve de Faune du N'Zo (CIV11), Grebo (LBR7), Sapo National Park KBA (LBR14) and Western Area Peninsula Non-hunting Forest Reserve (SLE8) that prospects for the species's long-term survival are hopeful. As another example, Preuss's monkey, an Endangered species globally restricted to western Cameroon, eastern Nigeria and Bioko island, has declined by more than 50 percent over the past 20 to 30 years. This species is semi-terrestrial and relatively large-bodied making it very attractive to hunters, particularly on Bioko, where it has declined most significantly.

Globally, bushmeat hunting has been recognized as one of the largest threats to tropical forest biodiversity (Wilkie *et al.* 2011, Harrisson 2011, Abernethy *et al.* 2013), even in remote forest areas (Fa *et al.* 2002, Abernethy *et al.* 2013). Several studies have documented the decline of various mammal species throughout the Afrotropical region (see review in Bowen-Jones and Pendry 1999, Walsh *et al.* 2003), and with around 100 people per km^2, the average population densities are almost two times higher than the region's ability to sustainably supply the demand for bushmeat (Bennett 2002).

Most large mammal populations have already been depleted to very low levels in West Africa, which has left forests with a fauna of smaller, more rapidly reproducing species (Bennett *et al.* 2007). Although there is a lack of comprehensive and recent assessments specific to the hotspot, there are studies to support this claim. In Ghana, for example, a study revealed that bushmeat trade may have reached 'post-depletion sustainability', meaning that large mammal populations are so severely reduced that almost exclusively smaller mammals able to withstand current hunting levels are being extracted (Cowlishaw *et al.* 2005). Large mammals such as pygmy hippopotamus in Liberia and West African manatee in Ghana are believed to be threatened by hunting (ACET 2014), and changes in the abundance of these species brought about by hunting for consumption or trade can have broader impacts on ecosystem health (Abernethy *et al.* 2013).

For example, the removal of large seed dispersers, such as elephants and gorillas, has consequences for forest diversity and regeneration (Effiom *et al.* 2013; Harrison *et al.* 2013), and potentially its carbon storage capacity (Brodie and Gibbs 2009).

Hunting pressure due to demand for bushmeat is a threat to several Priority 1 and 2 terrestrial KBAs. For example, overharvesting for the bushmeat trade threatens the Endangered Maclaud's horseshoe bat (Fahr 2008), which is known from Konkouré (GIN6), a Priority 1 KBA on the coast of Guinea. Elsewhere, hunting may be the most serious threat to the Critically Endangered dwarf olive ibis, known only from São Tomé, which is apparently a secondary catch for pig hunters (BirdLife International 2013c).

Apart from the bushmeat trade, there is some evidence of the impact of wildlife trade on biodiversity in West Africa broadly and the hotspot more specifically. In terms of legal international trade in CITES-listed species, West African, South American and South East Asian countries were the main exporting countries of wild birds over the period 1996-2010, although legal trade from these countries has declined in recent years (UNEP-WCMC 2013). One study also points to the common practice of hunting African pottos (*Perodicticus* spp.) and angwantibos (*Arctocebus* spp.) for meat and medicine (and sometimes the pet trade), particularly in Nigeria (Svensson and Friant 2014).

Although habitat loss remains the most significant threat to the hotspot's great ape populations, they are also trafficked. Information on countries of origin is limited but, from 2005 to 2011, 643 chimpanzees, 48 bonobos (a species that does not occur in the hotspot), 98 gorillas and 1,019 orangutans (also not in the hotspot) are recorded as lost from the wild through illicit activities, based on seizures and arrival rates at sanctuaries in 12 African countries and Indonesia, as well as expert reports (Nellemann *et al.* 2014). Based on extrapolations, Nelleman *et al.* (2014) estimate that as more than 22,000 wild great apes were lost between 2005 and 2011 through illegal trade, with chimpanzees comprising 64 percent of the toll. Although the recent resurgence in ivory poaching is focused on Central and East Africa, it has also impacted elephant populations in the hotspot countries. Monitoring the Illegal Killing of Elephants (MIKE) data for West Africa shows that the overall losses are small but that poaching levels are increasing (CITES-MIKE Programme, West Africa, 2013). In the most egregious case, 650 African elephants were killed in Cameroon's Bouba N'Djida Park in 2012 by heavily armed poachers (Lawson and Vines 2014).

Logging

Threats to biodiversity posed by logging in the hotspot vary significantly among countries and according to the type of logging being undertaken. For example, almost 30 percent of the 269 amphibian species in the hotspot are threatened due to the habitat loss/degradation resulting from expanding logging and agricultural expansion.

In the past, production forestry and commercial timber extraction were large industries in many hotspot countries, leading to the clearing of large forest areas. They thus had direct impacts on forests and wildlife in the hotspot. In recent years, the situation has changed, with a reduction in the number of concessions and the contraction of logging industries. In most countries in the hotspot, timber is no longer a major export commodity, with the main exception being Cameroon (see Section 5.3.2).

In Cameroon over 1 million hectares of forest was felled between 2000 and 2005, due to a mix of commercial logging (legal and illegal), domestic fuelwood demand and agricultural expansion. As this figure is at the national level it is unknown what proportion was in the hotspot. Logging of commercial timber species constitutes one of main threats within the Lower Niger Delta (Corridor 8), as well as the Northern Gulf of Guinea Drainages, where extensive logging is linked to subsequent land-use change (Burgess *et al.* 2004).

In Liberia, before the current democratic government, the area of logging concessions awarded was around 2.5 times the entire area of forest in the country, with multiple overlapping concessions. Their legality and status was reviewed and all concessions cancelled in 2006 (UNEP 2008). Similarly, all forest concessions in Equatorial Guinea were cancelled in 2008 (de Wasseige *et al.* 2012).

Commercial logging can be well-managed and may itself cause only modest negative impacts on biodiversity, or indeed these impacts may be positive: new growth in open spaces attracts wildlife of all kinds (TerHeegde and Rietbergen 2008). However, the secondary effects of commercial logging can be devastating for biodiversity. Logging roads offer easy pathways into remote forest areas for poachers, farmers and settlers, until they grow over a year or two after. Logging companies (see Appendix 9) who practice reduced-impact logging (e.g. who remove bridges once use in a particular area is over, and who supply their workers with meat, rather than leaving them to go hunting in the evening) are rare. Nevertheless, there has been an increase in FSC certification of companies in the hotspot countries in recent years, which has helped to improve practices (see Section 8.4.2).

Informal and illegal logging also continues to threaten biodiversity in the hotspot. Small-scale companies tend to operate illegally and are responsible for much forest fragmentation, for example in Cameroon and Ghana. Many small-scale companies are well-positioned in local markets and use their ties with local administrations and national governments to avoid the costly charges that would be required under stringent law enforcement. In Ghana, Hansen and Treue (2008) estimated that 70 percent, or around 2.5 million m^3, of timber was illegally cut each year between 1996 and 2005, often using informal ‘chainsaw’ logging gangs. Illegal logging (large and small-scale) is also still problematic in Cameroon, Côte d’Ivoire and Nigeria.

Information on specific KBAs that logging might be affecting is limited. However, Mount Lefo (CMR13), Omo Forest Reserve (NGA11) and Afi River Forest Reserve (NGA1) are all known to be under threat from logging, with the latter site being assessed as facing “very high” threat (BirdLife International 2015). In Cross River State, a ban on logging concessions (instituted in 2009) and the establishment of an Anti-deforestation Taskforce had not fully prevented illegal logging from continuing in the state’s forests; reportedly, the ban is being reconsidered and the taskforce has been dissolved, leading to speculation that logging concessions will be granted in the state’s forest reserves again in the near future (for example, see MyCrossRiver.com 2015).

On São Tomé island, most timber outside of protected areas is of poor quality, despite 90 percent of the island being described as forested (de Lima *et al.* 2013). The potential conflict between law enforcement for conservation and demand for timber is imminent, since most houses are built with timber. On Príncipe, timber resources seem to be more abundant, although most resources are also found withing protected areas. Also, on this island the regional government has forbidden the sale of timber and charcoal to the main island of São Tomé, and local developers have been using timber imported from mainland Africa, to reduce the pressure on local forests.

Overfishing of Marine and Freshwater species

As coded on the IUCN Red List, fishing and harvesting aquatic resources are some of the main threats to marine species, especially sharks and rays (Figure 8.3). The main threats to freshwater fishes in the hotspot are overharvesting, as well as reduced water levels and pollution. Lake Volta, for example, has been the most important inland fishery in Ghana but overfishing, combined with reduced water levels and pollution, has led to the stagnation of the commercial fishery.

As described in Section 5.3.2, artisanal and industrial fisheries in the hotspot are poorly regulated, few catch data are recorded, and most fishing takes place relatively close to shore. Both artisanal and industrial fisheries target two main groups of resources: small and large pelagics; and demersal species. Small and large pelagics that are important fishery species include sardinellas, bonga, carangids, anchovy, scombrids and tunas. Important dermersal fish species, many of which occur in shallow, near-shore waters, include croakers, snappers and seabreams. Demersal fisheries also target shrimp, octopus and cephalopods. Sharks are also targeted in deeper water for their meat and fins. A study of shark fishing by West Africa Sub-Regional Fisheries Commission members (which include Sierra Leone and Guinea in the hotspot) showed that, after a rapid expansion in the 1990s, shark fisheries declined in the early 2000s, with a drop in landings (Diop and Dossa 2011).

Near-shore trawling and methods such as blast fishing and poison are very damaging to species and habitats, as are use of beach and purse seines to target spawning areas and juveniles in coastal habitats (Koranteng 2001). Industrial fishing in the hotspot is highly globalized, with foreign and national fleets operating throughout the hotspot region in numbers estimated as too high in relation to available biomass (IGCC 2006). Independent trawl surveys in the region have shown significant decreases in overall fish biomass over the past 10-15 years, which has been attributed to the increase in fishing activity of trawlers in inshore areas (IGCC 2006), as well as globalization of the fishing industry, including the dominance of Europe’s distant water fleets operating in the region (Atta-Mills *et al.* 2004).

8.1.2 Agriculture and Aquaculture

Agriculture and aquaculture were ranked through the workshops as the next most severe threat to biodiversity, after biological resource use. The identification of threats in the IUCN Red List analysis for the hotspot shows a similar pattern, with agriculture and aquaculture appearing as the second most significant threats to plants and vertebrates (see Figure 8.3). As noted in Section 5.3.2, West African countries currently account for only a small portion of global aquaculture production, though this has expanded substantially in recent years in Ghana and Nigeria. In addition to its potential for positive impacts, negative impacts of poorly planned and managed aquaculture can include conversion of coastal habitats, such as mangroves and tidal marshes, as well as pollution and introduction of invasive alien species. Given the relatively small role of aquaculture in the hotspot, the discussion of this threat category will focus on the threats posed by agricultural development, including commercial plantations.

Today in the hotspot, rural communities practice small-scale subsistence agriculture (growing crops like paddy and upland rice, cassava and maize with minimal fertilizer inputs and little to no irrigation), with smallholder cultivation of cash crops, such as cacao, in some areas. Terrestrial KBAs, for example within the Mount Cameroon and Bioko Montane Forests ecoregion, are threatened by the demand for new agricultural land by the expanding human population. The high diversity of aquatic and wetland plants of lower Niger River is also threatened by drought and habitat loss, due to expanding agriculture where wetland habitats are drained and converted to farmland; seven of the 200 species found here are assessed as globally threatened. There is a paucity of published data on wetland losses in Africa (Moser *et al.* 1996), and the production of wetland inventories and studies on the rate and extent of wetland loss are urgently required (Spiers 2001). Information exists for some areas of the hotspot. For example, Coleman *et al.* (2008) showed that, between 1987 and 2002, in an area of 1,110 km^2 of the lower Niger Delta, some 88 km^2 of wetlands had been converted to open water or agricultural usage.

Cash crops have a long history in the hotspot, especially as cacao in Ghana and Côte d'Ivoire. This crop was originally associated with unregulated and profitable logging, which fuelled forest fragmentation, degradation and further deforestation in these countries (see Chapter 5 and Appendix 6 for more information on cacao production in the hotspot). Such development patterns favored large-scale forestry and the granting of large timber concessions (Karsenty 2007). Clearance of land for other monocultures, particularly industrial tree crops such as palm oil, rubber and *Gmelina arborea*, is also threatening forests and biodiversity in the hotspot. Nigeria, Ghana, Cameroon and Côte d'Ivoire are among the largest producers of palm oil in Africa (see Table 5.7). Palm oil in the hotspot is produced through smallholder farming, as well as increasingly through large-scale plantations.

Development and expansion of oil palm plantations represents an increasing threat to the entire forest plant flora in those areas of the hotspot where forest is cleared (Mallon *et al.* 2015), including São Tomé island (Lopes 2012) and northwestern Cameroon (Hoyle and Levang 2012). The largest tract of remaining primary rainforest in Nigeria is centered on Cross River National Park: Oban Division (NGA4), which is especially rich in endemic plants and animals. These species are threatened by commercial plantations, among other threats (Borokini *et al.* 2014). Appendix 6 and Section 5.3.2 include details of specific companies involved in palm oil production in the hotspot.

8.1.3 Energy Production and Mining

This threat was ranked joint third by workshop participants as the third most severe to biodiversity in the hotspot, and includes several subcategories of threat: oil and gas extraction; fuelwood and charcoal production; and mining.

Oil and Gas Extraction

Poorly managed oil extraction in the hotspot has led to pollution and habitat destruction, with impacts on biodiversity, as well as socio-economic and political consequences. Oil is an important resource in the Niger Delta, impacting species in two freshwater KBAs: South East Niger Delta - near Calabar (fw10); and West Niger Delta (fw13). It has also been found in the Gulf of Guinea (around São Tomé, Príncipe and Bioko islands) and is inflicting huge impacts on coastal and marine ecosystems off the coast of Ghana.

A 2011 UNEP Environmental Assessment of Ogoniland in southern Nigeria found that, even without an active oil industry, oil contamination is widespread and severely affecting many components of the environment, washing into creeks, stressing and killing vegetation when it reaches the root zone, and contaminating soils (UNEP 2011). Two of the five freshwater KBAs in the Lower Guinean Forests subregion are situated within the Niger Delta and are heavily impacted by oil spills. More than 630 freshwater fish species have been assessed in the hotspot, of which around one-third are threatened. The highest densities of fish species in the hotspot are found within the Niger Delta and the Atlantic river catchments of Sierra Leone and Liberia, which are threatened by pollution and habitat loss resulting from oil exploitation. Most of the threatened molluscs in the hotspot occur in restricted areas, and rely on clean waters, making them susceptible to pollution. Pollution from activities connected with the oil industry also constitutes one of the main threats to both resident and migrant birds in the region (IGCC 2006).

As also discussed in Chapter 5, the oil and gas industry in the hotspot is also associated with socio-economic and political impacts that can translate into a challenging context for achieving conservation outcomes. In theory, oil and gas resources bring great wealth to the countries concerned but the history of oil extraction in Nigeria has shown that this does not usually translate into better livelihoods for all and better care for natural resources. More frequently, it precipitates a much greater gap between the rich and the poor, and encourages corruption and lawlessness rather than better governance, which is often referred to as the ‘resource curse’ in economic jargon. Civil unrest has been another legacy of the oil industry in Nigeria. In the case of the Gulf of Guinea, the socio-economic impacts on islands with tiny economies prior to the discovery have also been significant.

Fuelwood and Charcoal Production

Although not ranked separately in the analysis of IUCN Red List species in the hotspot or by workshop participants, fuelwood collection and charcoal production are among the greatest drivers of forest degradation in Africa (Kissinger *et al.* 2012; Rautner *et al.* 2013). Sub-Saharan Africa, with the exception of South Africa, has the largest proportion of its population relying on traditional biomass (an estimated 93 percent of households depend on wood energy for daily cooking needs), mainly fuelwood and charcoal, as well as the highest regional per capita wood energy consumption, an average of 0.69 m^3 in 2011, compared with a global average of 0.27 m^3 (IEA 2006, IEA 2010, Iiyama *et al.* 2014 cited in Cerutti *et al.* 2015). This consumption is also predicted to increase. In 2009, the number of people in Sub-Saharan Africa dependent on traditional biomass for cooking reached 653 million, and this is projected to reach 918 million in 2030 (UNDESA 2004, Arnold *et al.* 2006, cited in Cerutti *et al.* 2015). Charcoal consumption is often growing faster than fuelwood consumption, particularly in urban areas.

Throughout the hotspot, there exist high levels of dependence on fuelwood, including 95 percent and 85 percent of the populations in Benin and Sierra Leone respectively (UNEP 2008). Wood for fuel and charcoal has been shown to represent 31 percent of all wood harvested in Equatorial Guinea and 79 percent in Cameroon (de Wasseige*et al.* 2012). According to Oyedepo (2012), fuelwood is used by over 70 percent of rural Nigerians, and the country consumes over 50 million tonnes of fuel wood annually, a rate exceeding the potential for replenishment through various afforestation programs. Harvesting of fuelwood for domestic and commercial uses is associated with desertification in Nigeria's arid zones and erosion in its south (Oyedepo 2012). In Togo, fuelwood and charcoal account for more than 80 percent of national household energy consumption (Fontodji 2007, in Kouami *et al.* 2009), resulting in heavy pressure on the country's vegetation, particularly impacting the country's savannas and dry forests (Kouami *et al.* 2009). The thriving market for charcoal and fuelwood extracted from coastal mangrove forests in some of the hotspot countries is also of concern (see Section 5.3.2). Charcoal production is also sometimes a by-product of logging within the hotspot, where offcuts and sawdust may be made into charcoal and charcoal briquettes respectively.

Local community forest use, including for fuelwood and charcoal production, can be managed sustainably in areas where population density is low and forests are not degraded. Yet, across the hotspot, exploitation is increasingly being carried out for trade as well as for household consumption, and the cumulative impact of numerous small-scale producers can be very significant. Studies show that fuelwood is often sourced from areas being cleared for agriculture or close to urban markets and that demand for fuelwood is seldom the primary cause of forest conversion on a large scale (Arnold *et al.* 2003). Trees outside forests also appear to supply a large share of overall fuelwood demand in many countries in Africa, highlighting the importance of non-forest resources. Within the hotspot countries, land tenure (see Section 8.2.1) is still a major impediment to the creation of new on-farm forest resources for fuelwood and charcoal.

Mining

Many parts of the hotspot are rich in gold and other valuable minerals, and their exploitation (especially surface mining) can cause direct loss of forest and other habitats, particularly because geodiversity of minerals tends to occur in the same areas as biodiversity. In addition, impacts on communities can be substantial, as these areas also often coincide with good agricultural land (rich, fertile soils and forests). Liberia and Sierra Leone are particularly rich in diamonds, while Ghana is noted for its gold reserves (e.g. in Wassa Amenfi West district, including Mamiri Forest Reserve KBA (GHA17)). In addition to large-scale industrial gold mining in Ghana, small-scale illegal mining is common (see Section 5.3.2 for more detail on the mining sector, including specific mining companies). Exact locations are unknown but, geologically, much of the region has the potential to contain minerals and metals and is, therefore, potentially at risk from mining.

Yawri Bay KBA (SLE9) in southwest Sierra Leone has recently been described as being highly threatened by mining, along with from agricultural expansion and road construction (BirdLife International 2015). Nimba Mountains KBA (LBR12) has been identified as a transboundary AZE site for more than 20 years, and the mining of iron ore has been an issue of much controversy and contention between conservation groups and mining supporters (Mallon *et al.* 2015). The Mount Nimba Strict Nature Reserve at the centre of this AZE site is also a Biosphere

Reserve and World Heritage Site (in Danger) but has nevertheless been reduced by 1,500 hectares to facilitate iron ore extraction (Edwards *et al.* 2014).

8.1.4 Human Intrusions and Disturbance

This IUCN threat category includes the subcategories of: recreational activities (e.g. tourism in protected areas), war, civil unrest and military activities (e.g. military zones and exercises); and work and other activities. Although not a prominent threat according to the Red List analysis, it was ranked joint third by workshop participants. Two related threats identified by workshop participants from Nigeria include conflict and insecurity in the Delta and enclaves of refugees. These threats are closely linked to the drivers of particular threats to biodiversity in the hotspot, discussed in Section 8.2, including population movements and poor governance. More details on conflicts in the hotspot and their impacts are provided in Section 5.2.2.

8.1.5 Climate Change

Climate change and severe weather was ranked as the fifth most severe threat to conservation outcomes during the workshop process, equal with residential and commercial development. Although climate change across the hotspot is not expected to have impacts as extreme as in other parts of Africa, low-lying coastal areas are particularly vulnerable to sea level rise, with consequent threats to habitats and species. Along with projected temperature increases, greater unpredictability of rainfall and extreme events (droughts and floods), and varying predictions for impacts on and responses by species, habitats and ecosystems, human responses (adaptation and mitigation) to climate change may also result in additional pressures being placed on biodiversity and ecosystems. The detailed threats and impacts from related to climate change are reviewed in Chapter 9.

8.1.6 Agricultural Run-off, Poisoning and Industrial Pollution

Agricultural run-off, poisoning and industrial pollution are considered major threats to biodiversity in the hotspot. Pollution was ranked through the workshop process as the sixth most significant threat in the hotspot (Table 8.2). In contrast, it appears as the third most significant threat (to vertebrates and invertebrates in particular) in the IUCN Red List analysis (Figure 8.3). The Endangered Rüppell's vulture (*Gyps rueppellii*), hooded vulture (*Necrosyrtes monachus*) and Egyptian vulture (*Neophron percnopterus*), marginally present in the hotspot, have suffered from secondary poisoning from carburofan and other toxins inserted into animal carcasses to kill mammalian predators and changes in methods of carcass disposal (Mallon *et al.* 2015), which, together with other factors, have contributed to severe population declines. Water pollution is also a problem for many species, especially due to agricultural run-off and oil exploitation. Rubber plantations cause problems such as surface water pollution by chemical wastes and exposure of workers and local communities to toxic chemicals in Liberia and elsewhere (UNEP 2008; FAOSTAT 2015).

Although the oil industry has been singled out as a major polluter in the hotspot (see Section 8.1.3), improper domestic and industrial waste disposal is also a significant threat. Although there is a lack of recent studies, investigations in the past decade found that as wastewater treatment systems are often either absent or inadequate, pollution from residential and industrial sources is often directly discharged into freshwater and near-shore marine waters in the Gulf of Guinea, resulting in habitat degradation, loss of biological diversity and productivity, and degenerating human health (Ukwe *et al.* 2003). An estimated 3.8 million metric tonnes per year of solid waste was produced in the Gulf of Guinea coastal zone in 2002 (Scheren and Ibe 2002). Much of this ends up in the ocean, and solid waste on Gulf of Guinea beaches predominantly constitutes plastics (Scheren and Ibe 2002). Solid waste or debris sometimes constituted 69 percent of coastal trawl catches in Nigeria (Solarin *et al.* 2010). Cetaceans, sea turtles and marine fishes are at risk of physical entanglement with certain kinds of debris, including plastics and discarded fishing nets.

Sedimentation, linked to erosion and run-off from deforested and agricultural lands, also threatens biodiversity in the hotspot. Deforestation for agricultural expansion leads to increased levels of runoff and greater sediment loads in rivers and lake systems, with subsequent impacts on freshwater species and habitats. For example, the Critically Endangered river fish, *Barbus carcharhinoides*, restricted to the Upper reaches of St Paul River KBA (fw11) in Liberia, is suffering from an ongoing decline in habitat quality due to siltation and pollution from deforestation and mining. In the floodplain wetlands, where cattle raising and small-scale dry season agriculture are traditional practices, overgrazing is leading to soil erosion and, as a result of reduced vegetation cover, increased flooding (World Bank 2005). As another example, the main threats to Lake Barombi Mbo and surrounding catchments KBA (fw1) in Cameroon are the expansion of oil plantations and slash and burn agriculture in the surround catchments, leading to sedimentation and pollution of the lake.

8.1.7 Dams and Other Natural System Modifications

The majority of African countries rely upon dams to supply their electricity (hydropower) and to provide irrigation and water supplies. There are approximately 150 major dams (over 15 meters) in West Africa, with a number more proposed (UEMOA 2010) and most major rivers in West Africa have at least one or two large dams (around 50 percent for hydropower generation) creating ecological problems for many freshwater species. Although this density is relatively low compared to other parts of Africa, there is an ongoing decline in river flows (ECOWAS-SWAC/OECD 2008) and likely an increase in the construction of dams. The two largest dams in the hotspot are the Akosombo dam on the Volta River in Ghana, built in 1964, which stands 134 meters high (the fourth highest in Africa) and forms Lake Volta, the largest manmade lake in the world, with a surface area of nearly 8,500 km^2 (Nilsson 2009), and the Kossou dam on the Bandama River in Côte d'Ivoire (the sixth largest in Africa).

The majority of these dams were designed in a top-down manner, without taking into account the wider impacts of such developments, which should be considered at the basin scale. Given the transboundary nature of some of the rivers proposed to be dammed, the risks of international disagreement and tension are real, such that the development of river basin organisations and joint observation systems to address and monitor both the environmental and political impacts of such developments are essential (ECOWAS-SWAC/OECD 2008). Critical riverine habitats, such as rapids and pools, are converted into lacustrine habitats often unsuitable for former residents of the river that has been dammed. Fish migrations are physically impacted and the river discharge and siltation patterns, which are used by many species as a cue for important behaviours, are altered (e.g. in the Western Equatorial Crator lakes, where dams hinder fish migration upstream for breeding). Curtailment of flood regimes may prevent or reduce the seasonal inundation of floodplains, thus interrupting lateral fish migrations and the availability of feeding, breeding, and nursery grounds. In the case of mollusks, most threatened species occur in restricted areas where they rely on clean rapidly flowing waters, making them susceptible to pollution and the impact of dams. Agriculture is also affected, as the suppression of flooding and the associated deposition of sediment reduces floodplain fertility for pastoral grazing and agriculture. The Akosombo dam has not only impacted downstream fisheries along the Volta River but also, due to the decreased levels of sediment load, led to erosion of the coastlines of Togo and Benin at a rate of 10 to 15 meters per year (World Commission on Dams 2000).

The ECOWAS Permanent Forum for the Coordination and Monitoring of the Integrated Management of Water Resources in West Africa could play a pivotal role in the promotion of better governance of water resources in the region, along with other regional organisations. However, with growing demands for electricity from hydropower, the number of dams is likely to increase throughout the region. Hydropower projects under development include the Mambilla Plateau dam in Nigeria, which is being supported by a USD 1 billion loan from China; as one of the largest dam projects in Africa (around 3000 MW installed capacity), it would double the country's electricity supply (International Rivers 2015; This Day Live 2013).

8.1.8 Economic Corridors and Infrastructure

The IUCN threat category of 'transportation and service corridors' was ranked fourth as a threat to biodiversity in the hotspot by the workshop participants, yet was ranked low in the IUCN Red List analysis. This may be due to its status as an emerging threat, as transportation and other infrastructure is improved in the region. Further investigation of the impacts on conservation outcomes is needed, as road development may have positive effects on rural poverty (e.g. through better market access) as well as negative impacts on species and habitats (e.g. by fragmenting and opening up forest areas to encroachment). Within 10-15 km of roads and settlements, large and medium bodied mammals experience sharp declines in population (Laurance *et al.* 2006).

ECOWAS plays an important role in the coordination and development of infrastructure programmes in West Africa. It leads NEPAD's programs in West Africa, including the Comprehensive African Agriculture Development Program (CAADP) and the Program for Infrastructure Development in Africa (PIDA) (AfDB 2011). The PIDA priority action plan contains 51 programmes and projects designed to address priority infrastructure deficits in energy, transport, information and communication technology, and transboundary water up to 2040 (PIDA 2015). Other key players in financing and coordinating infrastructure development include the African Development Bank (AfDB), the World Bank, the EU, China and India (see Section 5.3.1 for discussion of investment trends in infrastructure and other sectors). A recent survey of investors in the region indicates that the region is considered an attractive investment destination, with strong economic growth rates, abundant natural resources and a growing population, but a 'chronic infrastructure deficit'; among those surveyed, more than half expect to increase their spending on infrastructure in the future (PwC 2014).

Transportation infrastructure is likely to account for a substantial portion of these investments. In 2011, the AfDB considered West Africa to have the lowest quality of transport services in the world, as measured by the Logistics Performance Index. This is due to poor quality roads, as well as an outdated network based on the colonial era trade links (i.e. north-south, as opposed to east-west; AfDB 2011). Priorities for improving transport infrastructure include developing the 17 railway links identified in the ECOWAS Railway Master Plan, two of which (B2: Kaya–Dori–Niamey; and B1, Bamako–Bougouni–Ouangolodougou) are undergoing detailed design with support from the EU and other donors (AfDB, 2011). Priority road corridors include completing missing links in the TransCoastal (4,900 km) and Trans-Sahelian (5,400 km) highways (AfDB 2011).

8.1.9 Residential and Commercial Development

As shown in Table 8.2, residential and commercial development was ranked as the fifth most significant threat to conservation outcomes during the workshops. There was considerable variation among the country groups with regard to their views on this threat, with participants from Equatorial Guinea, Ghana and Nigeria ranking it as severe, while those from São Tomé and Príncipe, Togo, Cameroon and Côte d'Ivoire considering it minor. The subcomponents of this threat category examined here include urbanization (which can also be classified as a driver) and coastal development.

As discussed in Section 5.2.2, almost all countries in the hotspot have experienced increases in the percentage of their populations classified as urban between 2000 and 2012, and these trends are projected to continue in the future. West African urbanization trends tell a complicated story, however. The region has one of the fastest urban growth rates, yet with only 31 percent of its inhabitants living in agglomerations of more than 10,000 inhabitants, it remains one of the least urbanized regions (AFD 2009). Urbanization is occurring through the growth of small urban centers, as well as the expansion of existing large cities. Countries projected to experience particularly large shifts to urban populations by 2020 include Liberia (from 36.5 percent in 2000 to 53.5 percent in 2020) and Ghana (from 39.1 percent in 2000 to 48.4 percent in 2020). AFD (2009) also projects the formation by 2020 of an urban band of high density in the coastal area of the Gulf of Guinea. Residential and commercial development, driven predominantly by population growth and rural-to-urban migration, is placing increasing pressure on environmental resources within the hotspot. One KBA threatened by residential and urban development is Lofa-Mano Complex (LBR11) in Liberia.

Countries within the hotspot, particularly Ghana, Cameroon and Liberia, experience large southward movement of populations of young men due to greater economic opportunities there. Accounting for net immigration to coastal countries in western Africa, the total urban population of the coastal zone was expected to double between 2000 and 2020 and to double again between 2020 and 2050 (UEMOA 2010). The impacts in terms of land use are through horizontal spread of built-up areas, spread of development along coastal roads, and increased environmental pressures of food production in coastal landscapes such as through rice farming, salt production, and increased fishing effort (UEMOA 2010). Urbanization is one of the contributing factors to loss of large areas of mangrove forests within the hotspot, primarily off the coasts of Nigeria and Cameroon.

Although the coastline is subject to natural erosion and sedimentation processes due to high wave energy and strong littoral transport in the region, these phenomena are intensified by human activities associated with residential and commercial development, such as sand/gravel mining along the coast, damming of rivers, port and jetty construction, dredging, and mangrove removal. Harbor and jetty construction are responsible for erosion rates of 15-25 meters per year in Nigeria, Benin, Togo, Ghana and Côte d'Ivoire, due to alteration of long-shore sediment transport and dredging (IGCC 2010, IGCC 2006). This can impact biodiversity by damaging important habitat, such as mangroves, estuaries, sand dunes and seagrass beds, and may reduce opportunities for more sustainable development options. If the development of coastal tourism in the hotspot is to move forwards successfully, it is recommended that lessons be learned from the experiences of coastal development in North and Northwest Africa, where coastal erosion is reported to have devastating effects, with many communities no longer able to live close to the sea (UNESCO 2012).

Large industrial developments, such as the Punta Europa gas and hydrocarbon facility on Bioko in Equatorial Guinea can also lead to direct impacts on ecosystems and people through coastal erosion, pollution, domestic and industrial sewage and effluent, solid wastes (much of it plastics) and loss and degradation of key resources such as mangroves. Coastal development also affects all four of the marine turtle species present within the hotspot, which suffer from loss of nesting beaches, especially the Critically Endangered hawksbill turtle, which nests on Bioko Island and São Tomé and Príncipe. Timber lost at sea by logging companies washes up onshore and obstructs nesting beaches in Equatorial Guinea and Cameroon. Coastal erosion due to sand mining, harbour building and irregular current flows has compromised the suitability of long stretches of coastal areas as nesting sites, particularly between Ghana and Nigeria. There are also social and economic impacts of commercial coastal developments, as public access to beaches is also becoming increasingly restricted and is especially unpopular with fisher folk.

8.1.10 Invasive and Other Problematic Species, Genes and Diseases

Invasive species, genes and diseases were ranked through the consultation workshops as the joint ninth most significant threat in the hotspot, only followed by geological events, which was universally considered to be either minor or not relevant. Although ranked lowly, this threat has impacts on several key habitats and species, mainly through the subcategories of invasive, non-native species and diseases, and problematic native species and diseases.

Diseases, such as Ebola and Simian Immunodeficiency Virus (SIV) and respiratory illnesses transmitted from humans, have been confirmed as important threats wild gorillas and chimpanzees, with outbreaks of the Zaire strain of Ebola in Gabon and Congo estimated to have killed approximately one third of the world's gorillas and a slightly smaller proportion of its chimpanzees in the past 20 years (Ryan and Walsh 2011). For example, western gorilla, found within the hotspot in Cameroon and Nigeria, is Critically Endangered due to a combination of exceptionally high levels of hunting and disease-induced mortality from Ebola: over 90 percent in some large remote areas, according to the IUCN Red List, though mainly outside of the hotspot (e.g. in Gabon and Congo). The Cross River subspecies of western gorilla, occurring only in a small area on the Nigeria-Cameroon border, is mainly threatened by its small population size and habitat loss; Ebola has not been reported in this population but may become a threat in the future.

Chimpanzee, with subpopulations across much of the hotspot, including in KBAs such as Gola Forest Reserve (SLE1) and Sapo National Park (LBR14), is Endangered due to high levels of hunting and loss of habitat, as well as Ebola. Although the wildlife reservoir for Ebola is not yet confirmed, the recent outbreak in West Africa has been linked to a zoonotic transmission from Angolan free-tailed bat (*Mops condylurus*) in Guinea; larger wildlife (including chimpanzees) in this location were apparently not affected by Ebola (Saéz *et al.* 2015). The Conservation Action Plan for the Nigeria-Cameroon chimpanzee subspecies notes that, although outbreaks of Ebola have not been found in Nigeria-Cameroon chimpanzee populations, they do harbour anthrax and multiple strains of malaria, hence field research and coordination with the Global Viral Forecasting Initiative should be encouraged (Morgan *et al.* 2011).

With regard to invasive species, infestation of water hyacinth, native to South America and originally introduced on account of its wide appeal for introduction to water gardens across Africa, is a critical problem for the health of many systems in the hotspot, including Lake Volta in Ghana. Water hyacinth management was, until recently, costing Nigeria USD 639 per hectare per year in mechanical control, and USD 161 per hectare per year in chemical control (Boy and Witt, 2013). Experience from other areas, specifically Lake Victoria, suggests that, if rapid action is not taken to address the problem, there will be serious economic, health, and environmental consequences. Weed infestation impedes transportation, damages equipment used for fishing (boats, nets, tackles, etc.), irrigation and water supply (pumps and other water extraction machinery), and potentially impacts operation of hydroelectric plants with huge associated costs. Weeds also multiply rates of evapo-transpiration by several times, and provide habitats for disease vectors. Extensive lake surface cover by plants such as water hyacinth can also reduce light penetration and oxygen levels, as the detritus of plant leaves accumulates; this can have a significant impact on associated fish, plant and invertebrate communities.

WorldFish Center is working with partners to introduce the Genetically Improved Farmed Tilapia (GIFT), a genetically improved strain of Nile tilapia (*Oreochromis niloticus*), to help small and medium-sized farmers overcome poverty and hunger in Ghana and other countries in the Volta Basin, such as potentially within the Lower Volta eastern catchment KBA (fw5), through improved aquaculture production. These fast-growing fish are already benefiting many rural communities. However, the GIFT tilapia also poses a potential threat to other freshwater species if it escapes from the experimental farms. The impacts of such escapes are still hotly debated and need to be determined through additional research before irreversible mistakes are made.

Being an island nation, introduced species on São Tomé and Príncipe are likely having negative ecological impacts, although this has been systematically overlooked in recent studies (R. Lima pers. comm.). Although the islands' only native mammals are shrews and bats, they now support populations of introduced monkeys, pigs, civet, rats and weasels. There are also exotic fish, birds and invertebrates, such as the highly invasive African giant land snail. During colonial times, numerous plant species were introduced, many of which are nowadays behaving invasively. Some examples include bamboo, oil palm, coconut, quinine, cinnamom, avocado, African breadfruit and African nutmeg. The impact of these exotic species in the native ecosystems is not known, mainly due to a lack of research on the topic, though it is a reasonable assumption that so many exotic species on such small islands are likely to be having negative impacts of some kind on the native species.

The globally devastating amphibian chytrid fungus *Batrachochytrium dendrobatidis*, which has a patchy distribution across Africa, has been recorded in Lower Guinean Forests subregion of the hotspot (Olsen *et al.* 2013) but appears not to have reached the Upper Guinean Forests subregion, possibly due to the Dahomey Gap, which is an arid region that may represent a barrier to its spread (Penner *et al.* 2013). The Upper Guinean Forests subregion may now be the last tropical region, apart from Madagascar, where chytrid does not exist.

8.2 Drivers and Root Causes

The following section explores the underlying causes, or drivers, of the main threats to biodiversity in the hotspot. The main generic root causes acting to generate the identified threats described in Section 8.1 are analysed in Table 8.3, and a number of these are then examined in greater detail. It is important to note that, for most threats, there is no single identifiable root cause at the scale of the hotspot. A more detailed examination of legal, political and socio-economic drivers and actors is needed in relation to a specific location or issue, in order to understand the complexities of the local situation and to derive acceptable and workable conservation solutions.

With respect to land use change resulting in deforestation, for example, it is impossible to discern any single root cause at the scale of the hotspot, given that each country is different politically, economically, and culturally (Geist and Lambin 2002). Ghana's Approved REDD Readiness Preparation Proposal states that "By and large, the problem is one of gradual 'degradation' rather than 'deforestation', and is incremental rather than dramatic, with no single dominant driver" (Bamfo 2010). The immediate drivers (and associated barriers) include forest industry over-capacity, policy/market failures in the timber sector, population growth, increasing local demand for agricultural and wood products, high demand for wood and forest products on the international market, heavy dependence on charcoal and fuelwood for rural and urban energy, limited technology development in farming systems, and continued reliance on cyclical 'slash and burn' methods to maintain soil fertility. Drivers would therefore need to be described on a case by case basis (and the same applies to root causes and drivers underlying other threats).

Table 8.3 Root Causes Underlying Threats to Biodiversity in the Guinean Forests Hotspot

Root Cause	Description
Poverty and wealth inequality	Most countries in the hotspot are poor and poverty levels are highest in rural areas where communities are most dependent on direct exploitation of natural resources for their survival and livelihoods. Although there is rapid economic growth and a developing middle class in several hotspot countries, the poverty gap is widening across Sub-Saharan Africa (the rich become richer and the poor, poorer). Poverty and inequality, coupled with lack of alternative options, drive communities to use unsustainable practices of resource exploitation, which threaten sites, species and ecosystem integrity.

Root Cause	Description
Population pressure (population growth, densities, movements and demographic change)	National populations across the hotspot are growing, with an increasing proportion living in urban centres in all countries. Patterns of population growth and movement vary greatly between and within countries. In rural areas, increasing populations and inward migration can result in greatly increased demand for land, water and resources. This can, in turn, drive unsustainable resource exploitation practices, conflict over land and resources and direct threats to species, sites and corridors (including protected areas). The most fertile and productive areas of land and water (which may also be key areas for biodiversity and ecosystem services conservation) are often those under greatest pressure for unsustainable development.
Outdated/inequitable systems of land and resource tenure	The outdated and inequitable tenure arrangements that are found in many countries in the hotspot are helping to drive non-biodiversity friendly land use practices and blocking the transition to better forest and agricultural land-use. Land tenure and access systems that favor elites and exclude local communities from involvement in management or access to resources can inhibit efforts to achieve long-term, sustainable conservation and development solutions. Community involvement in co-management of protected areas or conservation management and sustainable use in buffer zones can be very effective but is often not supported by policy, legislation and governance at national and local levels.
Socio-economic trends, development models and fiscal pressures	Changes in society and development patterns can bring new pressures on species and habitats, e.g. increasing wealth, health, and education can result in greater attention to conservation but can also lead to greater demands for resources. New technologies and means of communication change how people manage and exploit natural resources and conduct business and trade. Conflict can displace large numbers of people, exploiting resources for survival and losing attachment to the land and land management systems. Global, regional and national development and economic policies and influences may have unforeseen negative impacts. Trade patterns, land ownership and management are undergoing major changes in the hotspot countries as a result of new international economic and development influences. Perverse incentives can drive unsustainable practices (e.g. the promotion of biofuels at the expense of other land uses). Global recession, changes in international trade and competition, changes in commodity prices, can also drive unpredicted amd often negative impacts.

8.2.1 Outdated/Inequitable Land Tenure Arrangements

The outdated and inequitable tenure arrangements for land and natural resources that are found in many countries in the hotspot are contributing to non-biodiversity friendly land use practices and blocking the transition to better forest and agricultural land-use. As outlined in Chapter 5 (section 5.1), land tenure in the hotspot countries is often a mix of customary and statutory land rights, resulting in discrepancies and conflict as the two systems are implemented. In addition, it is a feature of all the Francophone West African countries in the hotspot and of some of the Anglophone ones (notably Ghana) that tree tenure and land tenure are separated. The result is that agricultural land may belong to one person and the indigenous trees on it to another. This situation dates from an earlier era when crops belonged to the grower but the trees belonged to the state or to the land-owner who rented the land to the grower. This situation has caused major problems in the cacao belt in Ghana. Cacao is a crop that grows well under forest shade and a cacao landscape could also be a forest landscape. However, cacao farmers have grown so tired of contractors felling trees, destroying cacao trees and offering poor compensation, that they often destroy volunteer forest tree seedlings as they appear, to avoid trouble in the future.

The tenure split between land and trees has at least three important negative implications for biodiversity. First, it destroys what would otherwise be a land-use protective of biodiversity. Second, it forces farmers who need timber to seek it, sometimes illegally, from forest reserves and protected areas instead of using what they have on their own land. Third, compared with parts of Africa where trees on farms are clearly the property of the owner, farmers are discouraged from planting trees for their own timber, fuelwood and nutritional use, and from selling trees: an obvious way forward to increase forest cover is blocked (Shepherd and Kofi Nyame 2009). As a result, timber mills are still geared only for large forest trees, and the processing of smaller diameter trees from farms, e.g. agroforestry, hardly exists.

8.2.2 Socio-economic Trends, Development Models and Fiscal Pressures

Global, regional and national development and economic and fiscal policies and influences may have unforeseen negative impacts on biodiversity and ecosystems and inhibit sustainable development, largely through their role in driving land-use change. Changes in society and development patterns can bring new pressures on species and habitats. For example, increasing wealth, health and education levels can result in greater investment in conservation, but they can also lead to greater demands for resource exploitation (e.g. land development for new housing; roads, access and infrastructure for recreation and tourism). As the population of hotspot countries is projected to increase by 1.5 times by 2030 (see Chapter 5), these increased pressures are likely. Recent surveys of investors in the region indicate that there is an expected 25 percent increase in spending on infrastructure (PwC 2014), with potential impacts on habitat fragmentation. New technologies and means of communication also change the ways in which people manage and exploit land, water and natural resources and conduct business and trade. Wars and conflict can result in large numbers of people being displaced and reliant on natural resources for survival, as well as losing previous attachments to landscapes and land management systems that may previously have functioned sustainably.

Trade patterns, land ownership and natural resource management are undergoing major changes in the hotspot countries as a result of new international economic and development influences, notably from China and other investors in the hotspot and increasing "south-south" trade relationships. Agreements between hotspot countries and China such as 'infrastructure for oil' have the potential to create 'lose-lose' situations for biodiversity, due to potential incursion of infrastructure into biodiverse areas and indirect effects from increased oil consumption and climate change. Perverse incentives or other financial arrangements can drive unsustainable practices (e.g. tax breaks and incentives for the promotion of biofuels at the expense of other land uses that are more ecologically and socially sustainable and equitable, such as the maintenance of biodiverse and carbon-rich forests or the production of food crops). Global recessions, changes in international trade and competition, and volatile commodity prices can also drive unpredicted negative impacts on species and sites.

A variety of imminent and already extant initiatives in the region have implications for forests. This includes growing pressure for the direct conversion of forest land to other uses, as well as the effects of land alienation on small-scale farmers, which will likely lead to increased pressure on remaining forests. For example, increased profitability and access to investment is changing the patterns of palm oil production (a traditional smallholder crop, e.g. see GRAIN 2014) in the hotspot, and encouraging the development of large-scale industrial plantations. Recent moratoriums on deforestation and land shortages in Southeast Asia have also been linked to the increased targeting of the African tropical forest zone by multinational companies for palm oil (e.g. Feintrenie 2012 in Linder 2013). Many of the hotspot countries have recently committed (at a meeting in Côte d'Ivoire in 2013) to oil palm expansion for development. In Ghana, significant growth in cacao production is also expected as the government is committed to supplying free inputs and improving infrastructure for farmers in this sector (PwC 2014).

The large land leases that have displaced small-scale farmers in Northeast and East Africa may not yet be an important feature of the hotspot countries but other change is on its way. In February 2014, the G8 (through its New Alliance for Food Security and Nutrition) declared its interest in "boosting agriculture and relieving poverty" by inviting big business to create large commercial farms in many parts of Africa, including West Africa (The Guardian 2014). Many of the proposed crops, the article notes, are actually cash crops for export, such as cotton and palm oil but they will not be grown through smallholders as is the case with cacao. It is likely that many of the displaced smallholders will be forced into remaining forest areas in search of land.

8.2.3 Poverty and Wealth Inequality

The gap between rich and poor across the hotspot countries is widening (see Section 5.2.3 and Table 8.4). Highly unequal income distribution generates, among its side effects, low trust of those in authority, deep poverty that becomes harder to alleviate as the income gap between rich and poor widens, and consequent indifference among the wealthy to the situation of the poor. However, even if rural people should feel marginalised, local level rules and norms may still be in place in many areas for relatively equitable and sustainable sharing of natural resources. It is the inability of poor rural people to hold outsiders to account that causes many problems at site and ecosystem level.

Countries with the highest perceptions of corruption are Equatorial Guinea, Guinea, Nigeria and Cameroon (Table 8.4). Corruption and tolerance of extreme inequality and injustice make it difficult to achieve effective and equitable conservation solutions. For example, the conversion of natural ecosystems to agriculture and residential areas, as well as the development of large infrastructure projects, is more likely to be driven by large commercial interests and facilitated by corruption, than the result of the actions of the rural poor.

Table 8.4 Gini Index and Corruption Perception Index Rankings for the Hotspot Countries

Country	Gini Coefficient Ranking[1] (and Year)	Transparency International Corruption Perception Index (ranking out of 177 countries scored[2])
Benin	no data.	94
Cameroon	38.9 (2007)	144
Côte d'Ivoire	41.5 (2008)	136
Equatorial Guinea	no data	163
Ghana	42.8 (2006)	63
Guinea	39.4 (2006)	150
Liberia	39.4 (2007)	83
Nigeria	48.8 (2010)	144
São Tomé and Príncipe	no data	no data
Sierra Leone	35.4 (2011)	119
Togo	39.3 (2011)	123

Source: Transparency International.
1 = The Gini Coefficient measures the extent to which the distribution of income or consumption expenditure among individuals/ households within an economy deviates from equal distribution: the size of the gap between the richest and the poorest. An index of 0 would mean perfect equality and 100 perfect inequality: so the higher the number, the wider the gap between rich and poor. Data come from different years, but where the World Bank has data for more than one year for one of these countries, the trend is always upwards towards greater inequality. Data are from the most recent year available. Highly unequal distribution generates, among its side effects, low trust of those in authority, deep poverty that becomes harder and harder to alleviate the wider the income gap between rich and poor grows, and indifference among the wealthy to the situation of the poor.
2 = Transparency International Corruption Perception Index measures levels of corruption as perceived by a range of stakeholders in the countries ranked. There is almost by definition no way of measuring actual corruption. However, this index is a proxy indicator for the quality of governance in a country. The higher the number, the poorer the governance.

8.2.4 Population Pressure and Southerly Migration

Both urban and rural populations in parts of the hotspot are still increasing, placing pressure on land and natural resources, especially where in-migration is adding to these trends. However, the urban-rural split for countries in the hotspot is lower than the African average (see Chapter 5 for a more detailed discussion of demographic and socio-economic factors in the hotspot). Although urbanisation rates are increasing, much of Africa still has 70 percent of its population in rural areas because there has been too little investment in urban employment opportunities. The activities of this rural population are associated with a number of the main drivers of threats to biodiversity in the hotspot, such as the expansion of agriculture and bushmeat consumption. Although many rural areas still suffer from rapidly increasing populations and associated pressures on natural resources, overall African population growth rates have begun to decrease. This may constitute the very early signs of a transition that will eventually benefit conservation and more sustainable development in rural areas.

At the regional scale, a significant proportion of the population is also moving southwards, with impacts on the habitats and species of the hotspot. Drought and climate change (discussed in Chapter 9) and political instability in countries outside of the hotspot, such as Mali, have forced many former pastoralists to settle further south in countries such as Burkina Faso and Niger where agriculture is possible. In turn, the descendants of the farmers who settled in these areas, understanding that there will likely be no land and very limited future livelihood options, have migrated in huge numbers southward into those countries along the West and Central African coast, particularly Ghana, Cameroon and Liberia. Some find urban employment and no doubt others settle in rural areas, initially as employees of wealthier farmers. The implications of this migration for biodiversity conservation is yet to be considered in any meaningful way but it is likely to mean that urban and rural populations in parts of the hotspot continue to increase rapidly, while natural population growth rates decline, with concomitant increases in pressure on land and natural resources.

Movements of refugees and resulting increased population densities in new areas also lead to increased pressures on natural resources and environmental degradation. In 2002, several hundred thousand of refugees from conflicts in Sierra Leone and Liberia were displaced to Guinea (with local population densities already as high as 400 per km^2). Many of these were in the colloquially named 'Parrot's Beak' region of Guinea: the small area of land jutting southward into Sierra Leone between the Meli and Mokona Rivers (within the hotspot boundary), where there is clear evidence of environmental degradation and loss of forest cover on satellite images taken before and after the influx of refugees. Many people settled semi-permanently in the area, which was transformed from a mosaic of forest, villages and agricultural plots to bare ground with almost no forest remaining (UNEP 2008). Paradoxically, forest regenerates rapidly in areas vacated by refugees if then left unfarmed and unoccupied. This phenomenon has occurred in northern Uganda where armed conflict inadvertently enabled much forest regrowth (Shepherd *et al.* 2013). Such regeneration may also have occurred in conflict-affected areas of the hotspot, although further study is required.

Displacement of people across borders and internally is likely to continue to feature as a driver of environmental change in the hotspot. In Nigeria alone, the National Commission for Refugees reported 3.3 million internally displaced persons in the country as of December 2013 (IDMC 2014). The Internal Displacement Monitoring Center (IDMC) lists the causes of displacement in Nigeria as: inter-communal conflict between Christians and Muslims in the Middle Belt of the country; other religious, sectarian and electoral violence; Boko Haram attacks, and government responses, in northeastern Nigeria; forced evictions, e.g. from city slums; recurrent floods in lowlands and coastal zones; and desertification in the north. UNHCR (2015) also notes that there are more than 14,000 refugees, mainly Ivorians and Togolese, in Ghana.

8.3 Barriers to Action

Barriers to conservation action refer to policy, socio-economic, financial and other factors that form obstacles to or diminish the impact of conservation efforts, current and potential. The key barriers identified in the hotspot are outlined in Table 8.5. As mentioned above, these barriers are closely linked to the drivers of threats to biodiversity. For example, land tenure arrangements drive practices that are harmful to biodiversity, and these inequitable arrangements also create a barrier to certain reforms. The following sections discuss three key barriers in greater detail: legislative and policy weaknesses; poor governance; and lack of awareness and education.

Table 8.5 Barriers to the Attainment of Conservation Outcomes in the Guinean Forests Hotspot

Barrier	Description
Weak policies and legislation (and/ or enforcement of regulations) for the protection of biodiversity and ecosystems, and wider policy context (land use, production sectors, development etc.)	Legal barriers to achievement of conservation outcomes include weak legislation and/or regulation at the national level (for the protection of biodiversity and ecosystems, including protected areas). Where legislation is sufficient, it may not be enforced adequately (e.g. trade in endangered species; fisheries regulations for sustainable use). Specific barriers can be identified at the national level and in relation to specific conservation issues (species, sites, corridors) as the basis for legislative reform or strengthened regulation and management. At national and regional levels, policy development is often very slow and policies are poorly integrated or conflicting, unable to provide supportive framework for conservation. Development and other sectoral policies often take no account of the needs of biodiversity and do not provide a supportive policy context for sustainable management of key biodiversity and ecosystems. Sectoral policies do not include the real values of biodiversity and ecosystems in underpinning development and livelihoods nor the need for ecosystem approaches to management. They frequently exclude or inhibit local community involvement in land use planning and management.
Weak governance (environmental and other): grassroots to regional levels	Weak governance, both of environmental/natural resources and in other sectors (such as broader land use planning and development), can lead to direct negative impacts on species and ecosystems (e.g. destruction or loss of habitat for other land uses, over-exploitation or over-development, and pollution). Weak governance (in policy development, legislation, regulation, and implementation) occurs at local, national and regional levels. One example is that local communities and civil society may be excluded from decision-making at various levels and the overall impact is frequently the destruction or reduction in biodiversity and ecosystem services (the natural resource base on which most rural communities and their livelihoods depend).
Lack of education and awareness, and understanding and recognition of the real values of biodiversity and ecosystems	Attitudes to and awareness of natural resource management values and issues are key factors in the success or failure of efforts to achieve conservation and sustainable management. If biodiversity and ecosystem services are not understood and/ or are under-valued, individuals and institutions are more likely to make decisions based on short-term gains and exploitation, rather than a longer-term conservation and sustainable development perspective. Education levels are also a very significant factor in poverty and development. Education (especially of girls) generally slows population growth rates, gives communities greater influence on policy and decision-making and access to more livelihood and income-generating options. The crucial importance of sustainable management of biodiversity and ecosystems for livelihoods opportunities and development, especially among the rural poor, is often ignored or overlooked.
Lack of access to alternatives (e.g. more sustainable land and resource use practices, new forms of income-generation, new technologies)	At the grassroot levels, in particular, communities are often constrained or driven to carry out unsustainable practices of land use or natural resource exploitation by a lack of alternative options. This can be the result of a variety of factors or other barriers (specific to the community or location) – inability of communities to access ideas, technologies or funding support to initiate alternatives; policy, legislative or resource access barriers etc. energy.
Lack of knowledge and ideas/ lack of access to networks for ideas exchange	Rural communities in particular may lack access to new ideas and technologies which can support more sustainable practices and to opportunities to learn from experience elsewhere (nationally and regionally). Community consultations and project evaluations consistently report that networking, exchange visits (seeing what others are doing successfully), exchange of ideas and expertise are some of the most effective ways of learning and achieving positive change.

Barrier	Description
Lack of capacity for effective conservation and sustainable management	A lack of capacity at all levels of government and civil society often inhibits effective conservation action. It can be a barrier at individual, community and institutional levels. Components include lack of political will; lack of skills, expertise and adequately trained individuals; lack of organizational capacity or management systems; lack of staff and materials/ equipment etc.; poor governance and lack of accountability. Many individual protected areas and national protected area systems in the hotspot lack the required capacity to manage and conserve biodiversity and ecosystems inside protected areas effectively. Outside protected areas, the capacity for integrating civil society and government approaches and achieving effective conservation management of key biodiversity and ecosystems is very low in most countries.

8.3.1 Legislative and Policy Weaknesses

Probably the largest single barrier to the achievement of good conservation outcomes in the hotspot is the development and implementation conservation policy and legislation. At national and regional levels, policy development is often very slow (e.g. Liberia's Forest Code of 1965 has been under review since 2002), and policies are poorly integrated or conflicting, unable to provide supportive framework for conservation.

As shown in Section 6.2, all hotspot countries have ratified the major multilateral environmental agreements, and most have a legal framework for protected areas and forestry. Indeed, in many African countries, forest policy has been updated in the years since the United Nations Earth Summit in 1992. Some environmental laws in the hotspot date back to the colonial era, yet reforms have been ongoing, with the forest sector in the lead. For example, Benin introduced a new forest policy in 2011, while Nigeria is currently considering a new forest policy. Forest policies in Africa now accord a far larger role and set of responsibilities to local people than colonial forest policies did. Much experience has been gained on how to work effectively with communities and other non-government actors as forest managers as a result, though there is a way to go. Aspects of conservation policy in the hotspot, however, lag far behind in this process. No hotspot country has legislation on species conservation, and only two have laws related to community based conservation (Cameroon and Ghana), though this does represent a degree of progress. Forest policy reform may offer a model for conservation policy reform; this experience has shown that as forest policy updates have been driven by new and better field experience on the ground. In the medium term, conservation policy barriers may be best addressed in a similar way: from the bottom up, building a greater role for community-based natural resource management.

Gaps and weaknesses in policies and legislation in other sectors can also have crucial implications for conservation outcomes. For example, as noted in Section 6.3.5, only four hotspot countries have land-use planning legislation. Development and other sectoral policies often take no account of the needs of biodiversity and do not provide a supportive policy context for sustainable management of key biodiversity and ecosystems. For instance, policies and targets for socio-economic development can frame conservation as a cost that cannot be met until development levels are higher. In addition, although all countries in the hotspot have requirements for environmental impact assessments (EIAs), it is unknown whether these requirements are consistently applied, whether assessments meet quality standards or whether their recommendations are implemented. Poor EIA standards, combined with poor definitions of 'degraded' or 'secondary' forest, can encourage the allocation of forest areas for conversion to agriculture, as was allegedly the case for an oil palm concession in southwestern Cameroon (Linder 2013).

Further, sectoral policies (e.g. land use, production sectors such as fisheries and agriculture, protected areas) do not include an understanding or assessment of the real values of biodiversity and ecosystem services in underpinning development and livelihoods, nor the need for ecosystem approaches to management. They also frequently exclude or inhibit local community involvement in land use planning and management. WRI's Environmental Democracy Index (a measure of national-level laws to protect environmental democracy) includes a measure of participation. Of the hotspot countries included in the 2015 provisional rankings, all score below average on participation: Benin ranks 55 out of 70 countries, while Ghana ranks 51 and Nigeria 38.

8.3.2 Weak Governance

Weak governance underlies many of the root causes of threats to species and ecosystems across the hotspot and creates a barrier to efforts to address the drivers of these threats. For example, rural poverty is often a product of weak governance through such factors as: lack of provision for effective education and thereby a potential exit from poverty; lack of access to markets and other essential services, such as healthcare; and absence of savings and loans schemes for the poor. Such services and enabling conditions can play an important role in supporting poverty alleviation. For example, a recent study by FAO and IFAD on rebuilding West Africa's food production potential notes that "inclusive value chains" are essential in improving the livelihoods of the rural poor, that markets should be more inclusive of small-scale producers, including women, and that constraints faced by women in accessing resources (land, credit, technology, training, extension) should be broken down (Elbehri 2013).

Weak governance also plays a part in driving badly managed or short-sighted development programs and schemes that often lead to environmental impacts that degrade the very ecosystems that underpin both rural and urban livelihoods. For example, schemes to promote industrial and intensive agriculture, as a path to economic development, carry substantial negative social, environmental and economic risks. Where land is removed from traditional uses and put to alternative uses, such as for the production of biofuels or other cash crops, if the needs of local farmers and workers are not accommodated, then the pressure is increased on the diminishing agricultural land-bank and risks are posed to rural livelihoods and food security. Such pressures may, in turn, increase the demand for land and resources currently maintained in protected areas, forest reserves, and unprotected natural areas. For example, there are suggestions that the USD 800 million of investments in large-scale rice farming being encouraged under Côte d'Ivoire's Cooperation Framework with the G8 New Alliance for Food Security and Nutrition, though aimed at improving rural conditions, will lead to the displacement of tens of thousands of small-holder farmers (GRAIN 2013).

Corruption in the hotspot has already been discussed in the section above on drivers, in relation to poverty and inequality but it is important to emphasis its role in entrenching weak governance and acting as a barrier to improved conservation outcomes. Transparency International's Corruption Perception Index (see Table 8.4), which is frequently used as a proxy indicator for the quality of governance in a country at national level, shows that Equatorial Guinea and Guinea have the highest perceived levels of corruption, and Ghana and Liberia the least among the hotspot countries. Corruption and a lack of transparency have in the past facilitated access to forests for logging; the potential for corruption to facilitate the approval of large land concessions and infrastructure projects without proper planning, assessment and risk mitigation is likely to emerge as another problem for conservation initiatives in the hotspot.

As described in Section 6.1.2, civil wars and conflict in parts of the hotspot, both past and present, have also been linked to poor governance, either as cause (such as conflict over the sharing of oil wealth and responsibility for environmental degradation in the Niger Delta) or a result (when an ongoing conflict or its aftermath reduces the rule of law). Côte d'Ivoire's two civil wars from 2002 to 2007, and from 2010 to 2011, have resulted in a highly unstable political situation and the country's significant forest loss between 2000 and 2010, including within forest reserves, may be linked to the impacts of conflict and the loss of government control. Conflicts in the hotspot have also resulted in mass movements of people within and among countries (e.g. from Sierra Leone to Guinea during the Sierra Leone civil war, 1991-2002), some of whom remain encamped in enclaves. This leads to increased pressure on local natural resources, with no social structures or regulation of land and resource exploitation to support sustainable use and conservation.

Effective conservation requires more than just appropriate policies and laws at the national level. It also requires effective implementation of laws, and good governance at the local level. Local level governance can often be improved, even where national level governance is weak, through the opportunities for experimentation, demonstration and locally specific reforms provided by projects implemented on the ground. Landscape or ecosystem approaches applied at the local level can also improve the governance of conservation and other initiatives. Such approaches involve gaining an appreciation of the way in which forests, protected areas, farming areas and water sources fit together to support local livelihoods, developing or strengthening management structures that support a variety of land uses, and encouraging different sectors and actors to work with one another, with potentially positive outcomes for governance.

8.3.3 Lack of Education, Awareness and Understanding for Effective Conservation

Attitudes to and awareness of natural resource management are key factors in the success or failure of efforts to achieve conservation and sustainable management. This is true at many levels, from national and regional policy-makers, to local communities, to international and national project developers in industries such as mining and agriculture. If biodiversity and ecosystem services are not understood and/or are under-valued, individuals and institutions are more likely to make decisions based on short-term gains and exploitation, rather than from a longer-term conservation and sustainable development perspective. Damaging and unsustainable developments often take precedence over conservation and sustainable management.

Education levels are a very significant factor in poverty alleviation, as well as conservation. Education (especially of girls) generally slows population growth rates, gives communities greater influence on policy and decision-making, and increases access to livelihood and income-generating options (Tuwor and Sossou 2008). On average, globally, just one year of school increases earnings by 10 percent (UNESCO 2014). West African literacy rates, though improving, remain among some of the lowest in the world (IRIN 2009). As Section 5.2.4 shows, adult literacy rates, as an indicator of education levels, vary considerably across the hotspot, from 94 percent in Equatorial Guinea (the highest), to 41 percent in Guinea (the lowest). Other countries with literacy rates in the 40-50 percent range include Benin and Sierra Leone. Enrolment rates in secondary and tertiary education in hotspot countries are also relatively low: the average secondary enrolment rate is about 34 percent, while the average tertiary enrolment rate is about 9 percent. In addition, only Ghana and São Tomé and Príncipe spend above the targeted 7 percent of GDP on education (World Bank 2015b).

Beyond the general levels of educational attainment, the content of education, such as the inclusion of environmental issues or presence of environmental curricula at tertiary level, is also relevant. The crucial importance of sustainable management of biodiversity and ecosystems for livelihoods opportunities and development, especially among the rural poor, is often ignored or overlooked. The lack of high-level knowledge and skills among civil society actors in conservation and biodiversity is another gap. As noted in Section 7.4, most national CSOs consulted felt that they have sufficient institutional capacities but lack technical knowledge in specific areas, and identified training needs on technical conservation and sustainable management, as well as governance issues.

8.4 Solutions: Approaches to Address Threats, Drivers and Barriers

The following section explores approaches to address the key threats identified in the hotspot, and where possible some of the drivers and barriers associated with those threats. It outlines some of the main conservation approaches applied in the hotspot in recent years, and based on the assessment of threats, root causes and barriers in the preceding sections, as well as priorities identified by stakeholders during consultations, suggests additional approaches. The discussed solutions are arranged according to the key threats they address, although these have been modified slightly to reduce repetition, because some solutions address multiple threats. In addition, approaches to climate change mitigation and adaptation are covered in Chapter 9.

8.4.1 Addressing Hunting for Bushmeat and Wildlife Trade, and Overfishing

In the case of unsustainable bushmeat exploitation, there is considerable debate in the academic literature and among conservation practitioners regarding how to address it. Globally, solutions proposed range from a total ban on all bushmeat hunting and sale (on the grounds that it is too difficult in practice to allow the sale of common species and forbid the sale of Red Listed ones), to the legalization and regulation of parts of the bushmeat trade. Within the hotspot, initiatives tackling overexploitation of wildlife for bushmeat include community-based approaches (e.g. the Bushmeat Hunting and Trade in the Nimba Mountains Project in Guinea, implemented by FFI with funding from CEPF), provision of alternative livelihoods (e.g. in the Conservation and Sustainable Use of the Ngoyla-Mintom Forest Project in Cameroon, led by WWF with funding from the GEF via the World Bank), and demand-side measures (e.g. the Awareness Campaign on the Bushmeat Crisis project in Ghana, implemented by CI with funding from CEPF) (see Appendix 9 for further examples).

Nasi *et al.* (2008) note that blanket bans on wild meat consumption are bound to fail, and, if enforced, would deprive poor families of much-needed nutrition and cash earnings. As a high value-to-weight product, easily preserved through smoking, wild meat is one of very few tradable commodities in remote areas. Rather, Nasi *et al.* (2008) recommend the application of lessons learned from the local management of inshore fishing in many parts of the world and from Indigenous People's reserves (e.g. in Latin America). In these cases, strengthening the rights of local people to manage their natural resources has resulted in much better protection for wildlife and rigorous exclusion of those without rights to the area. There is enough anecdotal evidence from within the hotspot to suggest that similar approaches might work there too – certainly in remoter and still well-forested areas.

The provision of alternative protein and income-generating sources has become one of the most widely used strategies at the community level to reduce bushmeat consumption and trade while aiming to improve (or at least have no negative impact on) local livelihoods (van Vilet 2011). However, while many such alternative livelihood projects have been implemented across West and Central Africa at various scales, there has been little analysis of their successes and failures, and little synthesis of lessons learned. A recent study of these projects conducted with project managers in West and Central Africa revealed that, while projects have had some success, they are based on many assumptions (e.g. about hunting drivers, market access, theory of change, etc.) that potentially undermine success (Wicander 2012; Wicander and Coad 2015). Restructuring is needed for future alternative livelihood projects to contribute more significantly to reducing the pressure of bushmeat hunting.

Given the complex and multi-dimensional nature of the bushmeat 'crisis', it is also crucial to integrate the various individual approaches into a comprehensive strategy. This includes the promotion of approaches that work with local communities to address the threats and barriers that operate at the local level, such as the exclusion of local people from natural resources governance and unclear tenure arrangements. A general conclusion that can be drawn is that approaches that take into account local conditions (e.g. understanding the actual socio-economic drivers of increased bushmeat consumption) and address the needs and rights of even the poorest and most remote hunters, traders and communities depending on this resource, are more likely to achieve sustained conservation outcomes. Other elements of a comprehensive strategy could include the institution of protected area management plans and regulations that allow comanagement and sustainable use of natural resources by local communities, (e.g. the co-management of Pendjari Biosphere Reserve in Benin), as well as measures related to consumer demand reduction.

There is a lack of initiatives in the hotspot or the West Africa region more widely that specifically tackle overexploitation of fisheries, whether marine or freshwater. For inland fisheries, the development and enforcement of fishery management plans is recommended. The potential for development of brush park or 'acadja' systems, which have been shown to enhance fisheries (Welcomme 2002), might also be investigated. Regional partnerships to govern marine habitats and wildlife in include the Canary Current Large Marine Ecosystem and the Guinea

Current Large Marine Ecosystem initiatives. There are also projects related to marine protected areas, including WWF's West African Marine Ecoregion program and a marine protected areas comanagement project in Sierra Leone and Liberia.

8.4.2 Addressing Forest Degradation: Logging, Fuelwood Collection and Charcoal Production

Efforts to reduce deforestation and forest degradation from logging (legal and illegal) have been prioritized by donors, governments and other actors in West and Central Africa. These efforts have been focused on the formal forest sector, as well as the protected area system, and include high-level forest sector planning, although more attention has gone to regional planning in the Congo Basin than in the hotspot. Restrictions and reforms to the forestry sector, including the reduction and cancellation of concessions, have contributed to contractions in the formal sector in the hotspot but potentially also to the expansion of the informal sector.

There has been progress in recent years with initiatives to develop legal and sustainable timber industries globally and in the hotspot. These include the promotion of forest law enforcement, governance and trade (FLEGT), through bilateral and multilateral initiatives, such as the EU's Voluntary Partnership Agreements (VPAs), which are currently being implemented with Cameroon, Ghana and Liberia and negotiated with Côte d'Ivoire. Forest certification is expanding, though remains largely limited to Cameroon and Ghana. All but one of the 37 valid certificates listed on the FSC database as of June 2015 (for both forest management and chain of custody) were for companies in these two countries; one company in Nigeria is also certified. In the case of some tree species (e.g. *Pericopsis elata*), there are CITES quotas in place and EU restrictions on import. For instance, the species is currently suspended from export in Côte d'Ivoire (see Section 6.2.4). There has also been some investment in partnerships with the private sector (e.g. the Wildlife Wood Project in Cameroon, which works with logging companies to promote low-impact logging practices and improved wildlife management in concessions).

Approaches in forestry also need to address threats and drivers related to the informal forestry sector. Karsenty (2007) notes that, in every country in the region, pro-active policies toward the integration of small-scale logging and processing activities into the formal economic sphere are much needed, and granting forest land on which logging can be done legally is essential. Small-scale producers are the main suppliers of timber for local demand. While there has been much international focus on efforts to verify the legality of timber for export from larger companies, the domestic sector has thus far received too little support and regulation. There are a few exceptions to this, such as the EU-funded Developing Alternatives for Illegal Chain Saw Milling through Multi- Stakeholder Dialogue project in Ghana. The same need for support and regulation applies to the supply of fuelwood and charcoal, which are likely to remain important sources of energy (for homes and businesses) in the hotspot well into the future.

Community-based natural resource management is one strategy to address the threats to forests and biodiversity posed by informal and unregulated logging, fuelwood collection and charcoal production. In addition to the maintenance and updating of some traditional community conservation practices (such as sacred forest sites in Nigeria and Ghana, or the 'modified taungya' agroforestry system in Ghana), there are other foundations for community forestry in the hotspot that can be built upon. These include community forestry by-laws and forest management committees in Nigeria, as well as county forest forums in Liberia.

The extension and effectiveness of community forestry in the hotspot will rely on addressing the fundamental barrier posed by current tenure arrangements. This applies to fuelwood and charcoal initiatives as well, because trees outside of forests play an important part in supplying these products. Agroforestry, or 'on-farm' trees, could help meet this demand, provided farmers have secure tenure over these resources. Fuelwood and charcoal initiatives also need to address the issue of sustainability. Although it is clear that these will remain important sources of energy, continued use of fuelwood and charcoal have negative impacts on the environment (through greenhouse gas emissions) and health (through indoor air pollution), and thus improved practices are required. In Ghana and Nigeria, there are projects to promote efficient wood stoves and 'green' charcoal (see Appendix 9), but these need to be extended to other parts of the hotspot and implemented on a larger scale if they are to have greater environmental and health benefits.

8.4.3 Addressing Conversion of Forests and Other Habitats: Agricultural Development and Infrastructure

The threats to habitats and biodiversity posed by the expansion of agriculture (particularly commercial plantations) and the development of large-scale infrastructure projects in the hotspot are emerging as increasingly important issues for the conservation sector. Addressing these threats will also likely require the formation of new strategies and partnerships with other sectors.

Landscape-scale approaches have been implemented in the hotspot, recognising the links between different land-uses and ecosystem services, and the need for ecosystem approaches. These include landscape initiatives, such as the Conservation of the Western Area Peninsula Forest Reserve and its Watersheds project in Sierra Leone, as well as the establishment of conservation corridors and transboundary protected areas, such as the Cestos-Sapo-Grebo-Taï-Cavally Corridor between Côte d'Ivoire and Liberia.

Landscape-scale, ecosystem-based approaches should continue to form one of the core strategies for improving conservation outcomes in the hotspot. However, they may increasingly need to work outside of protected areas and in partnership with key actors in agricultural expansion and infrastructure development, including government agencies outside of the forest/conservation sector, the private sector, and communities affected by policies and projects aimed at transforming the economies and landscapes they live in. Such approaches should be based on a full assessment of the links between forests, water bodies and other ecosystems, and protected areas, agricultural areas, urban areas and emerging industries. Specific tools and methods may include the promotion of integrated and participatory land use planning, as well as integrated water resources and coastal zone management. Ecosystem-based adaptation to climate change, or the integration of ecosystem services into other kinds of adaption planning, can also contribute to landscape-scale planning that aims to maintain ecosystem services that are important for future livelihoods and resilience.

Improved governance is needed to facilitate such landscape-scale approaches, and to reduce the negative impacts on the environment and people from agriculture and infrastructure projects. Often involving partners outside of the conservation sector, these approaches may include:

i. Helping governments to develop sustainable investment and infrastructure plans (e.g. that aim to attract sustainable investors or that site infrastructure in the most suitable locations);
ii. Strengthening land-use planning and zoning processes (e.g. ensuring consultation among sectors and the consideration of biodiversity and ecosystem services);
iii. Adjusting fiscal and other frameworks that incentivise poor environmental/social practices;
iv. Strengthening EIA processes (from ensuring that the required EIAs are performed through to the implementation of environmental management plans);
v. Asking financiers to apply lending and safeguard policies; and
vi. Supporting the monitoring of agriculture and infrastructure projects, and the sanctioning of companies that fail to abide by agreements or standards.

There is also scope to promote more sustainable models for agricultural and infrastructure projects, such as conservation agriculture, sustainability certification, climate-smart infrastructure development, and so on. Currently in the hotspot, industry sustainability initiatives are focused on oil palm companies and concessions (e.g. the West Africa Fair Fruit initiative promoting RSPO certification and small-holder capacity building). In addition to promoting certification or the application of sustainability guidelines in other sectors (e.g. rubber, eucalyptus, rice, sugarcane), another potentially useful strategy is to explore alternative models for plantation development that reduce the negative environmental and social risks associated with large-scale monoculture concessions. In particular, such models may avoid projects that displace small-holder farmers and result in further deforestation as well as potentially exacerbate economic hardship and food insecurity for communities.

8.4.4 Addressing the Impacts of Energy Production and Mining

Impacts associated with the threats posed by energy production and mining include habitat loss and modification, as well as environmental degradation from pollution and secondary effects (e.g. mining roads providing access to forests for hunting and logging). As discussed in Section 8.1.3, the mining, oil and gas industries in the sector are also linked to negative socio-economic and political impacts, such as conflict, corruption and sudden economic shifts for small communities. There are a number of initiatives in the hotspot that aim to address these threats, including the EITI and Publish What You Pay initiatives. Partnerships with mining and energy companies include the Niger Delta Shell-Wetlands International wetlands program in Nigeria, and the Arcelor Mittal/East Nimba Nature Reserve and Biodiversity Conservation Programme in Liberia. There have also been investments in ecosystem restoration, focused on repairing the damage from oil exploitation and conflict in the Niger Delta. Restoration remains a priority in these parts of the hotspot.

As the mining and energy industries expand in the hotspot, the conservation sector will need to work more with companies and with the government agencies responsible for planning, approving and monitoring these projects. Similar to addressing threats posed by agriculture and infrastructure, improved governance (such as better planning and EIA implementation, as well as requirements for restoration funds/plans) will be a key part of this strategy. Among large, international mining and energy companies, corporate social and environmental responsibility programmes are increasingly the norm, and partnerships with local and international CSOs are relatively common. This is rarely the case among small and medium-scale companies, and companies with less exposure to international markets. In these cases, the role of government in enforcing environmental and social protection measures is very important.

Hydropower schemes pose several other challenges. Energy shortages in hotspot countries indicate that hydropower is likely to expand as part of the energy mix. However, further assessment (at an ecosystem level) is needed of the costs and benefits posed by these schemes to the environment and communities in the hotspot, as well as by dams outside the hotspot with potentially far-reaching impacts, such as those planned for the Niger and Volta Rivers (e.g. see Thomas Reuters Foundation 2013). It may help to build on or transfer experiences from other countries and regions in strategic environmental assessment (SEAs) and optimisation of hydropower development (i.e. studying the most efficient and low risk options for hydropower or other types of energy production). Alternatives to large hydropower schemes (e.g. alternative renewable energy sources or alternative hydropower models) may be deemed more appropriate, cost-effective and lower risk. IIED reports that, in April 2014, ECOWAS member states approved a draft guideline for developing water infrastructure in West Africa, which aims to better regulate hydropower development. The guideline states that large dams should be evaluated at least every 10 years assessing economic, social and environmental impacts and informing decisions about future investments and policy-making.

8.4.5 Addressing the Impacts of Residential and Commercial Development

The threats posed by expanding residential and commercial development in the hotspot have some similarities with energy and mining, insofar as they result in habitat loss and modification, as well as environmental degradation from waste and other types of pollution. These threats are relatively poorly addressed by current conservation initiatives in the hotspot, potentially due to the still emerging picture of urbanization and population movements in the region. Currently, there are few examples of integrated land-use planning or coastal zone management initiatives, or sustainable consumption, production and waste management projects. Projects aimed at conserving and restoring mangrove ecosystems include the Mangroves in West Africa Initiative in Guinea and Sierra Leone, and the Building Mangrove Resilience to Climate Change in the Douala-Edea, Ntem and Rio del Rey Estuaries project in Cameroon. Lessons learned by existing integrated river basin authorities within the hotspot (e.g. the newly created Volta River Basin Authority) and beyond need to be shared and additional authorities established. These authorities should be encouraged to work with ECOWAS to promote integrated river basin management in the hotspot. As part of this process, environmental flows should be assessed, to ensure sufficient flows remain in rivers to maintain the ecological functions of wetlands and their continued provision of services such as water purification, fisheries production and flood control.

An important element in addressing this threat to biodiversity in the hotspot is improving knowledge and data about the current situation. Urbanization and patterns of population movements are relatively complex. As described in Section 5.2.2, it is not simply a case of rural people moving to large coastal cities, although that occurs as well. Strategies to address the impacts of urbanization and commercial development, such as improved waste management or city planning, will thus need to be appropriate to small urban centers as well as large cities. There is also a lack of recent data on the extent of pollution and waste disposal problems, and the extent of the conversion of wetlands, so studies of these issues should be encouraged.

Although a number of the interventions to address threats from residential and commercial development are necessarily related to environmental management and sustainable production and consumption (as opposed to green-field conservation), as with addressing the impacts of agriculture and infrastructure development, landscape-scale, ecosystem-based approaches should be included. An ecosystem-based approach will help to incorporate the links between what happens on land (deforestation, erosion, agricultural chemical use, irrigation) and impacts in freshwater, coastal and marine environments (e.g. sedimentation, water pollution, reduced freshwater flows). An ecosystem-based approach can also provide a more realistic or accurate way to set targets for water consumption or limits for waste emissions. Similarly, a strong link can be made between ecosystem-based approaches in the coastal zone and climate change adaptation initiatives. Effective adaptation options for the hotspot's urban areas, in particular, will be linked to the health of coastal and other ecosystems, which provide the ecosystem services that will support future resilience to climate change.

8.4.6 Addressing Invasive Species and Disease

The threats posed to biodiversity in the hotspot by invasive non-native species, problematic native species and disease were relatively low-ranked by workshop participants and the Red List analysis. This may be partly due to a lack of available data on these threats. Current initiatives in the hotspot related to invasive species and diseases are limited. There are some projects on control of water hyacinth in Cameroon and Benin, as well as a recent trial of an Ebola (Zaire strain) vaccine for chimpanzees, conducted in the United States (see Warfield *et al.* 2014). In São Tomé and Príncipe, the ecology and impact of invasive species is currently poorly understood, meaning that the first step for action should be identifying the key threats, and then defining a strategy to tackle them.

Research and monitoring will be a key element in strategies to address these impacts. In particular, more information is needed on which diseases of which species are of the greatest conservation concern in the hotspot. For example, there is still limited evidence of impacts from Ebola in hotspot primate populations but the risk profile may be changing. Other diseases may be more prevalent among primate populations in the hotspot, such as SIV and malaria. Similarly, the expansion of agriculture and aquaculture in the hotspot may bring an increased risk from invasive species (such as GIFT tilapia, see Section 8.1.10).

8.4.7 Addressing Key Barriers: Participation, Knowledge and Awareness

This chapter points out that a lack of participation of local communities and other actors in environmental governance, as well as low awareness and knowledge regarding biodiversity and ecosystem values, still form key barriers to promoting conservation outcomes in the hotspot. Although conservation awareness-raising, capacity building and education have long been a target of investment in the hotspot, continued support in fostering awareness and understanding of biodiversity and ecosystem values is recommended, and this should be extended, not necessarily to a wider audience but to a more targeted one.

There is now a stronger recognition that local people play a vital role in the success of conservation projects. There is also a growing recognition of the role of other actors and drivers of environmental change, and a need to engage them on conservation issues (e.g. city dwellers and international markets for wildlife products, and banks and companies involved in developing commercial projects). Efforts need to move beyond awareness raising for changing local behavior, to a multi-sectoral approach that can engage non-conservation sector actors from government and the private sector, and provide a platform for these sectors to communicate with each other. These should utilise the expanding range of tools currently being used to communicate biodiversity and ecosystem values (including intrinsic, cultural and option values), with a consideration of how this information can be best communicated to decision-makers (political, social and private sector). Within the hotspot, it is also advisable to continue to build up the capacity of local organizations to carry out this kind of comprehensive, multi-sector awareness raising work and to address issues related to environmental governance. This is potentially a different set of knowledge and skills than those needed for working with communities on the ground.

Related to effective advocacy for the environment is a continued need for more detailed and longer term information on biodiversity status and trends, and on the impacts of conservation interventions. There has already been an improvement in the biodiversity information available in the hotspot (e.g. through efforts such as the Pan-Africa Freshwater Biodiversity Assessment coordinated by IUCN) and work has gone into improving regional monitoring processes. However, projects that can provide detailed monitoring data against useful indicators over a long period of time tend to be exceptions rather than the rule (e.g. where long-term funding is available for biodiversity conservation in a landscape). It will become increasingly important to have long-term biodiversity and ecosystem services data over different landscapes and conditions of environmental change. Monitoring data that can illuminate the biodiversity and other benefits of conservation interventions will help to show that these are effective land-use strategies.

9. CLIMATE CHANGE

9.1 Climates of the Guinean Forests Hotspot

9.1.1 Climatic History

The Guinean Forests Hotspot includes two of Africa's six main climatic zones, namely 'humid' and 'subhumid humid' (ECOWAS-SWAC/OECD 2008). Mean temperatures in the hotspot countries remain remarkably constant through the year and across the region, although annual maximum temperatures range from around 30°C to 36°C, with the cooler areas being nearer to the coast and further south (Hijmans *et al.* 2005). The hotspot's precipitation regimes, however, vary more markedly (see Table 9.1).

Table 9.1 Precipitation and Rainfall Averages and Trends for the Hotspot Countries

Country	Temperature (°C)		Precipitation (mm per month)	
	Mean 1970-1999	Trend 1960-2006 (change per decade)	Mean 1970-1999	Trend 1960-2006 (change per decade)
Benin	26.8	0.24	88.1	-1.7
Cameroon	24.1	0.15	129.7	-2.9
Equatorial Guinea	24.2	0.14	177.0	-3.7
Ghana	26.6	0.21	98.0	-2.3
Guinea	25.6	0.18	134.7	-4.5
Liberia	25.0	0.18	186.4	-5.4
Nigeria	26.2	0.18	95.8	-1.1
Sierra Leone	25.7	0.18	197.8	-6.9
Togo	26.5	0.24	95.9	-2.3

Source: McSweeney et al., 2010.
Note: Data were unavailable for Côte d'Ivoire and São Tomé and Príncipe.

Benin has the lowest average monthly rainfall of all hotspot countries (88.1 mm) with an average of only 16 mm from January to March. Nigeria, Togo and Ghana also have relatively low mean monthly rainfall, with 95.8 mm, 95.9 mm and 98.0 mm respectively. The wettest hotspot countries are Sierra Leone, Liberia and Equatorial Guinea, with mean monthly rainfall of 197.8 mm, 186.4 mm and 177.0 mm respectively. Greatest variability in annual precipitation occurs in Guinea, which has both the highest (329 mm) and third lowest (13 mm) per quarter monthly rainfall averages. In West Africa, the onset of the rainy season is a key factor triggering changes in the vegetation, as well as feedbacks to the local atmospheric heat and moisture cycle. The length and frequency of dry spells as well as the length of the rainfall season also affect this, and all are affected by a large inter-annual variability (Janicot *et al.* 2011, Rodríguez-Fonseca *et al.* 2011).

9.1.2 Observed Recent Climatic Changes

The latest Intergovernmental Panel on Climate Change (IPCC) reports that each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850, and almost the entire globe has experienced surface warming and sea level rise at rates greater than during the previous two millennia (IPCC 2013). In West Africa, increases in both the frequency and intensity of droughts have been observed (Hartmann *et al.* 2013). The western Sahel region has remained dry following the droughts of the 1970s, while the eastern Sahel has returned to wetter conditions (Rhein *et al.* 2013). The IPCC concludes that the region has experienced an increase in dryness overall (medium confidence) and greater inter-annual variability than the previous 40 years (IPCC 2013).

In the hotspot region, McSweeney *et al.* (2010) report average per decade temperature increases of between 0.14°C (Equatorial Guinea) and 0.24°C (Benin and Togo) from 1960-2006, while most other countries have experienced increases of 0.18 °C per decade (see Table 9.1). Conversely, hotspot countries' mean monthly precipitation has shown a general decreasing trend over this period, with mean per decade declines ranging from 1.1 mm (Nigeria) to 6.9 mm (Sierra Leone). Precipitation seasonality has also altered, and despite the overall declining trend, some per quarter means have increased, such as Benin's October to December mean (by 0.5 mm per decade) and Nigeria’s December to February and September to November means (by 0.6 mm and 1 mm per decade respectively).

9.1.3 Projected Future Climatic Changes and Sea Level Rise

Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Even if emissions are stopped immediately, the gases already emitted will result in persistent global mean surface warming until the late 21st century and beyond, along with most other aspects of climate change (IPCC 2013). This section discusses the IPCC’s projections of future climate and other environmental changes, as well as its confidence in them. The section also presents more detailed model predictions for the hotspot region, using downscaled climate projections produced by York University in the UK (Platts *et al.* 2014). These models describe four possible climate futures, known as Representative Concentration Pathways (RCPs), which are all considered possible, depending on the amounts of greenhouse gases emitted in the coming decades.

Temperature Changes

Global surface temperature changes for the end of the 21st century are likely to exceed 1.5°C relative to the pre-industrial era (1850-1900) (projected for all RCPs except one) and warming will continue beyond 2100 (projected for all RCPs except one). For Africa, at a continental scale, the limited degree of climatic measurement limits opportunities for testing model predictions and, hence, confidence in them (Rhein *et al.* 2013). However, the IPCC concludes with high confidence that warm days and nights are likely to increase and cold days and nights to decrease, and that it is very likely that all of Africa will continue to warm during the 21st century (Christensen *et al.* 2013). Table 9.2 provides a summary of projected changes in temperature and precipitation, showing that West African warming will be greater than the global average, reaching the 1.5°C by 2065, rather than the 2100 global projection. By 2100, the high-end scenario projects a change in mean annual temperature of up to 3.2°C averaged across the region, while more optimistic scenarios limit this to about 1°C (Christensen *et al.* 2013).

Table 9.2: Projected Changes to Mean Annual Temperature and Precipitation for West Africa

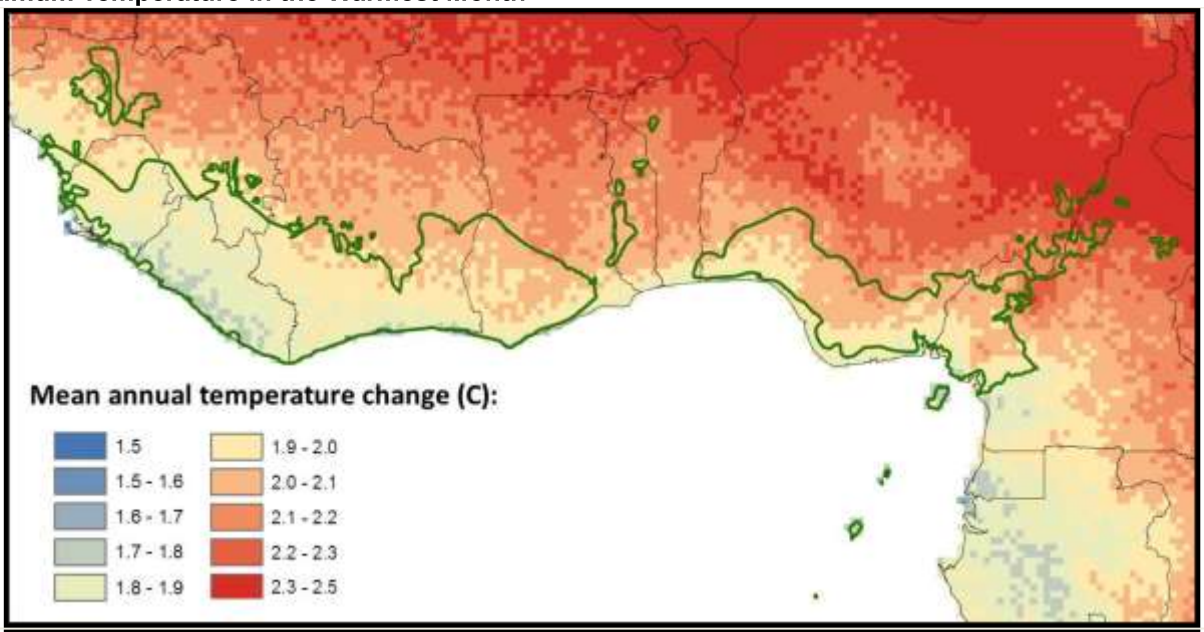
Year	Projected Temperature Change (°C)			Projected Precipitation Change (%)		
	Minimum	Median	Maximum	Minimum	Median	Maximum
2035	0.6	0.8	1.2	-4	1	8
2065	1.1	1.5	2.5	-10	2	6
2100	1.0	1.9	3.2	-8	3	8

Source: Christensen *et al.*, (2013).
Note: Changes are measured as the difference between a baseline period (1986-2005 average) and projected periods (2016-2035, 2046-2065 and 2081-2100) of the RCP4.5 experiments. Based on the difference between these two periods, the table shows the 50th percentiles, and the lowest and highest response among 42 models.

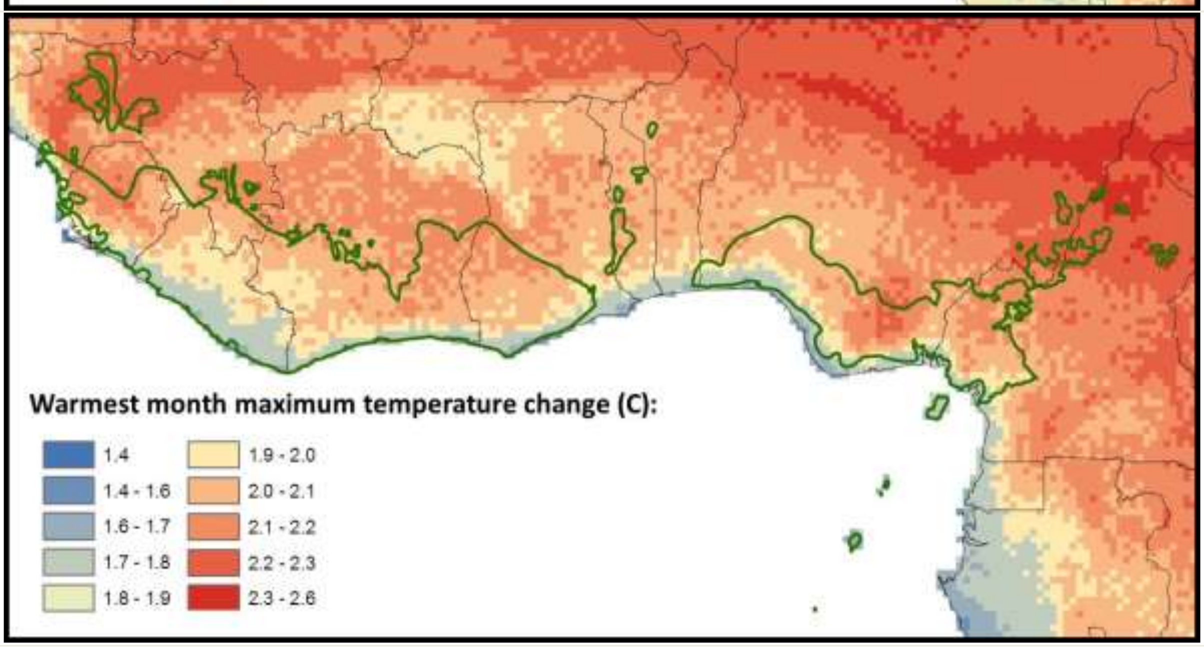
Regionally downscaled projections of temperature changes in West Africa between a baseline of 1995 (mean of 1986-2005) and 2055 (2041-2070), are shown in Figure 9.1. These show a clear pattern of overall warming in both mean and maximum temperatures, and a trend of increasing change from coastal to interior regions. Analyses of trends in these projections within the hotspot alone (carried out by the authors) show that, on average, mean annual temperatures are predicted to increase by 1.9°C by 2055 (from 25.6°C to 27.5°C), and approximately 35 percent of the hotspot’s area has a projected mean annual temperature increase of greater than 2°C. Intra-annual variability in monthly mean temperatures is predicted to remain relatively constant (1.5^{o}C). Mean maximum monthly temperatures for the hotspot (which are representing means of temperatures including by day and night) are expected to rise by a similar amount on average by 2055 (30.5^{o}C to 32.3^{o}C), with predicted maximum mean diurnal temperatures of over 40^{o}C in March and April, and over 35^{o}C for all but July, August and September, by this time.

Figure 9.1 Regionally Downscaled Projections of Changes in (a) Mean Annual Temperature and (b) Maximum Temperature in the Warmest Month

a.



b.



Source: Platts *et al.* (2014).

Note: Temperature change compares 1975 (based on a mean of 1961 to 1990) and 2055 (based on a mean of 2041-2070), based on the RCP 4.5 scenario.

Precipitation Changes

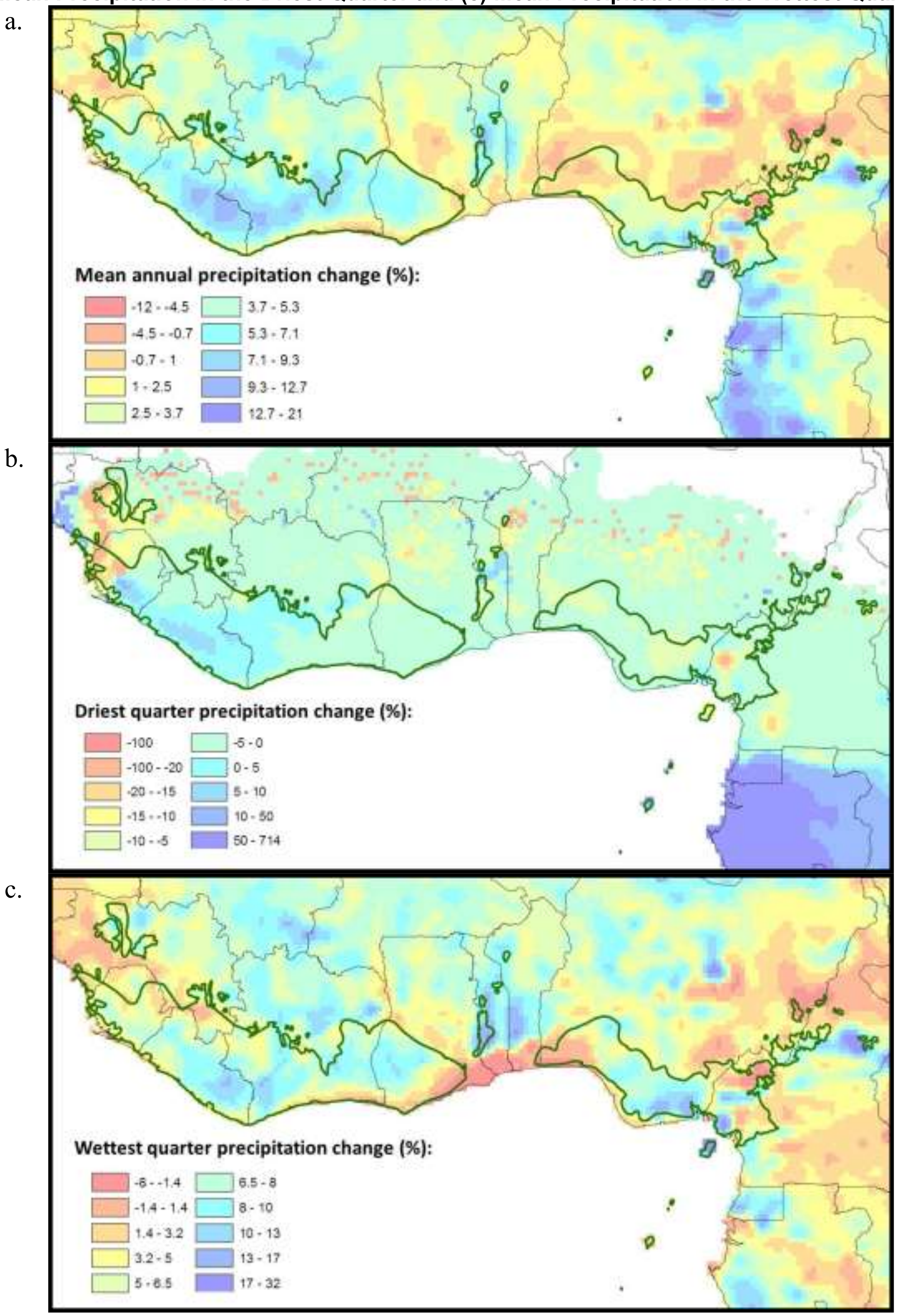
Projections of changes to precipitation regimes in West Africa are uncertain and the differences in projections between different models and RCPs is considerable (Christensen *et al.* 2013). This is due, in particular, to the complex nature of the West African monsoon system. Overall, most Africa-wide and regional projections broadly suggest an increase in rainfall in the region, and a possible small delay in the development of the West African rainy season (low confidence). Should the latter occur, its impact would be considerable, given the key role rainy season onset plays in triggering vegetation changes and local atmospheric heat and moisture cycle feedbacks (Christensen *et al.* 2013).

Figure 9.2 shows the proportions of precipitation changes predicted by regionally downscaled climate change projections (Platts *et al.* 2014). Both mean annual precipitation and mean precipitation in the wettest quarter (June to August) show a general trend of increasing rainfall, except in the Dahomey Gap and inland areas of southeastern Nigeria where conditions become drier. A pattern of fairly consistent drying, however, occurs in the driest quarter of the year (December to February), suggesting that variability in precipitation in the region is likely to increase.

Within the Guinean Forest Hotspot, analyses of downscaled projections (Platts *et al.* 2014) by the authors suggest an average increase of 8.1mm (4.9 percent) in mean monthly precipitation, along with a small increase in variability. Greatest increases in mean annual precipitation by 2055 are predicted to occur in the central areas of the western block of the hotspot, including the inland area of the Upper Guinean Forests subregion, eastern coastal Nigeria and parts of north coastal Cameroon. Greatest declines in mean annual precipitation are predicted for coastal Côte d'Ivoire and Ghana, the western Nigerian components of the hotspot and parts of topographically diverse northwestern Cameroon.

Predicted changes in driest quarter (December to February) rainfall by 2055 include dramatic decreases in hotspot parts of Guinea, coastal Sierra Leone and a small area of northwestern Cameroon. Increases in driest quarter precipitation of more than 10 percent are predicted in parts of Liberia, Sierra Leone and São Tomé and Príncipe but relatively little change is predicted for the majority of the hotspot. Patterns of predicted change in mean precipitation in the wettest quarter (June to August) by 2055 are similar to those of mean annual precipitation changes, with increases of less than 10 percent in central parts of the Upper Guinean Forests subregion (including Liberia, Côte d'Ivoire and Ghana), as well as eastern coastal Nigeria and parts of northern coastal Cameroon, and with the addition of central Togo. Declines in mean precipitation are less severe for the wet season compared to annual averages though coastal Côte d'Ivoire and Ghana, while parts of northwestern Cameroon show the greatest declines.

Figure 9.2 Regionally Downscaled Projections of Changes in (a) Mean Annual Precipitation, (b) Mean Precipitation in the Driest Quarter and (c) Mean Precipitation in the Wettest Quarter



Source: Platts *et al.* (2014).
Note: Precipitation change compares a mean of 1975 and 2055, based on the RCP 4.5 scenario.

Extreme Events

IPCC (2012) projections for West Africa, predict increases in warm days and nights and decreases in cold days and nights with high confidence, along with an increase in the 20-year return value of the annual maximum hottest day. An increase in frequency and/or duration of heat waves is also predicted with high confidence. Predictions relating to the region's precipitation, consecutive dry days and soil moisture are of low confidence, however, due to disagreement among models. An increase in precipitation extremes related to the monsoon is considered very likely in Africa as a whole, however, and modeling by the Meteorological Research Institute and Japan Meteorological Agency (Hirabayashi *et al.* 2008) show an increase in the risk of floods in tropical Africa with resulting risks of slope instabilities and landslides. A possible intensification of late-season rains in West Africa has also been noted (IPCC 2013).

Sea Level Rise

A comparative study on the potential for coastal inundation resulting from a 1 meter sea level rise in 84 developing countries found that North and Sub-Saharan Africa were amongst the eight regions at greatest risk (Dasgupta *et al.* 2008). Sea level rise implications for West Africa are likely to be significant and most severe for its oceanic islands and estuaries. These may include coastal erosion, damage to infrastructure and salination of freshwater resources and farmlands.

The hotspot boundary avoids the coast in some of its constituent countries. Nonetheless, an analysis carried out by the authors found that approximately 2,300 km^2 of the hotspot area (0.4 percent) occurs at or below 1 meter above sea level, making it extremely vulnerable to sea level rise, while a further 600 km^2 falls at or below 2m above sea level. These low-lying areas are mainly along coastal sections of the hotspot in southern Sierra Leone, southwestern Nigeria and western Cameroon, as well as lower stretches and estuaries of the region's major rivers, including the Rokel (Sierre Leone), Sanaga (Cameroon) and Niger (Nigeria).

9.2 Impacts of Climate Change

Africa is particularly vulnerable to the impacts of climate change, due to widespread poverty, recurrent droughts, inequitable land distribution and rain-dependent agriculture (IPCC 2013). Concerns include impacts on both natural systems (e.g. biodiversity, forestry and coastal ecology) and human livelihoods (e.g. access to water and food resources, health and economies). In preparation for climate change, each hotspot country has developed national action plans, strategies and/or communications describing the climate change impacts about which they are most concerned. Table 9.3 classifies these into broad categories of impacts. Agricultural and livestock impacts, particularly on farmers, were listed as a vulnerability by all countries except São Tomé and Príncipe. Impacts on mangroves and coastal zones were the next most commonly listed concern, and impacts of climate change on water resources and catchments, fisheries, and drought or soil drying listed third most often, each by six countries. Impacts on urban areas, human migration, national security and vegetation loss were listed least often, each by only a single country. These findings are valuable for understanding national governments' concerns about climate change and for identifying areas where further vulnerability assessment and information sharing might be necessary.

Table 9.3 Overview of Vulnerabilities Identified by Hotspot Countries in their NAPAs and Other Adaptation Strategies and Communications

Vulnerability	Benin	Cameroon	Côte d'Ivoire	Ghana	Guinea	Liberia	Nigeria	São Tomé & Príncipe	Sierra Leone	Togo	Total
Agricultural and livestock impacts, farmers	x	x	x	x	x	x	x		x	x	9
Biodiversity			x			x	x				3
Catchments/water resources	x		x		x		x	x		x	6
Coastal municipalities	x					x	x		x		4
Coastal zone/ mangroves		x	x	x	x		x	x		x	7
Drought/drying of soils	x				x		x	x	x	x	6
Delayed/changed timing of rains	x								x	x	3
Disease/health		x			x		x		x	x	5
Flooding	x				x			x	x	x	5
Fishers/fisheries	x		x		x			x	x		6
Food security		x	x	x					x		4
Forests, savannah and NTFPS					x	x			x	x	4
Heavy rain and storms	x							x			2
High temperatures	x				x						2
Industry/infrastructure					x		x	x			3
Land degradation		x	x					x			3
Landslides/erosion								x	x		2
Loss of vegetation					x						1
Marine impacts		x	x	x							3
Migration/displacement								x			1
Security							x				1
Settlements/urban areas							x				1
Source	NAPA 2008	Nat. Comm.	Nat. Comm.	NC-CAS 2012	NAPA 2007	NAPA 2007	NA-SPA-CCN, 2011	NAPA 2008	NAPA 2011	NAPA 2009	

Sources: NAPA = National Adaptation Programme of Action; Nat. comm. = National Communication to UNFCCC; NCCAS= National Climate Change Adaptation Strategy; NASPA= National Adaptation Strategy and Plan of Action
Note: Classification of vulnerabilities was devised by profiling team. No NAPA, strategy or other relevant document was identified for Equatorial Guinea.

9.2.1 Impacts on Biodiversity

Direct Impacts of Climate Change on Biodiversity

Changes in local temperature and precipitation have the potential to directly affect Africa's rainforests and have led to large ecological shifts on millennial timescales (Malhi and Wright 2004). These changes are likely to be mediated and affected by changing fire regimes, as well as by increasing numbers of invasive species and new pathogens and diseases. To date, West Africa has been relatively poorly covered by assessments of climate change vulnerability of biodiversity, although recent initiatives such as PARCC (Protected Areas Resilient to Climate Change 2010) have made sound progress towards addressing this. Since most studies focus on one or a few taxonomic groups, their results are discussed by group in the following sections. It should be noted, however, that tropical ectotherms, such as amphibians, reptiles, fishes and invertebrates, are likely to face disproportionally large impacts from even small shifts in temperature because they are currently living very close to their optimal temperature (Deutsch *et al.* 2008).

Amphibians

Global studies on amphibians by Hof *et al.* (2011) and Foden *et al.* (2013a) predict that West African species are of medium to high climate change vulnerability on a global scale, with the region of greatest risk overlapping with the Guinean Forest Hotspot. Garcia *et al.* (2012) made the opposite finding that, at an African scale, the region has by far the lowest vulnerability of any region, with up to 35 percent of species retaining suitable climate by 2050. A West African study by Carr *et al.* (2014), which covered most of the hotspot, showed that greatest numbers of climate change vulnerable amphibians occur in the Niger Delta region by 2055, spreading westward to most of the hotspot by 2085.

Mammals

Most of the hotspot was found to be of high climate change risk for mammals by Thuiller *et al.* (2006), although Garcia *et al.* (2014) also examined climate change vulnerability of African terrestrial mammals and suggested the region was of intermediate vulnerability. Carr *et al.*'s (2014) West African study predicts greatest mammal climate change vulnerability in the forested hotspot region, largely reflecting the high species richness there. A study of climate change impacts on great apes (Lehmann *et al.* 2010) found that while their range south of Cameroon becomes increasingly unsuitable, most of the hotspot remains suitable to 2100.

Birds

Global assessments of bird climate change vulnerability by Hannah *et al.* (2013), Garcia *et al.* (2012) and Foden *et al.* (2013a) suggest that the avifauna of the hotspot is of intermediate vulnerability to climate change, both in the African context and globally. Carr *et al.*'s (2014) West African study showed that climate change vulnerable bird species are concentrated in the forested hotspot region. The western part of the hotspot (Sierra Leone, Liberia and Cote d'Ivoire) and northwestern Cameroon are highlighted as regional priorities for adaptation interventions by Hannah *et al.* (2013) due to their high projected loss in habitat suitability for range-restricted birds. New assessments on climate change impacts on the birds of the region by researchers from the University of Durham are expected to be released soon but were not available for inclusion in the ecosystem profile.

Reptiles

Carr *et al.* (2014) found greatest reptile climate change vulnerability in the hotspot region of West Africa, but predicted that by 2085, the Dahomey Gap would face the greatest risk. Garcia *et al.* (2012), however, found the area to have amongst the highest retention of climatic suitability for snakes in Sub-Saharan Africa. Because of the low thermal safety margins, tropical lizards and turtles such as those occurring in the hotspot are predicted to fare poorly under climate change (Deutsch *et al.* 2008).

Plants

McClean *et al.* (2005) found that the hotspot emerged among the areas of highest vulnerability in Africa, with the Dahomey Gap and the Upper Guinean Forests subregion emerging as particular priorities. A study on the effects of climate change on the richness of crop wild relatives of the chickpea and Bambara groundnut in Africa (Jarvis *et al.* 2008) predicts dramatic declines in numbers of these species in most of the hotspot.

Freshwater Ecosystems

Thieme *et al.* (2010) found that African ecoregions such as the hotspot, which contain high proportions of freshwater fish species and several outstanding ecological and evolutionary phenomena, are likely to experience hydrologic conditions substantially different from the present. Carr *et al.*'s (2015) West African study showed the Niger Delta and Sierra Leone to be the parts of the hotspot containing the greatest numbers of climate change vulnerable freshwater species.

Indirect Impacts of Climate Change: the Effects of Human Reactions and Responses on Biodiversity

Despite increasing recognition that human responses to climate change will result in impacts on biodiversity additional to those occurring through more 'direct' mechanisms (Turner *et al.* 2010; Watson and Segan 2013), most assessments, including almost all of those described above, fail to include them. Masumbuko and Somda (2014) provide a review of the subject for five West African countries, including the hotspot countries of Sierra Leone and Togo, and give particular attention to impacts on protected areas. Although empirical evidence remains sparse to date, perhaps the most commonly anticipated impacts in West Africa relate to climate driven changes in agricultural practices and productivity. Decreases in agricultural productivity are likely to necessitate increased dependence on wild natural resources (e.g. bushmeat, edible wild plants), which could place additional pressure on wild species, and in certain cases could lead to an increase in (often illegal) resource harvesting from protected areas (Masumbuko and Somda 2014).

Similarly, any reduction in precipitation, whether annual or seasonal, could necessitate increased water abstraction from new, previously unused, natural sources (USAID 2013), thereby impacting biodiversity and freshwater species in particular. Unsustainable water abstraction has already been shown to be negatively impacting biodiversity in the region (Smith *et al.* 2009). Similarly, dams, sea walls and other human structures designed to alter water courses, respond to climate change impacts or generate electricity can affect riverine wildlife communities as well as downstream wetlands and marine ecosystems (Bonnardeaux 2012). Other impacts to biodiversity are likely to occur as a result of climate change-driven human migration to new areas (International Organization for Migration 2008), whereupon increased human presence can exacerbate many of the threats described in Chapter 8 of this profile (Eastaugh 2010).

Including Climate Change in Conservation Planning

As species move in response to shifting climates, the ability of existing protected area networks to meet their objectives may change, including those objectives related to conservation of target species and areas of greatest species richness. New areas may gain importance in a landscape due to their role as corridors for species movements or for their ability to provide refuge for species through their high topographic (and hence microclimatic) heterogeneity or because they contain important microhabitats (e.g. boulders, lakes, caves, canyons, etc.). Others may cease to be important, as target species move away or go extinct, they become degraded or inundated by sea water or their use by humans changes. As a result, protected area networks need to be re-evaluated for their conservation effectiveness in light of climate change. Such re-evaluation is currently being carried out for West Africa by the GEF-funded PARCC project, although results were not available at the time of writing this report. Encouragingly, however, Hole *et al.* (2009) show that, in the hotspot, projected turnover of breeding bird species in IBAs is only 0-20 percent, the hotspot is perhaps the least affected by turnover in all of Sub-Saharan Africa.

9.2.2 Impacts on Water

Relatively few catchments provide the main surface water resources within the West Africa region, principally the Niger, Senegal, Gambia and Volta Rivers and Lake Chad. Stream flows in these sources has already dropped significantly, with the Niger River's stream flow, for example, falling by 30 percent between 1971 and 1989 and those of the Senegal and Gambia Rivers falling by almost 60 percent (ECOWAS-SWAC/OECD 2008). In many areas, groundwater recharge is likely to decline, with groundwater shortages exacerbated by an increase in water demand and abstraction. Salination of freshwater resources and land is of particular concern, both from natural sources and sea water intrusion, but will be ameliorated to some extent if rainfall and or monsoonal activity increases. In combination with a predicted increase in frequency and intensity of drought (Hartmann *et al.* 2013), as well as of floods, these factors are likely to have severe impacts on agriculture, human health and the potential for hydroelectric power generation in the region.

9.2.3 Impacts on Food

Africa relies heavily on agriculture, which contributes to about 21 percent of its GDP and approximately 50 percent of its total export value (IPCC 2013). Rain-fed farming dominates agricultural production in Sub-Saharan Africa, accounting for around 97 percent of total cropland, and exposes agricultural production to high seasonal rainfall variability (Calzadilla *et al.* 2013). Ringler (2009) points out that world food prices are important indicators of the effects of climate change on agriculture, food affordability and security, and the IPCC predicts that maize, rice, and wheat prices in 2050 are predicted to be 4, 7, and 15 percent higher than in the historic climate scenario. Impacts of higher food prices on people of the hotspot region will be substantial, depressing food demand in the longer term and increasing childhood malnutrition rates (IPCC 2013).

9.2.4 Impacts on Health

Shifts in the distribution of vector-borne diseases such as malaria, Rift Valley fever, African trypanosomiasis (sleeping sickness), yellow-fever and the almost eradicated onchocerciasis are expected (ECOWAS-SWAC/OECD 2008), as rainfall, temperature and temperature regimes shift and humans and animals migrate across the region.

9.2.5 Impacts on Human Migration

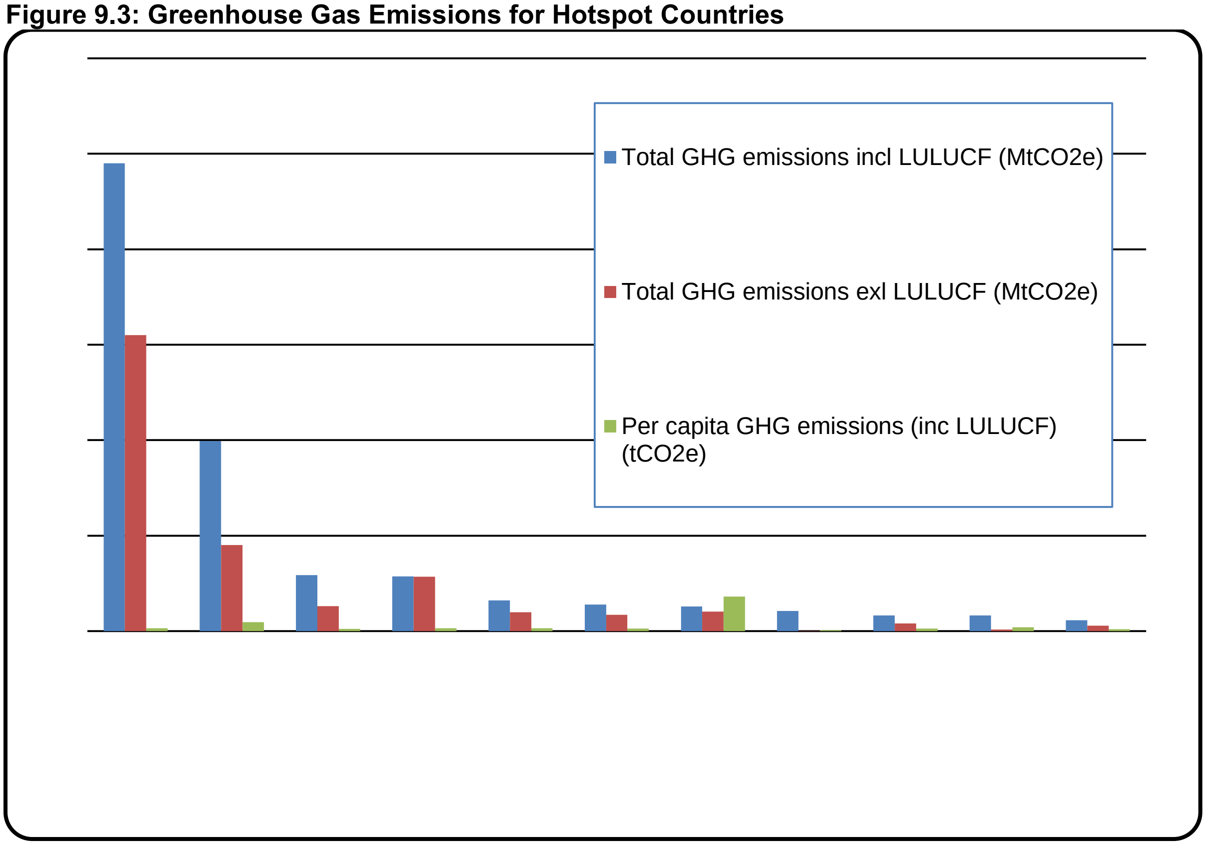
Climate change-driven human migration is likely to occur at scales ranging from local to international. While West African patterns are difficult to predict, a broad pattern of migration from northern to southern areas has been observed in the recent past, owing to the development of cash crops and urbanization in coastal areas and degradation of the natural environment in the Sahelian areas, and as a response to the need to seek economic opportunities, diversify risk and reduce poverty (Bossard 2009). This migration, which results in displacement of northern groups, and particularly from the Sahel, may increase in future due to climate change impacts on agriculture, which are expected to be particularly severe in these more northern regions (USAID 2013).

9.3 Responses to Climate Change

9.3.1 Contribution of the Guinean Forest Hotspot Countries to Global Climate Change

In 2010, the 11 hotspot countries emitted only 2.03 percent of global greenhouse gas (GHG) emissions, including consideration of the land use, land use change and forestry (LULUCF) sector (WRI 2013). Nigeria and Cameroon emitted substantially more GHGs than the other hotspot countries but Equatorial Guinea had the highest per capita GHG emissions (Figure 9.3).

Figure 9.3: Greenhouse Gas Emissions for Hotspot Countries



Source: Climate Analysis Indicators Tool (CAIT 2.0) (WRI, 2013).

At present, the hotspot countries are relatively undeveloped but their GHG emissions will likely increase substantially with economic development, unless 'green', low carbon pathways to development are successfully promoted. Preliminary research by WRI (2013) suggests that net forest conversion (including the LULUCF sector) is the most significant source of emissions in all hotspot countries, including those most industrialized, with the exceptions of Côte d'Ivoire and Guinea, where agricultural emissions dominate. Agricultural and energy related emissions form the next two largest sectors (WRI 2013). Overall, 42 percent of the hotspot countries' emissions are from land use change (including deforestation and degradation), compared to approximately 22 percent for Africa as a whole (WRI 2013).

9.3.2 International Agreements and National Frameworks focusing on Climate Change

There has been a clear expansion of climate change mitigation initiatives in the region since the last CEPF investment period. All eleven hotspot countries have ratified the UNFCCC and the Kyoto Protocol. All except Equatorial Guinea have produced their first National Communications in response to their UNFCCC commitments, and most have developed National Adaptation Programmes of Action (NAPAs) or other adaptation strategies (see Table 9.4).

Table 9.4 International and National Agreements and Strategies Relating to Climate Change in Hotspot Countries

Country	Year of UNFCCC Ratification	Year of Kyoto Protocol Ratification	Year(s) of National Communi-cations	National Adaptation Programme of Action (NAPAs) / National Adaptation Plan (NAPs)
Benin	1994	2002	2002; 2011	Programme d'action national d'adaptation aux changements climatiques du Bénin (PANA-BENIN), 2008. Currently developing NAP.
Cameroon	1994	2002	2005	Preparing through UNDP 'Supporting Integrated and Comprehensive Approaches To Climate Change Adaptation in Africa' project.
Côte d'Ivoire	1994	2007	2001; 2010	No NAPA submitted to UNFCC.
Equatorial Guinea	2000	2000		Plan de acción nacional de adaptación al cambio climático (PANA), 2013.
Ghana	1995	2003	2001; 2011	No NAPA (not LDC). National Climate Change Adaptation Strategy (NCCAS) released in 2012.
Guinea	1993	2000	2002	Plan d'action national d'adaptation aux changements climatiques (PANA) de la République de Guinée, 2007
Liberia	2002	2002	2013	National adaptation programme of action (NAPA), 2007. Currently developing NAP.
Nigeria	1994	2004	2003	No NAPA. National Adaptation Strategy and Plan of Action (NASPA) process initiated by NGOs and finished in 2011.
São Tomé and Príncipe	1999	2008	2005; 2012	National Adaptation Programme of Action on Climate Change, 2007.
Sierra Leone	1995	2006	2007; 2012	National Adaptation Programme of Action of Sierra Leone, 2008.
Togo	1995	2004	2001; 2011	Plan d'action national d'adaptation aux changements climatiques (PANA), 2009.

Notes: LDC = Least Developed County; NAP = National Adaptation Plan; NAPA = National Adaptation Program of Action; NASPA = National Adaptation Strategy and Plan of Action; NCCAS = National Climate Change Adaptation Strategy; PANA = National Action Plan for Adaptation to Climate Change.

All hotspot countries are establishing or have established climate change related institutional and policy frameworks including national steering committees or departments and climate change policies.

9.3.3 Mitigation Initiatives

The hotspot countries' commitments to international and national agreements and strategies have enabled increased access to a growing stream of climate change related funding for mitigation, including under the Clean Development Mechanism (CDM) and REDD+ initiatives.

REDD+

Nine of the 11 hotspot countries are now developing REDD+ initiatives. The main climate and REDD+ programmes involved in the hotspot are described in the following sections.

The UN-REDD Program

This is the United Nations' collaborative initiative on REDD+ in developing countries, and involves UNDP, UNEP and FAO. It supports nationally-led REDD+ processes and REDD+ readiness efforts in 56 partner countries. This is mainly through direct support to the design and implementation of UN-REDD National Programs, and complementary support to national REDD+ action through common approaches, analyses, methodologies, tools, data and best practices. Among hotspot countries, Nigeria has a national programme, while Benin, Cameroon, Côte d'Ivoire and Ghana are also collaborating with the program (see FAO, UNDP and UNEP 2015).

The Forest Carbon Partnership Facility (FCPF)

This initiative is implemented by the World Bank, and is a global partnership of governments, businesses, civil society, and Indigenous Peoples aiming to provide financial and technical assistance for countries' REDD+ programmes. Its complementary funding mechanisms are the Readiness Fund and the Carbon Fund. Forty-seven developing countries have been selected to join the FCPF and have signed the Participation Agreement. In the hotspot, these include Cameroon, Côte d'Ivoire, Ghana, Liberia, Nigeria and Togo (see FCPF 2015).

Global Climate Change Alliance (GCCA)

The GCCA has a program covering all 79 member countries of the African, Caribbean and Pacific group of states and supports member countries, in particular Least Developed Countries and Small Island Developing States, in their adaptation and mitigation responses. It includes a pan-African component to support the ClimDev Africa programme, and four regional components in Eastern and Southern Africa, Western Africa, the Caribbean and Pacific. Activities in the West Africa/ECOWAS component include monitoring in the Sahel, enhanced participation in CDM and other funds, and national projects Benin, São Tomé and Príncipe, and Sierra Leone.

The Government of Norway's International Climate and Forest Initiative, the UK International Climate Fund/Forest Governance, Markets and Climate Programme (FGMC) and the development banks' Climate Investment Funds (CIF) are also supporting REDD+ capacity building and other climate mitigation and adaptation activities in the hotspot. For example, Norway announced a bilateral agreement in September 2014 to provide around USD 150 million to support Liberia to reduce GHG emissions linked to deforestation (Government of Norway 2015).

A summary of each hotspot country's participation in REDD+ activities is listed in Appendix 10. Five countries, namely Benin, Cameroon, Côte d'Ivoire, Ghana and Nigeria, are active UN-REDD partners, while Equatorial Guinea is likely to become a member in the near future. Six countries (Côte d'Ivoire, Ghana, Togo, Liberia, Cameroon and Nigeria) are accepted FCPF members. Most hotspot countries also have a number of other REDD+ initiatives supported by the GCCA, FCMC and CIF, as well as by a range of other independent national and non-governmental organizations. Countries with notably poor REDD participation are São Tomé and Príncipe, and Equatorial Guinea.

In addition, there are a number of REDD+ projects under development by NGOs and others in the hotspot, such as in Sierra Leone (Gola Forest), Cameroon (Korup National Park) and Nigeria. Nigeria's Cross River State is currently involved in three REDD+ pilot projects, including one targeting 58,000 hectares of mangroves (Oyebo *et al.* 2010). These mangroves are considered to be richer in biodiversity than those elsewhere in West Africa. Given this species richness and Nigeria's possession of the largest expanse of mangrove forest in Africa (and the third largest in the world), the country is strongly promoting the importance of mangroves in REDD+.

It should be remember that, as with all ecosystem-service based mechanisms, REDD+ and other forms of carbon financing depend upon the market price for the service. If the market price for carbon falls, projects may need to seek alternative sources of funding to cover operational costs and meet local communities' expectations for benefit sharing. There is a need, therefore, for diversified funding strategies for forest conservation that do not rely too heavily on a single source. In the context of the ecosystem profile, there may be a need for adaptive management with regard to geographic priorities for CEPF investment, if important sites currently considered to be adequately resourced turnout to be facing funding shortfalls.

The Clean Development Mechanism (CDM)

While REDD+ has received relatively large amounts of investment and attention in the region, CDM projects, which focus on helping to develop low-emissions solutions to energy needs, have received little support. Most of the CDM projects that are occurring in the hotspot are located in Nigeria, Côte d'Ivoire, Cameroon and Ghana. These projects focus mainly on capacity building for and initiatives relating to energy production (from landfills, waste and other biomass), waste composting, fuel substitution and efficient fuel-wood stoves. Investment in CDM initiatives, particularly in Equatorial Guinea, Guinea, Liberia, Togo and Benin, is a clear priority.

9.3.4 Adaptation Initiatives

Using hotspot countries' national adaptation programmes and plans, a table was compiled listing the key adaptation measures that stakeholders consulted from each country considered most important (see Table 9.5; note that the categories were defined by the authors). Measures listed most frequently included those focusing on coastal zone protection from sea level rise, agriculture and food security, disease and health management, early warning systems for extreme events (e.g., droughts, storms or floods), and water conservation and management. Education and awareness raising for climate change adaptation was also regarded as a high priority by stakeholders from the majority of countries. The identified adaptation needs provide an important foundation for discussing adaptation activities in the hotspot. Also apparent from Table 9.5 is the potential of many of the climate change adaptation measures to have significant positive and negative impacts on biodiversity. Examples of key climate change adaptation projects currently occurring in hotspot countries are shown in Appendix 10.

Table 9.5 Overview of Measures for Climate Change Adaptation Identified by Hotspot Countries in their NAPAs and Other Adaptation Strategies and Communications

Adaptation Measure	Benin	Cameroon	Côte d'Ivoire	Ghana	Guinea	Liberia	Nigeria	São Tomé & Príncipe	Sierra Leone	Togo	Total
Agroforestry					x						1
Agriculture/food security				x	x	x	x	x	x	x	7
Anti-disease/health measures	x			x		x	x	x	x	x	7
Coastal zone protection/SLR mitigation	x	x		x	x	x	x		x	x	8
Ecosystem management/ restoration					x			x	x		3
Education/awareness raising				x	x	x	x	x	x		6
Efficient stoves/fuel wood	x							x	x		3
Fire management/prevention					x						1
Fisheries management/enhancement					x	x	x	x	x		5
Flood control/mitigation				x							1
Forestry/protected areas/corridors							x		x		2
Indigenous/traditional knowledge					x						1
Income enhancement/ diversification/microfinance					x		x	x		x	4
Infrastructure							x	x			2
Renewable energy/energy efficiency	x						x	x	x		4
Rapid alert/early warning system	x			x		x	x	x	x	x	7
Water utilization/irrigation/dams	x		x	x			x	x	x	x	7
Water conservation/management/ wetlands			x	x	x	X	x	x	x		7
Water and sanitation					x	X	x		x		4
Source	NAPA 2008	Nat. comm	Nat. comm	NCCAS 2012	NAPA 2007	NAPA 2007	NASPA 2011	NAPA 2008	NAPA 2011	NAPA 2009	

Sources: NAPA = National Adaptation Programme of Action; Nat. comm. = National Communication to UNFCCC; NCCAS= National Climate Change Adaptation Strategy; NASPA= National Adaptation Strategy and Plan of Action
Notes: Classification of adaptation measures devised by profiling team. No NAPA, strategy or other relevant document was identified for Equatorial Guinea.

Ecosystem-based Adaptation

Ecosystem-based Adaptation has been defined as "the use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change" (Convention on Biological Diversity 2009). Many of the initiatives focusing on human adaptation to climate change in the region explicitly or implicitly refer to biodiversity, particularly those related to coastal zone protection, land degradation, vulnerability and impact assessment. More recently, however, programs have been attempting to comprehensively integrate ecosystem, social and economic aspects of climate change adaptation.

Examples of ecosystem-based adaptation and/or resilience activities being undertaken in the region include:

i. Mangrove ecosystem rehabilitation and conservation (e.g. the Building Mangrove Resilience to Climate Change project in the Douala-Edea, Ntem and Rio del Rey Estuaries in Cameroon);
ii. Community-focused projects in vulnerable coastal and agricultural areas (e.g. the Adaptation to Climate Change in Vulnerable Coastal Communities project in São Tomé and Príncipe);
iii. Projects aimed at protecting, restoring or enhancing forests for the purpose of both mitigation and adaptation (e.g.: REDD+ and the Nigerian National Council on Shelterbelt and Afforestation/national afforestation programme; CIFOR research on potential role of Ghana's modified 'taungya' system for adaptation (under the Tropical Forest and Climate Change Adaptation project, TroFCCA); and the Climate Change and Forests in the Congo Basin: Synergies between Adaptation and Mitigation (COBAM) project including Cameroon and Equatorial Guinea).

Some of the barriers to the integration of ecosystem-based adaptation, as noted by UNFCCC (2013) and Doswald *et al.* (2014), are prevalent in the hotspot. These include poor understanding among decision makers of ecosystem-based adaptation's distinctiveness from other approaches, a lack of case studies and an evidence base for the benefits associated with ecosystem-based adaptation, that climate change vulnerability assessments do not always integrate ecosystem considerations, and a lack of monitoring and evaluation measures to quantify ecosystem-based adaptation effectiveness.

Community-based Adaptation

Community-based adaptation is "a community-led process, based on communities' priorities, needs, knowledge, and capacities, which should empower people to plan for and cope with the impacts of climate change" (Reid *et al.* 2009). A distinction is often made between community-based adaptation and ecosystem-based adaptation approaches, although the synergies between them are considerable and important (Girot *et al.* 2012). Because community-based adaptation initiatives tend to be process rather than outcome driven, a range of possible adaptation measures, outcomes and benefits may result, including ecosystem-based adaptation measures.

Given its broad scope, there are numerous initiatives that can be identified as community-based adaptation in the hotspot. These include:

i. The Advancing Capacity for Climate Change Adaptation project, which includes community-led activities in coastal Nigeria, Cameroon, Ghana, and the Sahelian zone;
ii. Community-based activities under the COBAM project in Cameroon and Equatorial Guinea;
iii. CARE's Adaptation Learning Program for Africa, covering 40 communities across Ghana, Niger, Mozambique and Kenya.

Infrastructural and Hybrid Adaptation Approaches

Infrastructural approaches to climate change adaptation use hard-engineered infrastructure to respond to climate change impacts (e.g. reservoirs to retain freshwater, sea walls to mitigate sea level rise). Hybrid approaches combine hard-engineered infrastructure with ecosystem-based adaptation and/or other adaptation measures (e.g., the combination of sea walls and mangrove conservation to reduce the impacts of sea level rise and/or storm surges). Examples of infrastructural and hybrid approaches being implemented in the hotspot include:

i. Senegal River Basin Multi-Purpose Water Resources Development Project 2 and the Senegal River Basin Climate Change Resilience Development Project. These GEF-funded projects promote Integrated Water Resource Management as well as water resources development and dam management in the context of improving climate resilience.
ii. Development of agricultural and flood mitigation infrastructure in Benin's Ouémé Valley for increased productivity and resilience (funded by the AfDB)
iii. Promotion of sustainable and climate-resilient grid-based hydroelectric electricity in São Tomé and Principle (funded by GEF with UNDP as Implementing Agency), as well as the São Tomé: Adaptation to Climate Change project (funded by the GEF with the World Bank as Implementing Agency), which includes an early warning system, coastal protection works, and both community and ecosystem-based adaptation measures.

9.3.5 Capacity Building and Policy Support

The NAP process for Least Developed Country Parties, established at the UNFCCC 16th Conference of Parties (2010), requires them to identify their medium- and long-term adaptation needs. They are then required to develop and implement strategies and programs to address these needs, building upon their experience with NAPAs (UNFCCC 2014). In response, a NAP Global Support Programme was established and among its focal countries, Benin and Liberia are currently receiving assistance. Other examples of capacity building and policy support include UNDP assistance with the development of NAPAs and GEF projects to mainstream environment and natural disaster management in Sierra Leone, such as the $4 million full-sized GEF project implemented by UNDP, "Strengthening climate information and early warning systems in Africa for climate-resilient development and adaptation to climate change".

9.3.6 Monitoring the Impacts of Climate Change Initiatives to Develop an Evidence Base for Improving Interventions

Given the recent and unprecedented nature of climate change in the history of biodiversity conservation, it is important to recognize that many of the solutions and actions recommended in this document and implemented by the global community are tentative and of unproven efficacy. In such situations, a strategy of constantly reviewing the impacts, effectiveness and potential damage resulting from management actions, and consequently carrying out frequent and rapid updates to actions plans (i.e., adaptive management) is a sensible approach. There is a need for conservation practitioners and donors to recognize that, in this challenging fledgling field, unintended outcomes of conservation actions are likely and should be regarded not as failures but as lessons, providing valuable information that should be shared with the community and used to inform further steps.

In order to be able to review the effectiveness and potential negative impacts of actions plans, strategies to monitor and measure interventions outcomes are integral. These should be measured in ways that are as quantitative as possible, include indicators, and be as replicable and comparable as possible among initiatives. Development of a facility to record, analyze and share these outcomes and experiences is a priority for the region and in general, and guidance on this can be gained from the growing field of evidence-based conservation. Frequent re-evaluation of management strategies is essential, with provision to update them according to outcomes from the effectiveness evaluation.

9.4 The Role of Civil Society

The enormous challenge presented by climate change in the immediate and longer-term is likely to leave government resources and capacity overextended. Civil society has an essential role in supporting governments' work in the hotspot, and in filling the inevitable gaps in government strategies and outreach. Given the broad scope and rapid development of emerging climate change related issues, CSOs, particularly those operating at grassroots and subnational levels, are often under-resourced and face critical capacity constraints. Their current and potential roles in capacity building, policy development and roll-out and active management are often under-played. In particular, interorganization coordination, information exchange and capacity building are clear and important priorities for international donor support to civil society in the region.

A broad spectrum of CSOs operates in the hotspot, ranging from locally based programmes to international conservation organizations. Appendix 10 gives examples of some of the key local NGOs operating in the hotspot, and describes their geographic scope and foci, as related to climate change and to biodiversity.

Regarding international CSOs, as discussed in Chapter 7, most large international conservation organizations have programs in one or more of the hotspot countries, all of which include climate change concerns in conjunction with their ongoing work. Some international NGOs have programs that are more specifically focused on climate change. These include CI, whose work includes a low-carbon economy analysis for Liberia, involving an assessment of the climate change mitigation and economic implications of various policy scenarios. IUCN, UNEP-WCMC and other partners are implementing the Protected Areas Resilient to Climate Change project (PARCC; 2009-2015), which aims to enhance biodiversity conservation in West Africa's protected area network under climate change (including in Sierra Leone and Togo, with participation from Côte d'Ivoire and Ghana). The project includes distributing downscaled climate projections, carrying species-level assessment of most of the region's vertebrate species, developing spatially explicit conservation plans, compiling adaptation and risk reduction plans, capacity building and a pilot project. In addition, Wetlands International is developing a regional mangrove conservation plan with piloting of mangrove restoration actions. The project will promote multi-country agreement on subregional policies and plans for the sustainable management of mangrove forests. Moreover, BirdLife International hosts the African Climate Exchange website, which makes information related to climate change in Africa, including scientific, management and policy documents, broadly available for comment and exchange.

9.5 Conclusions

CEPF is in a position to engage with civil society to enhance climate change preparedness for biodiversity conservation in the hotspot. This can be achieved by improving informational resources for conservation-decision-making under climate change, such as climate change vulnerability assessments and carbon inventories. This can also be done by increasing the number and diversity of climate change adaptation initiatives for biodiversity, particularly in areas containing large numbers or high proportions of climate change vulnerable species. Because the hotspot includes forested areas that are inherently rich in species, few of its geographical regions contain low numbers of climate change vulnerable species. Even so, the combined inputs of studies across a range of taxonomic groups suggest that the main forest blocks in the Upper and Lower Guinean Forests subregions are of slightly higher priority relative to the savanna-forest mosaics of the intervening area.

Another important consideration for CEPF is to ensure that climate change related initiatives in the hotspot measure and report on their outcomes, including their effectiveness at meeting their objectives, any unintended consequences, and explanation of the reasons for these and lessons learned. Monitoring should also be based on context-specific indicators that measure changes in community resilience, biodiversity and ecosystem service provision (especially for ecosystem-based adaptation initiatives.

CEPF is also well placed to advance the national policy response to climate change by strengthening the capacity of CSOs to engage in formulation of public policy. In this way, CSOs can help governments develop national frameworks, policies and regulations for climate change mitigation and adaptation, such that they meet national needs for development, adaptation and environmental sustainability, as well as commitments to international agreements, and, in particular, promote positive synergies between climate change mitigation, adaptation and biodiversity conservation.

Climate change funding provides opportunities for sustaining conservation efforts for site and corridor outcomes. CEPF can support CSOs to leverage international funding for climate change mitigation and adaptation, including from the Climate Adaptation Fund, REDD+ readiness support programmes, and bilateral funding for REDD+, in support of conservation outcomes in the hotspot. This may involve working with investors from both within and outside the region, as well as forest communities and local governments, to increase private sector investment in projects through the voluntary carbon markets that seek environmental and social benefits, for instance through application of the Climate, Communities and Biodiversity (CCB) standards.

10. ASSESSMENT OF CURRENT CONSERVATION INVESTMENT

10.1 Introduction

This chapter contains an assessment of current conservation investment across the hotspot for the period 2009 to 2014. This includes funding for direct biodiversity conservation (species and ecosystem) initiatives, as well as for broader thematic investment, which, on investigation, appear to have some benefits or components relating to biodiversity conservation in the hotspot. Examples of the latter include initiatives addressing climate change, protected areas, poverty reduction/livelihoods, ecosystem services, and corridor and landscape management approaches. A total of 158 national and 24 regional (multiple country and trans-boundary) 'projects' (182 in total) were identified across the hotspot, representing a total conservation investment of USD 266 million over the five-year period to 2014. This total represents less than one percent of total official development assistance (ODA) to the 11 hotspot countries (of USD 28,441 million) for the five-year period up to 2013 (OECD Aid statistics: http://stats.oecd.org/qwids/ accessed April 2014). These 182 investments were analyzed to investigate levels of funding by country and by type of donor and project partner and to look at gaps, specifically in relation to priority KBAs.

A study of the policies and programs of major bilateral and multi-lateral donors in relation to funding for forests and forest-dependent communities (Speechly 2015) found that the element of ODA going from European donors to forest-related and biodiversity projects increased dramatically between 2002 and 2012 (totals for the period were USD 2.55 billion and USD 1.57 billion, respectively). Given that European donors invest heavily in African countries, it can be inferred that this trend was reflected in the hotspot countries. However, the report underlines the difficulty of separating out relevant information even for individual countries (let alone KBAs or areas within the hotspot boundary) and the significance (in terms of funding) of large thematic programs. For example, the Norwegian International Climate and Forest Initiative (NICFI), which alone accounted for USD 287 million in 2012, and made up for more than half of all donors' disbursements. The report also underlines the need for, and cost implications of, more detailed research, if specific information is required by country, site or theme. The trends identified in the report (of relevance to the hotspot) are discussed further under Section 10.5.1.

10.1.1 Methodology

Most of the funding allocated to conservation in KBAs and protected areas in the hotspot overall is provided by international donors. The approach taken for the Guinean Forests (as had been done previously for hotspots) was to obtain as much information as possible from projects and programs of relevance to the hotspot and/or for named KBAs (predominantly through literature and website review, supplemented by and cross-checked with information obtained during the stakeholder consultations during the profile preparation process and other information from

specific requests by the authors to donors or other relevant contacts). Each discrete investment by a donor was considered a 'projects' for the purposes of the quantitative analyses by source or donor type (Section 10.2) and by country (Section 10.3). Nevertheless, it was often not possible to identify funding specifically allocated for biodiversity conservation at particular KBAs (although a few KBAs receive grants entirely dedicated to biodiversity conservation).
In addition to this 'master list' of projects identified and compiled through regional consultations and extensive web-based and other research, additional information was also gleaned from donor websites on their wider funding priorities in the region. In most cases this was presented by the donor as thematic funding or totals for a certain region, country and time period (but not necessarily for the time period under review). It was rarely possible to distinguish hotspot or KBA-specific funding from these additional data but, where additional funding information that appeared relevant to the hotspot was available, it was included in the relevant tables. These figures were not added to the quantitative analyses presented in Sections 10.2 and 10.3, to avoid double counting of the same investments.

Projects were included in the master list and the quantitative analyses only if the investment amount was USD 50,000 or more. One implication of this was that the small grant programs of multilateral and bilateral donors (see Tables 10.2 and 10.3) and Trusts, Foundations and NGOs (see Tables 10.4 and 10.5) were not included in the overall quantitative analyses. Instead, these are considered separately in the relevant sections and tables. Although the funding levels are smaller, these small grants tend to be allocated predominantly or exclusively to civil society, so they are of particular relevance in helping to define a funding niche for CEPF in the hotspot.

A number of assumptions and estimations were made for the inclusion of projects in the analyses in Sections 10.2 and 10.3. Project funds were allocated *pro rata* across years where the investment years fell outside the 2009 to 2014 period, and were divided equally between relevant hotspot countries in the case of initiatives in more than one country. Efforts were made to mitigate the risk of double counting in relation to funding streams (e.g. bilateral funds disbursed through multilateral programs and international NGO funds derived from larger donors) but this risk could not be entirely removed. Figures on government cofinancing were excluded from most analyses because they are calculated and presented differently in different countries, donor budgets and reports and because they were considered typically to constitute in-kind contributions or sectoral investments not directly relevant to biodiversity conservation (see Section 10.4.1).

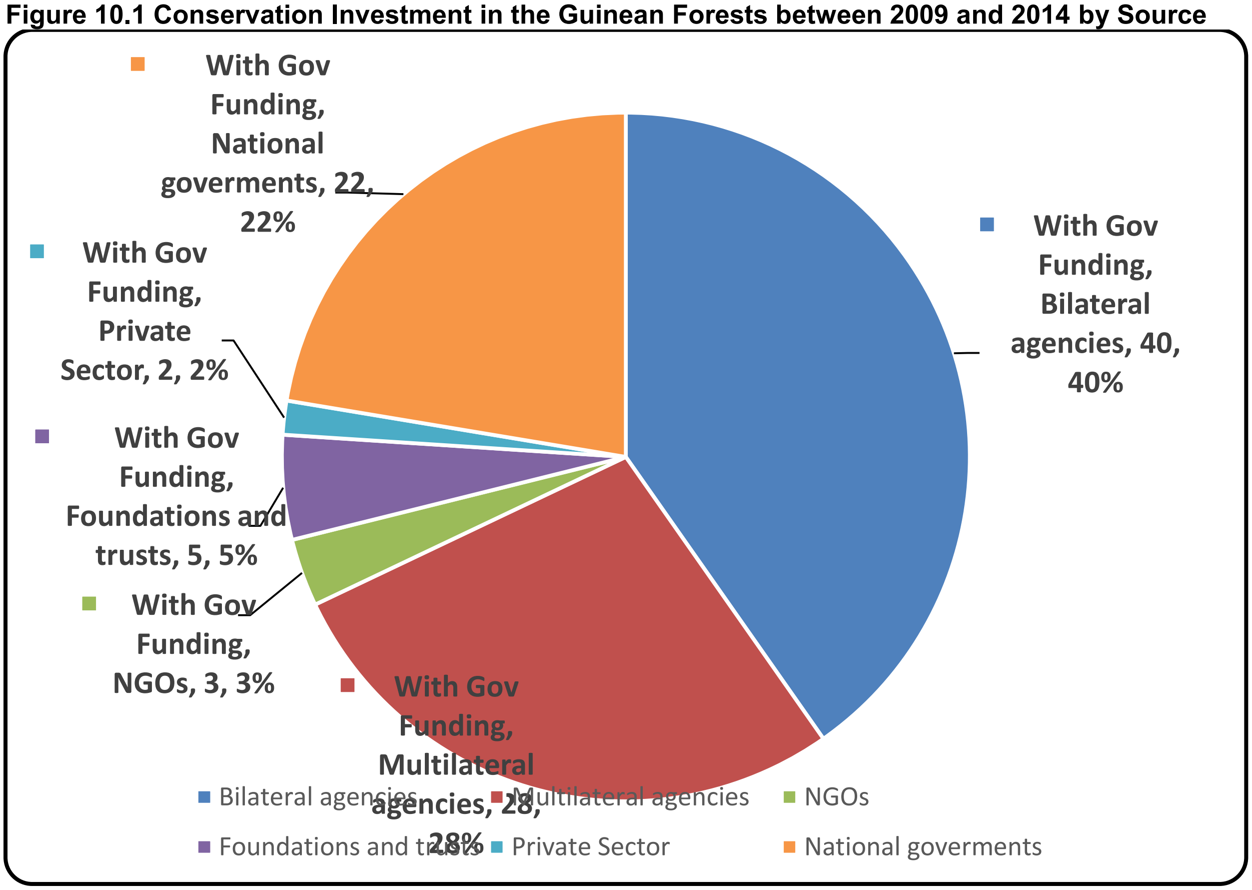
Questions asked during the subregional consultation meetings in relation to conservation funding provided some information on major projects for most hotspot countries (see Chapter 2 for detail of questions and consultations). However, planned follow-up meetings were cancelled due to the Ebola crisis and no new data on investments resulted from the regional questionnaires circulated in November 2014. Most data were obtained from donor web sites and published documents, followed up with specific enquiries to donors and grant recipients. A separate donors' meeting held in the region in November 2014 (US organizations, led by USFWS and including CEPF) provided some additional detail on investments and 'post-Ebola' plans for the Upper Guinean Forests subregion of the hotspot.

Information was included for coastal/ marine conservation and sustainable fisheries management, where it appeared likely to be relevant to specific KBAs, corridors or globally threatened species within the hotspot. Although efforts were made to track down as many relevant investments as possible, the ease of obtaining information from different donors varied greatly. Hence, the figures obtained are almost certainly under-estimates.

10.2 Major Sources of Conservation Investment in the Hotspot

Sources of conservation investment were divided into the following six categories: bilateral; multilateral; national government; NGOs; foundations and trusts; and private sector. Grants from bilateral and multilateral organizations are by far the largest contributor to conservation funding in the hotspot, accounting for two-thirds of the total (Figure 10.1). The different types of donor and the contributions of individual donors to conservation in the hotspot are considered in more detail in Section 10.4.

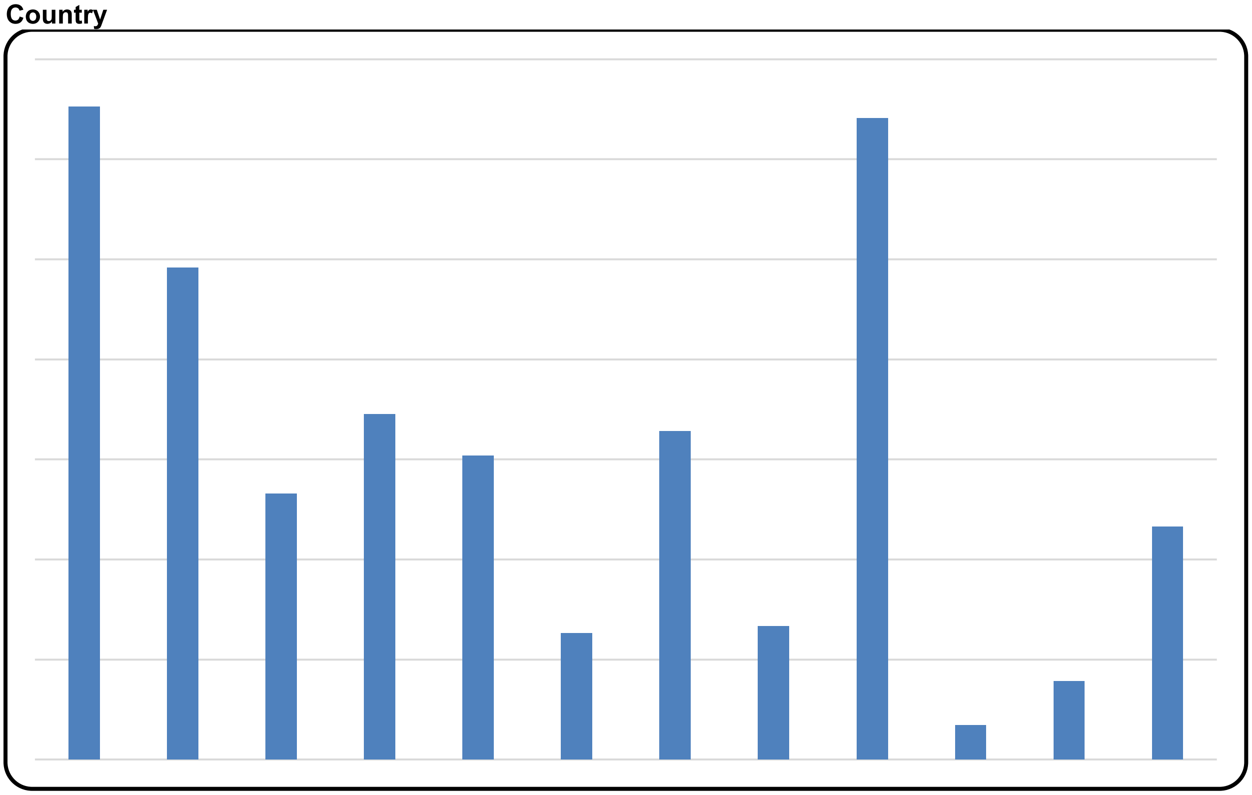
Figure 10.1 Conservation Investment in the Guinean Forests between 2009 and 2014 by Source



10.3 Distribution of Conservation Investment by Country

The breakdown of conservation investment between 2009-2014 by hotspot country is shown in Figure 10.2. The apparently high levels of funding (relative to the area of the hotspot in the country) in Benin (in particular) and also Sierra Leone are a consequence of including a few very large investments covering large areas (water basins and estuarine/coastal areas). These appeared to be of relevance to the conservation of KBAs in the hotspot and were, therefore, included. However, it was not possible to attribute the specific conservation relevance of such investments more accurately in the absence of detailed information on the locations and impacts of specific project activities. Hence, the inclusion of these projects may give a skewed impression of the relative levels of actual biodiversity conservation investment in the hotspot in these countries. Excluding these two countries, Côte d'Ivoire, Ghana and Liberia appear to receive the greatest total level of conservation investment, while Equatorial Guinea, São Tomé and Príncipe appear to receive the least.

Figure 10.2 Conservation Investment (in USD) in the Guinean Forests between 2009 and 2014 by Country



Note: 'RGNL' (regional) denotes investments covering two or more countries.

10.4 Distribution of Conservation Investment by Individual Donor

10.4.1 Governments

Within the constraints of the profiling process, it proved to be very difficult to obtain data on budget allocations for biodiversity conservation by hotspot country governments. Few relevant data are in the public domain and none were forthcoming from the stakeholder consultations. It would have required extensive consultation with relevant government agencies across the 11 countries to obtain this information, and, even then, it would have been difficult to determine which components of national programs or budget lines were relevant to conservation, or targeting areas within the hotspot boundary. This also applies to national strategies, such as NBSAPs and NAPAs, which are, in any case, frequently fully or partly funded by external donors or projects.

Many of international donors and programs list government 'co-funding' but, in many cases, this is not actual cash contributions to conservation, because many international donor projects, especially those funded by bilateral and multilateral donors, are incremental investments on top of sectoral loans for agriculture, forestry or fisheries development, which are tangentially related to biodiversity conservation at best. For example, initial data collected for Nigeria showed 'co-funding' of USD 284 million, mainly in the form of sectoral loans from the World Bank, against grants of USD 20 million. Other donor-funded programs relevant to the same area or theme may also be shown as 'co-funding', thereby raising the risk of double counting. The analysis of conservation investment in this chapter exclude government co-funding, except where it is clear that these are additional resources made available for conservation from government budgets. Table 10.1 presents some examples of government funding targeting conservation outcomes in the Lower Guinean Forests subregion.

Table 10.1 Government Investment in Conservation in the Lower Guinean Forests Subregion

Country	Focus of Investment	Annual Amount	Source
Cameroon	Protected area 1st grade (>100,000 hectares): Korup National Park; and Mount Cameroon National Park	FCFA 30 million (approx. USD 52,000)	Public Investment Budget
	Protected area 2nd grade (50,000 to 100,000 hectares): Banyang Mbo Sanctuary; and Takamanda National Park	FCFA 15 million (approx. USD 26,000)	Public Investment Budget
	Protected area 3rd grade (<50,000ha): Bakossi National Park	FCFA 10 million (approx. USD 17,000)	Public Investment Budget
	Protected area 1st grade: Limbé Zoological Garden	FCFA 30 million (approx. USD 52,000)	Public Investment Budget
Equatorial Guinea	INDEFOR-AP : management of 13 protected areas [not all of which are located in the hotspot]	USD 1 million	State Budget
São Tomé and Príncipe	National Parks Management Unit	USD 10,000	State Budget

Source: Interactive Atlas of Cameroon, MINFOF, 2011 and final consultation workshop, September 2015.

10.4.2 Multilateral Donors

The most significant single source of conservation investment in the region is the GEF, principally working through the three Implementing Agencies: UNDP; UNEP; and the World Bank. GEF Focal Areas relevant to conservation include Biodiversity, Climate Change, Land Degradation and Multi-Focal. Efforts were made to identify the biodiversity component of grants with a broader scope, and only include in the analyses the percentage of a total grant that appeared relevant to biodiversity conservation within the hotspot. Twenty-four full- and medium-sized GEF projects with a biodiversity conservation objective were implemented in the hotspot during the period under consideration, providing a total of USD 135 million in GEF grants (Appendix 11). Out of this total amount, an estimated USD 85.3 million was invested within the hotspot over the five-year period up to 2014. A further USD 10 million was invested over the same period through the GEF Small Grants Program (Table 10.2).

Global and regional multilateral development finance institutions (the AfDB, World Bank and others) finance numerous other programs (often through loans and other mechanisms), which have a primary focus on economic development focus, including large infrastructure projects and investments in the agriculture, fisheries and forestry sectors. While these investments carry obligations with regard to environmental standards and best practice, they do not typically have funding allocated directly to biodiversity conservation, other than where GEF grants provide incremental funding. For this reason, such investments were not included in the analyses, which focus on funding with a biodiversity conservation component and relevant to the hotspot (even if it was not possible in all instances to identify impacts on specific KBAs).

Table 10.2 Overview of Multilateral Donor Investments in Conservation in the Guinean Forests Hotspot between 2009 and 2014

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
GEF with the World Bank as Implementing Agency (see Appendix 11)	The majority of World Bank support to conservation investment in the hotspot is through GEF grant-funded projects with the World Bank as Implementing Agency and/or co-funder. The World Bank also provides grant-aid to non-GEF projects and many other forms of lending and co-finance, principally to governments. These are not included in the analyses as most have a primary economic development focus, not directly related to biodiversity. There were 18 World Bank initiatives related to conservation in the hotspot over the period of analysis, including projects supporting ecosystem-based land management in forests and forest-adjacent areas (Benin, Cameroon, Guinea, Liberia); support to protected areas management (Benin, Côte d'Ivoire, Liberia); coastal and marine biodiversity and fisheries (Benin, Ghana); erosion and basin management (Nigeria); biodiversity and wetlands (Sierra Leone) and climate change adaptation (São Tomé and Príncipe). Specific KBAs targeted include Parc National de Taï et Réserve de Faune du N'Zo KBA (CIV11), Parc National de Marahoué (CIV10), Parc National du Mont Sangbé (CIV13), Parc National du Mont Péko (CIV12) and Réserve Intégrale du Mont Nimba (CIV14) in Côte d'Ivoire; Sapo National Park (LBR14) in Liberia, Sierra Leone River Estuary (SLE5) and two freshwater KBAs in Sierra Leone, coastal and marine parts of several proposed corridors, and the whole of São Tomé and Príncipe.	52.0 million
GEF with UNDP as Implementing Agency (see Appendix 11)	GEF-UNDP supported 19 projects in hotspot countries: Benin (4); Côte d'Ivoire (2); Guinea (3); Equatorial Guinea (3); Liberia (3); Nigeria (1); Togo (3). Four of these form part of the GEF SPWA (Strategic Program for West Africa) – Sacred Forests and Protected Areas in Benin; the Niger Delta Biodiversity Project in Nigeria and Strengthening the national system of Protected Areas in Togo. A specific rehabilitation project targets Parc National de Taï et Réserve de Faune du N'Zo KBA (CIV11) in Côte d'Ivoire and two projects in Equatorial Guinea also focus on KBAs, including Parque Nacional del Pico de Basilé (GNQ3). All projects have a biodiversity conservation focus; several also have components dealing with climate change adaptation, resilience and ecosystems, including fresh water and coastal zones in Benin, Guinea, Equatorial Guinea and Liberia. UNDP is also under-taking a coastal biodiversity sensitivity mapping exercise in Sierra Leone, with technical support from Wetlands International, which could inform subsequent investments in coastal conservation in that country or regionally. These include a USD 10 million project entitled "Adapting to climate change induced coastal risks in Sierra Leone", currently under development, which is projected to run from 2017 to 2021.	29.3 million

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
GEF with UNEP as Implementing Agency (see Appendix 11)	The project "Evolution of Protected Area Systems with Regard to Climate Change in the West Africa Region" (PARCC West Africa) is a Full-size GEF-UNEP project (2010-2015) with a focus on climate change and protected areas, managed by UNEP World Conservation Monitoring Centre (UNEP-WCMC). The total budget is USD 15.6 million, which consists of USD 3.5 million from GEF and partner co-financing of USD 12.1 million. The geographic scope of the project covers five core countries in West Africa, only two of which (Sierra Leone and Togo) are in the hotspot. An additional three countries are involved in activities relating to trans-boundary conservation, including two hotspot countries (Côte d'Ivoire and Ghana). While not included period of analysis, a second GEF/ UNEP project: "Conservation des Ressources Naturelles" (CORENA) will provide USD 5.9 million from 2015 onwards for national parks in Côte d'Ivoire, including the KBAs Parc National d'Azagny (CIV9) and Parc National du Mont Sangbé (CIV13). UNEP also supports the Great Apes Survival Partnership (GRASP) which supports work to conserve chimpanzees and gorillas in the hotspot, focusing on illegal trade, habitat loss, disease, trans-boundary issues.	1.2 million
GEF with the AfDB as Implementing Agency (see Appendix 11)	The AfDB is a GEF Implementing Agency for the project: "Integrated Development for Increased Rural Climate Resilience in the Niger Basin" in: Guinea, Côte d'Ivoire, Benin, Cameroon and Nigeria, plus four other countries outside the hotspot.	2.7 million
GEF Small Grants	The GEF Small Grants Program (GEF-SGP) is administered by UNDP and provides financial and technical support to communities and CSOs to meet the overall objective of "global environmental benefits secured through community-based initiatives and actions". Grants are provided up to a maximum of USD 50,000, (average USD 20,000 to USD 25,000). All countries in the hotspot, apart from Equatorial Guinea and São Tomé and Príncipe, received GEF Small Grants over the period of analysis. In descending order of total value of grants for biodiversity (with total number of biodiversity projects in brackets), the hotspot countries received: Ghana: USD 2.27 million (111); Côte d'Ivoire: USD 1.74 million (94); Liberia: USD 1.27 million (45); Cameroon: USD 1.21 million (53); Nigeria: USD 1.00 million (34); Togo: USD 0.86 million (33); Benin: USD 0.72 million (23); Sierra Leone: USD 0.48 million (17); Guinea: USD 0.43 million (13).	10 million
FAO/IFAD	The Rome-based UN agencies, Food and Agriculture Organization (FAO) and International Fund for Agricultural Development (IFAD) have a remit for technical assistance, reducing rural poverty and increasing productivity and sustainability of agriculture, forestry, fisheries and natural resource management. In West and Central Africa the focus is more on drylands and agriculture (than forests). Co-funding and/ or technical assistance is provided to three GEF projects of biodiversity relevance in the hotspot: "Development of a Trans-frontier conservation area linking forest reserves and protected areas in Ghana and Cote d'Ivoire" and two projects in Guinea: "Coastal, Marine Biodiversity Management" and "Community-Based Land Management Project" (selected subcatchments).	3.7 million as co-funding to to GEF projects
African Development Bank	The AfDB is a regional, multilateral development finance institution established to contribute to the economic development and social progress of African countries. Most investments are for economic purposes, infrastructure projects etc., but the following initiatives in the hotspot have some element of biodiversity conservation impact: the AfDB is a co-funder (USD 1.7 million - with FFEM and others) in the project "Gestion durable des forets communales du Bénin".	1.7 million

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
CEPF	CEPF first invested in the Guinean Forests of West Africa hotspot in 2001-2006, a five-year investment phase of USD 6.2 million, focused exclusively on the Upper Guinean Forests subregion. A follow-up phase of this investment (to 2012) overlapped with the period of analysis. Six projects (mostly follow-ons from the initial investment phase) were funded in five hotspot countries: Liberia, Ghana, Côte d'Ivoire, Sierra Leone and Guinea through recipients: BirdLife International, Arizona State University; IUCN; Conservation International, Environmental Foundation for Africa, FFI, RSPB. Activities included NGO and government capacity building, research, conservation action and community livelihoods focussed on various KBAs, including Ankasa Resource Reserve - Nini-Sushien National Park (GHA2), Bia National Park and Resource Reserve (GHA4), Kakum National Park - Assin Attandaso Resource Reserve (GHA15), Tano-Offin Forest Reserve (GHA29), Gola Forest Reserve (SLE1), Tiwai Island Game Sanctuary / Non-hunting Forest Reserve (SLE7) and Monts Nimba (GIN9), as well as Liberia's national protected area system.	1.9 million

GEF-6 and country indicative allocations under the System for Transparent Allocation of Resources (STAR) are currently being agreed. The total West and Central Africa regional allocation of USD 83.9 million under GEF-6 represents a 22 percent increase from GEF-5. There is an increased number and variety of GEF Implementing Agencies and partnerships in addition to World Bank and UN agencies. Recent additions to the list of GEF Implementing Agencies include three international NGOs working in the hotspot region: Conservation International, IUCN and WWF (US).

10.4.3 Bilateral Donors

Many bilateral donors have a focus on conservation funding in the hotspot and most donor governments identify priority countries for their investment as well as broad themes, such as climate change adaptation and mitigation (often with subcomponents including biodiversity, ecosystem services, forest management, or people and livelihoods). Many donor countries have development finance institutions, whose focus is more on economic development, enterprise and trade, while an overseas development agency provides funding for themes such as forest conservation and natural resource management. However, there is considerable overlap, for example in relation to poverty reduction and achievement of the MDGs. Most European bilateral donors justify ODA in relation to forests, in terms of the contribution that forests make to the broader goals of poverty reduction, enhancing sustainable trade, strengthening governance and mitigating climate change. The most significant bilateral funders of conservation initiatives in the region are the EU and France (Table 10.3). With the exceptions of the EU, France, Germany and the USA, few countries have specific overseas biodiversity strategies and it is hard to disaggregate investment in conservation from other investment (and even more so investments in specific KBAs or corridors).

The EU Global Public Goods and Challenges (GPGC) fund is largely dedicated to environment (climate change, water, forests) and is structured under flagship initiatives, including Biodiversity for LIFE (B4L). This is "an ecosystem-based approach for economic growth, climate change mitigation and adaptation, food security and good governance", under which funding for biodiversity in developing countries will be doubled. The four elements of B4L are good governance; ecosystem conservation for food security and rural development; green economy; and the Wildlife Crisis Window. It will be funded under various EU instruments including the European Development Fund and may be supported in the longer-term through an EU Trust Fund. Approximately USD 900 million is allocated for biodiversity protection, with biodiversity as a subsidiary target (for mainstreaming) in other programs. More funding is budgeted for West Africa than for any of the other regions (Central Africa, East and Southern Africa, the Caribbean or the Pacific). The B4L facility will have a budget of 3 million Euros to be launched in October/November 2015. The EU African Wildlife Conservation Strategy is likely to be a major implementation mechanism for B4L (from 2016 onwards), with a particular focus on wildlife crime and trafficking, conservation of key sites (protected areas) and "Key Landscapes for Conservation" (KLCs), threats from bushmeat and fuelwood harvesting, transfrontier conservation areas (TFCA), and particular species groups (elephants, birds, primates, carnivores, plants). It is not yet clear how KLCs relate to the KBAs and conservation corridors defined in this ecosystem profile.

Table 10.3 Overview of Bilateral Donor Investments in Conservation in the Guinean Forests Hotspot between 2009 and 2014

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
EU	Most EU funding to hotspot countries is provided through multi-donor funded projects, in collaboration with the GEF, UN agencies, European bilateral donors and NGOs. Beneficiary countries in the hotspot comprise Benin, Côte d'Ivoire, Ghana, Equatorial Guinea, Liberia, Sierra Leone and Togo. Contributing programs/ funds include the EU Program on Tropical Forests and other forests in Developing Countries and the EU Thematic Program for Environment and Sustainable Management of Natural Resources including Energy (ENRTP). Themes for support include sustainable forest management and Protected Areas (including nation-wide protected areas and capacity building projects in Côte d'Ivoire, Ghana, Equatorial Guinea and Togo). Benin has received over USD 10 million for widespread projects relating to conservation of gallery forests, faunal reserves and community reserves. Liberia and Sierra Leone have received grants of more than USD 8 million (through BirdLife International and RSPB) for work in Gola Forest Reserve (SLE1) under the following projects "Securing Liberian forest connectivity through community forest management and innovative financing mechanisms" (GolaMA); "Across the River – a trans-boundary peace park for Sierra Leone and Liberia" (ARTPP); and "The Gola Forest- a new practical model for achieving sustainable protected areas in post-conflict Sierra Leone". Another KBA in Sierra Leone, Western Area Peninsula Non-hunting Forest Reserve (SLE8), received USD 3 million in EU funding through a partnership with Deutsche Welthungerhilfe E.v. for the project: "Western Area Peninsula Forest Reserve and its Watershed" (see Table 10.4). The EU is also a partner (EU-Joint Research Committee) and donor in the regional BIOPAMA project under the 10th European Development Fund (to African, Caribbean and Pacific Developing Countries), which is listed under IUCN's entry in Table 10.5.	30 million

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
France / AFD and FFEM	France was the fourth largest contributor worldwide to ODA (behind USA, Germany and UK) in 2012. Sub-Saharan Africa is France's main priority region and two-thirds of AFD grants are allocated to 16 countries suffering from poverty; these include Benin, Ghana, Guinea and Togo. Guinea is also a special category for funding (countries in or recently emerged from conflict) and received additional support for Ebola treatment centres in 2014. France and Germany are the only European countries with a bilateral biodiversity strategy. France's AFD biodiversity strategy focus for 2013-16 includes sustainable management and protection of ecosystems, with specific sectors: forestry, fisheries and protected areas. Under the special France-IUCN Framework Agreement, a roadmap was created in 2011 to strengthen the network of protected areas in West and Central Africa; this now forms the basis for work of a range of partners (governments, NGOs, donors (GEF, EU, KfW, AFD). The third phase (2013-2016) will focus on: 1. Strengthening the network of Protected Areas in Africa. 2. Preserving oceans and valuing their resources. 3. Biodiversity governance. FFEM is a bilateral fund, established following the Earth Summit in Rio, for the promotion of innovations in the global environment; it contributes to sustainable development projects through grants. FFEM's focal areas of action are the preservation of biodiversity and international waters, the fight against climate change and against persistent organic pollutants (POPs), land degradation, desertification and deforestation. Although a bilateral fund, FFEM projects are usually integrated with funding from other bi- and multilateral donors (including AFD) and implemented through partnerships. Major investments by FFEM in the hotspot include support to management of community forests in Benin, conservation of Sapo National Park (LBR14), protection of Gola Forest Reserve (SLE1) and community-based conservation of protected areas in Western Region of Ghana. Regional investments include a major initiative on capacity building and access to remote sensing data for forest monitoring in Central and West Africa. FFEM has funded a Small Grants program of support to southern NGOs, principally in Francophone Africa, since 2006 (le Program de Petites Initiatives or PPI). The objectives of support to civil society are to facilitate action on the ground; to increase capacity for project preparation, management and monitoring; the ability to influence national environmental decision-making and learning lessons. Projects are funded for a maximum of two years with average grants of EUR 34,000. The French Committee for IUCN coordinates the program with technical support from IUCN-PACO in West Africa. Themes include conservation of endangered species and ecosystems; protected areas; sustainable natural resource use and community forestry; animal-human conflicts; ecotourism; environmental education; and climate change. In the hotspot, the main beneficiary countries are Benin and Cameroon (10+ projects each); Ghana and Togo (3) and Liberia, Nigeria, São Tomé and Príncipe, and Togo all have one or two. Over the period of analysis, projects in the hotspot have received USD 1.7 million through PPI. Although grants are small, many target regions and key species within the hotspot, as well as specific KBAs, such as Bosomtwe Range Forest Reserve (GHA7), Amansuri wetland (GHA1), Mount Oku (CMR15), Lake Nokoué (BEN1), Sierra Leone River Estuary (SLE5) and Wonegizi mountains (LBR17).	24.0 million

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
Germany/ Federal Ministry for Economic Cooperation and Development (BMZ) through German Agency for International Cooperation (GIZ) and KfW Development Bank (KfW)	Germany's bilateral biodiversity strategy includes: mainstreaming biodiversity across government and society; reducing direct pressures on biodiversity and promoting sustainable use; improving the status of biodiversity by safeguarding ecosystems, species and genetic diversity; and enhancing the benefits to all from biodiversity and ecosystem services. There is also support to knowledge management and capacity building (including NBSAPs). Support to Benin is provided under two projects: "Gestion durable des forets communales du Bénin" (GIZ) and "Support to the Protected Areas Management Project" (KfW). In Côte d'Ivoire, there are also two major projects supported by Germany: "Protected Areas Management Project" (PCGAP) and "Améliorer la conservation de la biodiversité dans l'espace Taï" (both GIZ/KfW). In Cameroon, the "Supporting the implementation of the National Forestry and Environmental Program" (ProPSFE), includes a component: "Contribution to sustainable management of protected areas", which focuses on preserving high-value ecosystems and to improving living conditions for the population of the villages bordering the National Parks in the Southwest Region (GIZ/KFW). Also in Cameroon, the Program for the Sustainable Management of Natural Resources (GTZ/ DED/ KfW and MINFOF), includes support to the following KBAs: Banyang Mbo Wildlife Sanctuary (CMR4), Korup National Park (CMR5) and Mount Cameroon and Mokoko-Onge (CMR12). GIZ also manages the Access and Benefit Sharing component of the regional Biodiversity and Protected Areas Management Program (BIOPAMA). Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety has also established an International Climate Initiative (IKI) which finances climate and biodiversity projects in developing countries in four areas: Climate change mitigation; Adaptation to the effects of Climate Change; Conservation of natural Carbon sinks with a focus on REDD+; Conservation of biological diversity.	30 million
Japan/ JICA	Bilateral development assistance from Japan in the hotspot countries is directed towards health, education, disaster relief, rural and urban development and infrastructure projects, with some support to agricultural development (e.g. rice). There is some involvement from JICA in investments in forest projects in Cameroon (sustainable livelihoods and natural resource management) but not in areas of the country within the hotspot. In Côte d'Ivoire and Ghana there is a focus on national forest resource management. In Côte d'Ivoire the "Project for Rehabilitation and Restoration of Forests with the involvement of Local Communities" is funded jointly by JICA and ITTO (May 2013 - present). The project is implemented by Côte d'Ivoire's Forest Development Corporation (Société de Développement des Forêts, or SODEFOR) with the involvement of displaced people and local communities (following successive conflicts between 2002 and 2011). It includes rehabilitation of degraded forest lands through the establishment of taungya agroforestry plantations, other forest rehabilitation work with local communities and support to agroforestry and marketing in or near the hotspot but does not appear to target KBAs in the country. Prior to the period of analysis, the Participatory Forest Resource Management Project in the Transitional Zone (PAFORM) Project was also supported by JICA in Ghana from 2004 to 2009, with a total grant of JPY 460 million. However, this project does not appear to have directly funded biodiversity conservation activities within the hotspot. JICA is supporting climate change adaptation projects in the domains of agriculture, water, forests and energy in São Tomé and Príncipe.	1.8 million
Belgium/ Belgian Ministry for Development Cooperation	Belgium has a country focus on Benin, but thematic areas are predominantly agriculture (cotton and rice), health and decentralization. The Walloon Agency for Air and Climate contributes to an EU initiative for resilient agriculture and sustainable development in the Porto-Novo region, containing Lake Nokoué KBA (BEN1).	No specific biodiversity funding identified in the hotspot

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
Denmark/ DANIDA	The only country in the hotspot for which DANIDA has a country policy is Ghana (Denmark-Ghana Partnership Policy 2014-18). This contributes to specific biodiversity objectives under Ghana's Shared Growth and Development Agenda (Agriculture and Natural Resources) for example: "Manage biodiversity; Manage Protected Areas; Manage Land and Restore Degraded Forests; Promote integrated Marine and Coastal management; Ensure sustainable use of Wetlands and Water Resources; Enhance Community Participation in Natural Resource management; Mitigate impacts of Climate Variability and Change." but levels of funding directed at biodiversity or the hotspot are not identifiable. (Total ODA to Ghana, 2011: 400M DKK)	No specific biodiversity funding identified in the hotspot
Finland/ FINNIDA	FINNIDA supports eight focal countries in the hotspot: Benin, Cameroon, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone, predominantly in the areas of human rights, peace-building, democracy and development. Another area is sustainable management of natural resources and environmental protection. No information specifically for the hotspot; project themes of potential relevance include forest and timber resources, sustainable use and climate (Guinea); environment and livelihoods (Sierra Leone); food security and climate change adaptation (Benin, Cameroon, Ghana).	No specific biodiversity funding identified in the hotspot
Norway/ NORAD	NORAD has an overarching goal of sustainable development and poverty reduction and two focal countries (Ghana and Liberia) in the hotspot. The Norwegian Climate and Forest Initiative (NICFI) aims to develop a new international climate regime, reduce greenhouse gas emissions and promote the conservation of natural forests to maintain their carbon storage capacity. It has an integrated strategic component: "The Norwegian Climate and Forest funding to civil society" which funds actors working for increased knowledge and innovative solutions for reduced deforestation and forest degradation (to drive forward REDD+). Beneficiaries include vulnerable social groups, indigenous communities, local societies and civil society "living in and of the forest". A total of 11 "Sustainable landscapes and REDD+" thematic projects were allocated for civil society in hotspot countries in the 2013-2015 NORAD Guide to thematic areas: Liberia (one project: NOK 3.2 million); Ghana (three projects: NOK 3.1 million); Nigeria (one project: NOK 100,000); Cameroon (six projects: NOK 3.3 million), although none of these are known to have an explicit focus on biodiversity conservation in the hotspot. It is also important to note that investments in Cameroon were likely directed to the Congo Basin rather than the Guinean Forests. Liberia is also an eligible country for the five-year phase 2016-2020 Climate and Forest funding to civil society (including indigenous and other forest-dependent populations' rights and interests; conservation, sustainable management of forests and enhancement of forest carbon stocks (NOK 4 to 20 million annual budget per project).	No specific biodiversity funding identified in the hotspot
Spain	Support from the Spanish government and UNESCO to the Ghanaian Council for Scientific and Industrial Research (CSIR) for sustainable management of Lake Bosomtwe, Ashanti Region, and for the development of sustainable livelihoods, sustainable agricultural improvements, soil management, water quality and monitoring.	1.6 million
Sweden/ SIDA	Sweden has a long-term development cooperation agreement with Liberia and previously had the same in Sierra Leone (terminated in December 2012). Priorities are democratic governance, human rights, agricultural development (and trade). With the USA, Sweden supports Liberia's New Deal (support to post-conflict countries). SIDA supported the Gola Forest Trans-boundary Peace Park from 2009-2012, linking Gola Forest Reserve KBA (SLE1) in Sierra Leone and Lofa-Mano Complex KBA (LBR11) in Liberia). Support was based on the importance of the trans-boundary Gola Forest for ecosystem services (water and soils) for adjacent communities and climate change mitigation. SIDA also contributes to the WWF Coastal forests program supporting Bakossi National Park in Cameroon (see Table 10.5).	No specific biodiversity funding identified in the hotspot

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
UK/ Department for International Development (DFID) and Department of Environment, Food and Rural Affairs (DEFRA)	British development assistance in the hotspot region principally targets Anglophone countries (Ghana, Nigeria and Sierra Leone) with historic ties to the UK, principally through programs supporting peace, governance, women and girls, health, education, poverty and vulnerability. The Darwin Initiative (through DfID and DEFRA) is a UK government grant scheme that helps protect biodiversity and the natural environment through locally-based projects worldwide. It is designed to help countries rich in biodiversity but poor in financial resources to meet their objectives under international biodiversity conventions. Funded projects aim to benefit biodiversity conservation and local communities by addressing threats to biodiversity from over-exploitation, invasive species, habitat loss and degradation, climate change and pollution. Projects supported through the Darwin Initiative include: the Wildlife Wood Project in Cameroon and Ghana; a project on biodiversity, socioeconomics and agricultural development in São Tomé and Príncipe; the Developing Cross-sectoral Environmental Governance Platform for Mount Nimba project in Côte d'Ivoire, Guinea, Liberia; the capacity building of Mano River countries for compliance with CBD project in Sierra Leone; a project in Liberia to build the capacity of the next generation of natural resource managers (including creation of a Centre of Excellence for Ecological Research and Conservation Learning in Sapo National Park); a project in Cameroon to improve anti-poaching patrols and sustainable livelihoods, including in Korup National Park (CMR5); and a project in Sierra Leone to enhance habitat connectivity through sustainable development around the Gola Forest Reserve (SLE1) through cacao restoration and community livelihoods The UK government's International Climate Fund (ICF) was established in 2011 as part of the UK commitment to reduce poverty by helping developing countries adapt to climate change, take up low carbon growth and tackle deforestation. The ICF will provide GBP 3.9 billion of climate finance from 2011 to 2016. Ghana is a beneficiary country within the hotspot under the Community-based Adaptation (CBA) program, in association with CARE and other bilateral aid programs (participatory scenario planning, Farmer Field Schools, disaster reduction and early warning systems, community monitors and CBA plans). The Forest Governance, Markets and Climate (FGMC) Program aims to reduce the illegal trade in forest resources by addressing forest sector governance and market failures that permit illegal forest practices. It supports the negotiation and implementation of bilateral trade agreements under the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan in countries including Ghana and Liberia. The aim is to help protect forests, avoid carbon emissions, protect the livelihoods of forest-dependent communities and increase the incomes of men, women and children reliant on farming.	3.0 million
USA/ United States Fish and Wildlife Service (USFWS)	USFWS supports "wildlife conservation projects" in hotspot countries through four grant programs: 1) "Multi-national Species Conservation Funds" (for great apes, African elephant and marine turtles); 2) Wildlife Without Borders-Africa; 3) Amphibians in Decline Fund; and 4) Critically Endangered Animal Fund. The majority of recipients/ implementing agencies are international and local NGOs and universities. Grantees in the hotspot include CI, WCS, FFI, RSPB, A Rocha Ghana, Herp Conservation Ghana, CSSL (Sierra Leone), SOS Forêts (Côte d'Ivoire), Pan African Sanctuary Alliance and Chelonee (Guinea), Sea Turtle Watch (Liberia) and Njala University (Sierra Leone). Other grants are direct to relevant government Ministries (e.g. Instituto Nacional Desarrollo INDEFOR Forestal y Manejo del Sistema de Areas Protegidas in Equatorial Guinea). Over the period of analysis, USFWS supported 36 national and regional projects in the hotspot, covering all countries apart from Benin and Togo.	3.3 million

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
USA/ United States Agency for International Development (USAID)	USAID provides funding under several major REDD+ initiatives (including integration of biodiversity and REDD+ in the region) and specific programs with biodiversity conservation objectives. The US government also funds the Tropical Forest Alliance 2020 (see the discussion on strategic funding initiatives in Section 10.5.2). 1) The People, Rules and Organizations Supporting the Protection of Ecosystem Resources (PROSPER) project aims to introduce, operationalize and refine appropriate models for community management of forest resources for local self-governance and enterprise development" in Liberia. It builds on earlier USAID support to sector reform in post-conflict Liberia (land policy reform, land dispute resolution, customary rights and community forestry development). PROSPER has a total investment of USD 9 million between 2012 and 2017. 2) The Sustainable and Thriving Environments for West African Regional Development project (STEWARD), currently in its third phase from 2012 to 2015, focuses on Upper Guinean Forest ecosystems. The project is funded by USAID and implemented by USFWS and US Forest Service with partners (CARE, BioClimate, AUDER and PCI-Media Impact). It incorporates community-level activities, women's empowerment and livelihoods and building capacity for sustainable natural resource management (including community co-management of forests). Phase III includes scaling-up activities and coordination between community-level committees, government ministries and the Mano River Union (MRU) Secretariat. The four hotspot countries in the MRU are Côte d'Ivoire, Guinea, Liberia and Sierra Leone. Ghana and Nigeria are also beneficiaries (including ecotourism initiatives in Cross River State). STEWARD also incorporates regional strategies for sustainable agriculture, sustainable trade in natural resources and coastal and fisheries management. 3) In late 2015, USAID will launch a new regional program, called West Africa Biodiversity and Climate Change (WA-BiCC), integrating components on climate change adaptation, biodiversity-wildlife trafficking, mangroves and coastal area conservation (see Section 10.5.2). As well as supporting regional and national government-led initiatives on biodiversity conservation and climate change, this program will also have a dedicated component focused on engaging and strengthening civil society. Therefore, there are potentially strong linkages with the CEPF investment program. USAID also funds various research initiatives in hotspot countries. Although figures on current investments were not available, the following initiatives are of potential relevance to conservation: - CIFOR research grant for mapping Ebola and human and non-human transmission models to develop an early warning system under the Bushmeat Research Initiative. - Support to the Permanent Interstates Committee for Drought Control in the Sahel (CILSS) for hydrological and climate mapping and monitoring across West Africa, including in the four Mano River Union countries: Côte d'Ivoire; Guinea; Liberia; and Sierra Leone. - United States Geological Survey land cover/ land use program, which includes Benin, Ghana, Guinea, Côte d'Ivoire, Liberia, Nigeria, Sierra Leone and Togo.	19.1 million

A much larger study of the policies and programs of major European donors in relation to funding for forests and forest-dependent communities found that the element of ODA going from European donors to forest-related and biodiversity projects increased dramatically between 2002 and 2012 (fern UK 2015). The totals for the period were USD 2.9 billion and USD 1.6 billion, respectively. A significant contribution to forest ODA is from NICFI, which alone accounted for more than half of all donors' disbursements. The report underlines the difficulty of separating out relevant information even for individual countries (let alone KBAs or areas within the hotspot boundary), the significance (in terms of funding) of large thematic programs, and the need and cost implications for more detailed research if this level of information is required. The general trend has been for EU development aid spending to go up (including on climate, forests, and biodiversity), but for staff to go down. Consequently, much of this funding is disbursed to multilateral agencies and/or large, well organized recipients to reduce transaction costs for donor government staff. The report suggests that such funding may not be effective in reaching its intended targets in the recipient countries, because much of the money may never really leave these larger institutions. Of even greater concern, the report cited evidence of projects funded by some European development aid funds which 'have been shown to involve, or strongly appear to involve land grabs' and others which run the risk of involving land grabs in the future.

10.4.4 Foundations and Trusts

A variety of philanthropic foundations and trusts (both large and small) in North America, Europe and the Middle East provide conservation investment in the hotspot, principally through grants to international and local NGOs (Table 10.4). Many of these are small grants with a focus on a specific species, a research topic or capacity building. A few provide larger funding to broader thematic programs, such as climate change mitigation and adaptation. The most important philanthropic foundations and trusts operating in the hotspot, from the perspective of volume of investment, are the Arcus Foundation, the JRS Biodiversity Foundation and the Mohamed Bin Zayed Species Conservation Fund.

Table 10.4 Overview of Foundation, Trust and Fund Investments in Conservation in the Guinean Forests Hotspot between 2009 and 2014

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
Aage V Jensen Charity Foundation	The foundation is providing support, via BirdLife International (see NGOs, Table 10.5), to the project: "The Gola National Park in Liberia: realizing its vast potential" to facilitate the establishment of the Gola National Park in Liberia and support communities to sustainably manage forest resources to maximize benefits to them whilst protecting globally threatened endemic wildlife. Partners are BirdLife International, CSSL and the Forest Development Authority of Sierra Leone.	450,000
Arcadia (arcadiafund.org.uk)	Arcadia is a UK charitable fund providing grants to charities and scholarly institutions for preservation of the environment and cultural heritage. An Arcadia grant supports three BirdLife International Partners in the hotspot to build their capacity and ensure sustainable management of priority species and habitats. The BirdLife Partners are: GWS in Ghana, SOS Forêts in Côte d'Ivoire and SCNL (see also BirdLife International in Table 10.5).	40,000
Deutsche Welthungerhilfe E.v.	This German charitable foundation is providing funds for development and emergency aid, health, education and environmental protection. It provides technical and implementation support to Western Area Peninsula Non-hunting Forest Reserve KBA (SLE8) in Sierra Leone through the EU-funded project "Western Area Peninsula Forest Reserve and its Watershed" with local partner Environmental Forum for Action.	Amount not known

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
Arcus Foundation	The Arcus Foundation channels the majority of funding to projects in priority landscapes. In the hotspot there is also a focus on conservation of apes (e.g. western gorilla and chimpanzee) in their natural habitats. It supports initiatives and organizations which focus on long-term engagement and collaboration, including linking livelihoods and development initiatives with conservation goals and capacity building. Projects supported in the hotspot include: strengthening wildlife law enforcement in Cameroon (and other Central African countries); support to forest conservation in the Cestos-Sapo-Grebo-Taï-Cavally Corridor (Liberia-Côte d'Ivoire border) and supports Trans-boundary conservation between Okwangwo Division of Cross River National Park in Nigeria and Takamanda National Park in southwest Cameroon. Ape-related conservation activities include research, capacity building, community natural resource management in priority landscapes in Guinea (Fouta Djallon Massif), Sierra Leone, Côte d'Ivoire and Liberia. Partners include WCS, FFI, ZSL and national NGOs (e.g. Guinée Ecologie, Conservation Society of Sierra Leone, Wild Chimp Foundation (Côte d'Ivoire)). Arcus also supports chimpanzee sanctuaries in hotspot countries – including funding to Grebo in Liberia and Tacugama Chimp Sanctuary in Sierra Leone during the Ebola crisis.	2.3 million
Global Greengrants Fund	A US-based fund providing small grants to civil society and community-based projects "to invest in global grassroots change that honors people, livelihoods and ecosystems equally". The focus is on advocacy and environmental justice campaigns relating to extractive industries, land and water pollution, community rights and livelihoods, environmental diversity and economic justice. Between 2009 and 2013, green grants relevant to hotspot conservation were awarded in Cameroon (6), Côte d'Ivoire (1), Ghana (17), Guinea (1), Liberia (4), Nigeria (7), Sierra Leone (2) and Togo (2) amounting to a total of nearly USD 200,000 (individual grants between USD 3,000 and USD 10,000). Specific KBAs supported include Korup National Park (CMR5) in Cameroon.	200,000
JRS Biodiversity Foundation	This is a private foundation funded by an endowment created through the sale of a non-profit company (BIOSIS) to Thomson Scientific in 2004. JRS funds projects which support increases in, and availability of, biodiversity knowledge and data (to researchers, local communities, conservation practitioners, policy makers and the public), for the benefit and sustainability of life on Earth. Grants were awarded in Benin (National Biodiversity Information System), Ghana (University of Ghana – DNA Barcoding and Plant Biodiversity Data management) and subregionally (West African Marine Biodiversity), with University of Bergen Museum.	600,000
MAVA	The Swiss-based MAVA Foundation principally funds capacity building and research programs for conservation in the hotspot region. The main focus in the hotspot is on coastal and marine biodiversity which has some relevance to KBAs. Projects include conservation of sea turtles, seabirds, IBAs and Mprotected areas, fisheries and habitat management but information on individual grants to KBAs across the hotspot is not available. For example, the "Migratory birds and habitats project" (mangroves restoration and livelihoods in Freetown - Aberdeen creek) is supporting Sierra Leonean NGO CSSL, through BirdLife International.	40,000

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
Mohamed Bin Zayed Species Conservation Fund	This is a philanthropic endowment (funded by the Crown Prince of Abu Dhabi), which provides grants to individual species conservation initiatives; to recognize leaders in the field of conservation; and to elevate the importance of species in the broader conservation debate. Over the period of analysis, 50 projects totaling over USD 620,000 were funded in the hotspot. All countries in the hotspot have funded projects, from one to three (Benin, Equatorial Guinea, Guinea, São Tomé and Príncipe, Togo) to five to eight projects (Cameroon, Côte d'Ivoire, Ghana, Liberia, Nigeria, Sierra Leone). Country total investments vary from USD 6,000 (Benin, one project) to USD 112,500 (Côte d'Ivoire, eight projects). Individual grants vary in size from USD 6,000 to USD 25,000. Although it is not possible to determine whether all grants are allocated strictly within the hotspot, the focus is on threatened forest, fresh water and marine species (e.g. Lake Oku clawed frog (Mount Oku KBA (CMR15)), Togo slippery frog, green turtle, apes and monkeys, lion, endangered trees and other plants etc.) so the majority of grants are likely to represent conservation investment in the hotspot.	620,000
Gordon and Betty Moore Foundation	The Gordon and Betty Moore Foundation is investing in strengthening national and project-level capacity for REDD+ in Ghana through a grant to Forest Trends.	310,000

10.4.5 Others/ NGOs/ Private Sector

Several international conservation NGOs (e.g. BirdLife International, CI, FFI, IUCN, RSPB, WCF, WCS and WWF) have a strong focus on conservation action in the hotspot (project implementation, procurement of external donor and own matched funding and capacity building with national NGO partners). Several have country programs and/or subregional offices in the hotspot, including the BirdLife Africa Partnership WASRO (West Africa Subregional Office) in Accra and CI's office in Monrovia. International development NGOs (notably CARE) are often involved in partnership programs involving both biodiversity and livelihoods or poverty reduction objectives (for example, with bilateral donors USAID and the UK International Climate Fund, see Table 10.3).

Many regional and international academic institutions and zoos have species and habitat conservation programs with a forest conservation focus in the hotspot, often in partnership with INGOs. Wider partnerships including NGOs, governments, agencies and (increasingly) private sector finance are a developing theme in the region (see Section 10.5 on Trends and Gaps in Investment).

Table 10.5 Overview of NGO and Private Sector Investments in Conservation in the Guinean Forests Hotspot between 2009 and 2014

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
Amarada HESS	ASAMA , Equatorial Guinea	Amount not known
Chevron	Support to NCF to manage the Lekki Conservation Centre	Amount not known
Conservation International	CI's recent and current country focus in the hotspot is on Ghana, Sierra Leone and Liberia. Most CI grants are disbursed under thematic programs. These include the Global Conservation Fund/International Ecofund, which is supported by the Gordon and Betty Moore Foundation and gives grants to local communities, NGOs and governments for biodiversity and habitat protection and financial support for local economies. The fund provided USD 1.8 million of support towards conservation efforts for the Gola Forest Reserve (SLE1) led by RSPB and its partners. The Conservation Stewards Program (CSP) supports local farmers and communities who protect natural resources and ecosystem benefits on return for compensation from investors The Althelia Carbon Fund awards grants to support low-emission business projects and provide incentives to stop deforestation and deliver benefits to local communities. The fund also supports "carbon offsets," through which the private sector invests in projects that reduce CO_2 emissions from deforestation. The focus is on projects that bring environmental as well as economic benefits to improve the livelihoods of forest-dependent communities CI also contributed co-funding donor of USD 300,000 to the GEF project "Sustainable forest management in Equatorial Guinea for the conservation of representative ecosystems and globally significant biodiversity" implemented by UNDP, which targeted protected areas and KBAs, including Parque Nacional del Pico de Basilé (GNQ3), Reserva Cientifica de la Caldera de Lubá (GNQ2) and Annobón (GNQ1).	2.1 million
Conservation Leadership Program (CLP)	The CLP is run by a partnership of three international biodiversity conservation organizations (BirdLife International, FFI and WCS). It gives funding to early-career conservationists from developing countries (including the hotspot). Emerging leaders receive both the financing they need for conservation projects and the training, mentoring and networking opportunities that can help them advance their careers. Supported by BP plc and other corporate donors.	No specific biodiversity funding identified in the hotspot
Fauna & Flora International (FFI)	FFI has a widespread program of support in Cameroon and Nigeria (western gorilla, Afi Mountain Wildlife Sanctuary) and Upper Guinean Forest countries: Guinea, Côte d'Ivoire and Liberia, with a particular focus on the western chimpanzee, pygmy hippo and African elephant conservation, trans-boundary protected areas, capacity building and community engagement/alternatives to bushmeat hunting. Targeted Upper Guinean Forest KBAs and corridors include Massif du Ziama (GIN8) and Monts Nimba (GIN9) in Guinea, and Nimba mountains (LBR12), Sapo National Park (LBR14) and Wonegizi mountains (LBR17) in Liberia. FFI implements projects funded by donors including Arcus, USFWS, SOS, multiple donors to Sapo National Park (FFEM, GEF, USAID, UK Darwin Initiative etc.). FFI has worked in Liberia since 1997 and continues to support forest management, species conservation and sustainable community livelihoods as the country recovers from years of conflict. FFI supports the Forest Development Authority (FDA) in the gazettement and management of newly proposed protected areas and the implementation REDD+ through the Wonegizi Community REDD+ Pilot Project. See also Conservation Leadership Program.	Amount not known

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
International Union for Conservation of Nature (IUCN)	IUCN is technically an inter-governmental organization but operates in the hotspot region much like other international NGOs. The West and Central Africa Regional Office (PACO) manages the country program in Cameroon technical programs on protected area management tools, World Heritage and Ramsar site evaluations, and regional capacity building. IUCN serves as the secretariat for the SOS - Save Our Species initiative, in collaboration with the GEF and the World Bank (see Table 10.2). Grants are allocated according to strategic directions identified by the IUCN Species Program and Species Survival Commission. A total of 13 species grants (USD 9,000 to USD 90,000) were awarded in Cameroon, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone and São Tomé and Príncipe. Three are trans-boundary projects (Key Cross River Gorilla Habitat in Nigeria and Cameroon (WCS); Sharks and People in Guinea and Sierra Leone (AFRICASAW/ Save our Seas); and Community-managed Forest/ Trans-Border Reserve between Ghana and Côte d'Ivoire (West African Primate Conservation Action-Ghana). WCS, BirdLife International and FFI are implementing projects on birds in São Tomé, on primates in Nigeria's Cross River National Park, and on pygmy hippopotamus in the Wonegizi mountains (LBR17) in Liberia.	700,000
MARATHON	ECOGUINEA/INDEFOR-AP, Equatorial Guinea	Amount not known
Noble Energy	WCS/INDEFOR-AP , Equatorial Guinea	Amount not known
Ocean Energy	UNGE/BBPP, Equatorial Guinea	Amount not known
RSPB	RSPB (the BirdLife International partners in the UK) provides core support grants to three BirdLife partner NGOs in the hotspot, plus technical input, advice and training in several hotspot countries. The BirdLife Interational subregional office and conservation programs in West Africa also receive support and funding from RSPB and other members of the BirdLife International partnership. RSPB has also provided matching funding for large conservation projects in the hotspot especially towards conservation of Gola Forest Reserve (SLE1) and contiguous forests in Liberia.	3.3 million
Wetlands International Africa	Wetlands International Africa focuses on wetland conservation and restoration, with a head office in Dakar, Senegal and, within the hotspot, a subsidiary office in Nigeria (with a focus on the Niger Delta). Programs include the conservation of wetlands, and particularly mangroves, along the west coast of Africa and, inland, the West African Manatee and migratory waterbirds. Focal countries in the hotspot include Guinea, Nigeria and Sierra Leone. Wetlands International coordinates or supports regional initiatives including the Mangrove Charter and National Action Plans, Conservation Strategy for the West African Manatee, and the African Eurasian Waterbird Census (AEWC).	Amount not known
Wild Chimpanzee Foundation (WCF)	WCF is a European-based NGO with a regional head office in Abidjan, Côte d'Ivoire. Its focus is on the conservation of chimpanzees and their habitats in Liberia, Guinea, Sierra Leone and Côte d'Ivoire, including at the following KBAs: Parc National de Marahoué (CIV10); Parc National de Taï et Réserve de Faune du N'Zo (CIV11); and Forêt Classée de Cavally et Goin – Débé (CIV3).	Amount not known
Wildlife Conservation Society (WCS)	WCS has a focus on the Lower Guinean Forests subregion. In Cameroon and Nigeria, it is working on the conservation of western gorilla, chimpanzee and other primates in Cross River and Takamanda National Parks and Afi River Forest Reserve, and supporting the establishment of Mbam et Djerem National Park. WCS also works on Sea Turtle conservation in the Gulf of Guinea.	Amount not known

Donor	Main Countries and Themes of Investment	Total invested (2009-2014) (estimated, in USD)
World Wide Fund for Nature (WWF)	WWF's Central Africa Program is based in Cameroon and supports projects in Cameroon, including the Program for the Sustainable Management of Natural Resources (PSMNR) funded by GTZ/ DED/ KfW, including support to the following KBAs: Banyang Mbo Wildlife Sanctuary (CMR4); Korup National Park (CMR5); and Mount Cameroon and Mokoko-Onge (CMR12). WWF has less of a focus on West Africa than previously. The West Africa Forest Program Office has transformed into a new local organization, 'The Nature and Development Foundation', with a subregional office in Accra and a focus on strengthening the forest sector's capacity in West Africa for responsible forest management. WWF was involved as a partner and/ or co-financer of the following hotspot projects in the last five years: Améliorer la conservation de la biodiversité dans l'espace Taï (Côte d'Ivoire); SPWA - Development of Trans-frontier conservation area linking forest reserves and protected areas in Ghana and Côte d'Ivoire. The WWF Coastal Forests Program (SAWA) operates in a large area between the Sanaga and Cross Rivers in Nigeria and Cameroon.	500,000
Universities and Zoological Societies/ Zoos	Several international academic and charitable institutions are involved in conservation research and project implementation in the hotspot. The Zoological Society of London (ZSL), Zoological Society of San Diego (ZSSD) and International Primate Protection League (IPPL) support forest conservation and efforts to conserve great apes and specific sites (e.g. Ebo Forest) in Cameroon and Nigeria and work with local communities to develop alternatives to bushmeat hunting in Equatorial Guinea. North Carolina Zoological Society provides protection for western gorilla (ranger-based monitoring and law enforcement) at Afi Mountain Wildlife Sanctuary in Nigeria. Drexel University is the Implementing Agency for the USFWS-funded project Biodiversity Conservation on Bioko Island, Equatorial Guinea (including removal of threats to wildlife from bushmeat hunting).	Amount not known
Private sector example, IUCN/ Swiss govt./ Novella Partnership, Ghana, Nigeria	IUCN and Swiss State Secretariat for Economic Affairs. The project forms part of a public-private partnership called the Novella Partnership, co-ordinated by a secretariat, funded by Unilever and operating in Ghana and Nigeria. In Ghana, Unilever supports a local organisation (registered as a not-for-profit company), called Novel Ghana Development Limited (NDGL) which has the mandate to develop the supply chain for Allanblackia from the production of seedlings through purchasing of nuts to processing of the oil and finally to export to Unilever in the Netherlands.	Amount not known

10.5 Trends and Gaps in Investment in the Hotspot

10.5.1 Overall Trends

There is significant funding for biodiversity conservation projects and programs across the hotspot but the distribution of this funding is very patchy, and many KBAs and proposed corridors have received limited or zero investment. Although programs such as the UNDP-GEF Strategic Program for West Africa are supporting some national governments to review and strengthen national protected area networks, there is insufficient investment and capacity for effective management of national protected area systems across the hotspot, and in any case many KBAs are not part of national protected area networks and investment programs (see Chapter 4).

Multilateral funding is the largest component overall and the GEF is the largest investor in conservation in the hotspot. However, there is a trend towards more complex multi-country and multi-donor programs, often with GEF, EU or FFEM funding combined with bilateral development aid funding and other co-funding, making it hard to distinguish and separate donor contributions. Although GEF agencies (for example UNDP) have policies requiring the engagement of civil society in projects this does not make the funding easily accessible, especially for smaller NGOs or CBOs with limited capacity to work in partnership with large agencies and government structures. Stakeholders reported that even the GEF-SGP, which was originally intended as a civil society funding mechanism, had been captured by government in some countries (Ghana, for example) so that it is much harder, even for NGOs with strong track records in effective biodiversity conservation and work with communities, to access the funding. National and local NGOs and CBOs have a constant struggle to find funds which cover their core running costs and support their own priorities (rather than taking funds for project work that is not in their program in order to keep their finances afloat). It is particularly difficult to retain good, committed staff and build capacity in CSOs in countries in the hotspot which have expanding economies (e.g. Ghana, Nigeria) and where there is competition for good staff from the private sector (e.g. mining, energy, commercial agriculture) and also UN and other development agencies (and government), which can frequently offer far higher salaries.

Thematic Programs

Another trend is towards thematic programs covering broad themes such as climate change adaptation and resilience (of both communities and ecosystems). There is frequently a biodiversity component within these, but without detailed investigation of project objectives, target sites, implementation and monitoring outputs it is not possible to gauge how much direct biodiversity conservation impact they will achieve, particularly in relation to specific KBAs. Food security, human health and wildlife trafficking (including bushmeat hunting and marketing) are all themes which appear to be gaining importance in the region and especially in those countries in the hotspot recovering from the Ebola crisis. This was described as a “new poverty-health-environment paradigm” at a meeting of USFWS and other agencies in the region in 2014.

Consortia and Capacity; NGOs, Government and Private Sector

Some major donors increasingly expect funding applications to be made by partnerships or consortia (i.e. groups of NGOs or NGOs plus government, research institutes or private sector). This can also exclude smaller national NGOs and CBOs from access to funding if they do not have the capacity and management systems to engage with larger actors, even though they may be best placed to carry out relevant work, for example local community engagement). Some of the large INGOs (CI, BirdLife International/ RSPB and FFI especially) have greater capacity to engage with multi- and bilateral donors and access larger grants, matching these with their own funding and/or smaller amounts from trust funds and other donors and channeling this through national partner NGOs in-country. This can be a very effective way to build national and regional capacity, especially where the INGO supports national partners (NGOs and government) with a long-term commitment to countries, national NGOs and networks. BirdLife International has supported countries and BirdLife Partners in the hotspot, including 25 years support from RSPB/ BirdLife International to the Conservation Society of Sierra Leone and the Gola Rainforest National Park, and also long-term support to Ghana, Liberia, Nigeria, and (more recently), Cote d’Ivoire and São Tomé and Príncipe. FFI has similar long-term commitments in Guinea, Liberia, Sierra Leone. The Arcadia program, through BirdLife, currently supports capacity building of NGOs in several hotspot countries for national NGO development and conservation programs.

Private Sector and Public-private Partnerships

There are private sector companies which offer to 'connect' private sector finance and conservation projects or programs (often NGO-led). Other private sector initiatives similarly offer to link communities and forest biodiversity conservation with potential investors and financial markets. For example, Permian Global provides investment through the production and sale of high-quality verified carbon credits, generated through large-scale conservation and recovery of natural forest in Ghana (e.g. at Atewa Range Forest Reserve KBA (GHA3)) and other hotspot countries. Their approach is to 'invest in and manage natural forest protection and restoration projects across the tropics to deliver significant climate, biodiversity and social benefits' with a focus on large-scale forest protection projects, biodiversity conservation and community benefit-sharing. Another public-private partnership example involves IUCN and the Swiss State Secretariat for Economic Affairs in Ghana. The project is part of a broader public-private partnership (the Novella Partnership, which is co-ordinated by a secretariat, funded by Unilever and operates in Ghana, Nigeria and Tanzania). In Ghana, Unilever supports a local organisation (registered currently as a not-for-profit company), called Novel Ghana Development Limited (NDGL) which has the mandate to develop the supply chain for Allanblackia (a native forest tree) all the way from the production of seedlings through purchasing of nuts to processing of the oil and finally to export to Unilever in Holland.

Transboundary and Regional Initiatives

Several larger donors and programs promote trans-boundary KBA conservation initiatives and a small number of such initiatives have been funded, although some remain investigations rather than active partnerships involving two countries in joint management of a trans-boundary KBA. Programs include the Across the River Peace Park in Gola Forests (EU funding; RSPB, BirdLife, national governments and NGOs) between Liberia and Sierra Leone (and future plans for an even wider 'Greater Gola Landscape' initiative); and the GEF/FAO/WWF initiative Development of a trans-frontier conservation area linking forest reserves and protected areas in Ghana and Côte d'Ivoire.

Several other initiatives, particularly relating to primates, have a cross-border focus, though these are collaborative research agreements rather than joint management of trans-boundary KBAs. For example, research and action plans for conservation of chimpanzees and western gorillas on the border between Cameroon and Nigeria, with funding from a variety of donors (e.g. USFWS, Arcus, San Diego Zoo, WCS). Investments in other regional and trans-boundary initiatives include river basin management in the Volta River Basin and marine and coastal programs focusing on widespread habitats (e.g. mangroves) and migratory species such as fish, turtles and manatees.

10.5.2 Key Strategic Funding Initiatives

There are many climate-related funding initiatives across the hotspot and most countries are involved in global processes under the UNFCCC REDD+ (Reducing Emissions from Deforestation and Forest Degradation) processes. This aims to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and to invest in low-carbon paths to sustainable forest development and enhancement of forest carbon stocks. A variety of donor, government, NGO and private sector initiatives and partnerships operate in the hotspot to use these mechanisms to try to achieve sustainable biodiversity conservation financing.

Many large-scale KBA conservation programs are establishing Trust Funds for specific sites using a variety of funding mechanisms (Carbon trading, commodities, private sector finance etc.). For example, in Côte d'Ivoire, the GEF World Bank Protected Area Management Project (PCGAP) has the objective: "To enhance sustainable management of national parks and reserves in Ivory Coast by reversing trends of biodiversity loss, increasing the area of key ecosystems under protection and strengthening the capacity for resources management". One component includes the revitalization of a private foundation (initially established prior to recent conflicts, and based on an initial endowment of USD 57 million in IDA loans and GEF funding), which will fundraise and manage the financing for the long-term management of parks and reserves in post-conflict Côte d'Ivoire. Additional examples are given below.

The EU Global Climate Change Alliance (GCCA) was launched in 2007 to support developing countries in climate change mitigation and adaptation activities. Under the REDD+ component, the GCCA supports projects to reduce deforestation, create incentives for forest protection and preserve livelihoods and ecosystems that depend on forests. Several bilateral donors in the hotspot also have specific climate funding initiatives (see Table 10.3).

The USAID resources for integrating biodiversity and REDD+ in the region program will incorporate action for climate change adaptation, biodiversity-wildlife trafficking, mangroves and coastal area conservation under a new West Africa Biodiversity and Climate Change (WA-BiCC) Program, which launched in late 2015. The Tropical Forest Alliance (TFA) 2020 is a public-private alliance launched in 2012 by the US Government and the Consumer Goods Forum, a network of more than 400 global companies with over USD 3 trillion in annual sales. TFA 2020 partners are committed to taking action to reduce tropical deforestation tied to production of global commodities including palm oil, soy, beef, and pulp and paper (all major global drivers of tropical deforestation). TFA 2020 partners include developing country and industrialized country governments, businesses, and CSOs. USAID contributions to TFA 2020 include support for a new Global Forest Watch 2.0 tool, which will use satellite monitoring, tree cover loss alert systems, integrated maps with information on current land use and major concessions, and mobile technology to provide near real-time monitoring of tropical forests. GFW 2.0 is being developed by WRI, and USAID will work with partner countries to ensure they have the capacity to access and use the tool.

RSPB and BirdLife International in Sierra Leone and FFI in Liberia and Guinea are also supporting government and NGO partnerships in REDD+ processes, gaining access to carbon trading markets and financing mechanisms and to commodity markets (e.g. cacao) to finance conservation and community livelihoods in the hotspot. In Sierra Leone, early work in Gola Rainforest National Park was supported by the CI Global Conservation Fund, the Darwin Initiative, the EU and FFEM. RSPB is currently leading the development of the Gola REDD project which will result in the sale of carbon credits on the voluntary market under two leading standards (VCS and CCB) in 2015. The GRNP will be managed by a non-profit Company Limited by Guarantee.

The World Bank Program on Forests (PROFOR) is working with the Forest Development Authority and other partners on a 'National Biodiversity Offset Scheme: A Road Map for Liberia'. The program is exploring the feasibility of implementing a national biodiversity offset scheme in Liberia to help minimize adverse impacts on biodiversity resulting from mining. The proposed scheme would follow the "no net loss or net gain in biodiversity" approach and is investigating the feasibility of a national scheme that would finance the whole system of Proposed Protected Areas (Protected areas) in Liberia. This would cover currently unprotected KBAs such as Wonegizi mountains (LBR17) and link to current REDD and carbon credit/ financing approaches (Wonegizi mountains is a REDD+ pilot site, supported by FFI working with FDA). The ultimate aim will be to establish a Conservation Trust Fund to finance the national system of protected areas.

The Great Green Wall Initiative is a pan-African proposal to "green" a corridor of land across the continent south of the Sahara in order to combat desertification and tackle poverty and soil degradation. It was initially championed by the Presidents of Nigeria and Senegal with a focus on the Sahel and support from the World Bank, African Union and African Development Bank. GEF involvement has resulted in a broader approach of relevance to the hotspot in some countries and regions. The focus is on sustainable land and water management (SLWM) and adaptation in targeted landscapes and in climate vulnerable areas in West Africa and the Sahel (total USD 100 million). In Nigeria this approach is being applied at a catchment scale (including in the hotspot) under the national GEF-GGW initiative: the Nigeria Erosion and Watershed Management Project (NEWMAP). NEWMAP also links to catchments outside of its immediate focal area, such as the GEF SPWA Niger Delta Biodiversity Project which aims to mainstream biodiversity in to the oil and gas sector in the Niger Delta and to establish and capitalize a Niger Delta Biodiversity Trust under a private sector-government-community partnership.

A USD 1 million MacArthur Foundation 'Award for Creative and Effective Institutions' was made to Forest Trends in 2015 ('Bringing the value of forests into the modern economy'). Forest Trends created the international specialist Katoomba Group, to build market capacity and payments for ecosystem services and pioneered "no net loss" (the first global biodiversity offset standard to focus businesses, governments, financial institutions, and civil society on conservation). Forest Trends focuses on local communities and livelihoods by 'enabling Indigenous People to participate in environmental markets and benefit from preserving the forests they live in and around' (including payment or compensation mechanisms to local communities to maintain catchment protection or forest cover under carbon market agreements). They run the global platform 'Ecosystem Marketplace' to provide transparent information about ecosystem values and market transactions in these emerging markets. Forest Trends have worked with the private sector in Ghana.

A USAID initiative, The "Feed the Future Ebola Recovery Partnership" is being established in 2015 to engage and mobilize the expertise, infrastructures and resources of the private sector, foundations, and other partners, including in-country partners, to achieve a rapid and robust recovery from the Ebola outbreak and foster broad-based food security in the short, medium and long term in Liberia, Guinea and Sierra Leone. The three key objectives relate directly to food production and availability; economic access and SMEs; nutritional/ food security and reducing consumer vulnerability. There are no clear biodiversity objectives within this but there may be opportunities for funding for initiatives, which combine food security objectives with sustainable natural resource management, alternatives to bushmeat etc. Other multi- and bilateral development aid agencies (e.g. DFID in the UK) are developing post-Ebola response programs which may have the potential to support conservation as well as livelihoods and food security objectives. However, caution has been expressed about the risk of over-emphasis of these links, particularly in a funding context (see Section 10.5.4).

10.5.3 Efficiency and Effectiveness of Conservation Investments by Donor Type

Efficiency and effectiveness of conservation investments by donor type were assessed and ranked collectively by the stakeholders at the final consultation workshops that took place in Monrovia, Liberia and Limbé, Cameroon in August-September 2015 (Table 10.6). The stakeholders were requested to consider the efficiency (defined as the accomplishment of a goal with the least wastage of time and effort) and the effectiveness (defined as the production of the intended or expected results) of funds made available to CSOs for biodiversity conservation in the hotspot.

There are noticeable differences between the two subregions when considering the types of donors considered as most efficient versus most effective. In the Upper Guinean Forests subregion, the most efficient type of donor was felt to be private foundations, while the most effective in terms of impact was considered to be bilateral donors. For the stakeholders in the Lower Guinean Forests subregion, funds from NGOs were considered to be the most accessible to CSOs while bilateral donor funding was ranked as having the greatest positive impact for biodiversity conservation.

Table 10.6 Evaluation of Donor Types by Efficiency and Effectiveness for the Upper and Lower Guinean Forest Subregions

Donor Type	Upper Guinean Forests Subregion		Lower Guinean Forests Subregion	
	Efficiency	Effectiveness	Efficiency	Effectiveness
Multilateral	2	3	6	13
Bilateral	1	4	4	3
Foundation	4	2	1	2
Trust Fund				1
Private Sector	2	1	3	3
Governmental	2			
NGO			10	2

Note: The figures in the table represent the number of stakeholders who assessed a particular donor type as being most efficient or most effective.

Nevertheless, when asked to explain their choices, the stakeholders used very similar justifications. First, they explained that procedures to access funds from private foundations and NGOs are fast (funds are usualy released within one year after application) and more adapted to the capacities of the local CSOs. However, the average size of grants rarely exceeds USD 500,000, and thus projects are more limited in scope. Their second justification was that multilateral and bilateral donors (excluding their potential small grants programs) are often "out of reach" for local CSOs and potentially for international ones as well, unless they can form large consortia or partnerships. These funds are often disbursed to and through government institutions, where they can have a much more widespread impact as they can encompass transboundary projects, infrastructure development and negociations / implemention of policies. Modalities for accessing funds are thus crucial for CSO engagement. Simplified, fast and flexible procedures seemed to be more in line with their capacities both in terms of applying for funds and also in terms of managing them and reporting to the donor.

10.5.4 Gap Analysis

Gaps in investment in conservation in the hotspot include both geographical gaps (priority KBAs with no or insufficient funding) and thematic gaps (for example lack of capacity to implement conservation effectively). An analysis of the distribution of conservation investment among KBAs (based upon data collated from donor and project websites, verified through the stakeholder consultation process) showed that four-fifths of the KBAs in the hotspot received no known external funding over the last five years (Table 10.7). Most of the KBAs to receive external funding received between one and four grants over the period, while only three KBAs received five or more grants, comprising Parc National de Taï et Réserve de Faune du N'Zo (CIV11), Sapo National Park (LBR14) and Gola Forest Reserve (SLE1).

Table 10.7 International Donor Projects at KBAs in the Guinean Forests Hotspot

	KBAs with no Identified Projects	KBAs with 1 to 4 Identified Projects	KBAs with 5 or More Identified Projects
Number of KBAs	**106**	**28**	**3** Parc National de Taï et Réserve de Faune du N'Zo (CIV11) Sapo National Park (LBR14) Gola Forest Reserve (SLE1)

Source: Data on conservation investments collated from donor websites and other sources.

The only 'thematic gap' revealed through the consultation process is the lack of secure (long-term) funding and the difficulties of obtaining sufficient funding for effective conservation, especially for large and complex projects (for example in Equatorial Guinea and Bioko the difficulty of obtaining secure, "sustainable" funding or follow-on funds for KBA initiatives at the end of the funding cycle – even for management planning for nationally protected areas). Similarly in Sierra Leone, Yawri Bay (SLE9) is another KBA listed in the consultation as newly established (or in the final stages of establishment) but with no funding to implement any conservation management.

The Ebola crisis in several of the hotspot countries has brought an added burden on many KBA conservation initiatives, and the flexible support from both INGOs and multi- and bilateral donors during the crisis has proved essential. In Sierra Leone, the RSPB and EU have continued to pay salaries to staff in the Gola Rainforest National Park project while field activities were suspended due to the Ebola crisis. They have also contributed to the fight against Ebola in the area in and around Kenema through use of project vehicles and other support to local Ebola coordination efforts. Such support is essential to local communities and helps to cement good partnerships between projects and communities for longer-term conservation initiatives. The impacts of the crisis on national NGOs and CBOs have been considerable. The national NGOs, Conservation Society of Sierra Leone and Society for the Conservation of Nature in Liberia have both maintained activities in the capitals, despite having to suspend all field activities and to deal with the personal crises of their staff. Both CSSL and SCNL have run campaigns advocating against the eating of bushmeat, linking together the health dangers and conservation needs of bushmeat species in the hotspot. However, their programs, and especially their fundraising activities, have been seriously affected and there will be a great need in the post-Ebola months and years for support to civil society in all affected countries to ensure that their conservation activities can be reinvigorated and sustained. It is likely that the attention of the development aid community and donors 'post-Ebola' will be more focused on health, education and other immediate development needs so it will be a priority for conservation donors and agencies to ensure adequate funding for biodiversity conservation and priority sites in the hotspot. Although there are potential crossovers (and funding opportunities) linking conservation and health (Ebola) in the hotspot, caution has also been urged that the Ebola epidemic should not be used as a Trojan horse to achieve conservation ends.

Transboundary conservation program implementation also represents a gap in conservation investment. Trans-boundary projects require considerable investment in terms of time and money to negotiate and agree acceptable cross-border solutions and to ensure real integration across national boundaries and between different local communities. There are almost no funded initiatives in the hotspot with a sufficient long-term perspective and the funding to ensure the achievement of successful, durable trans-boundary initiatives.

10.6 Conclusion

National NGOs and CBOs in particular undergo a constant struggle to secure funds for their core operational costs of staffing, running their organizations, managing finances and building their capacity to carry out biodiversity conservation. They are frequently caught in a cycle of applying for specific project funds but failing to cost their own core funding needs adequately within project budgets and/or taking on projects and donor funding which do not support their own priorities and needs, in order to try to keep afloat financially afloat. There are very few investments directed entirely at capacity building for NGOs (only the Arcadia fund in the hotspot region and a few larger INGOs (RSPB and BirdLife, FFI) provide core funding and direct capacity building support to national NGOs). Many decades of core investment are required to build strong national NGOs capable of accessing and using donor funds effectively and forming partnerships with governments and the private sector. The hotspot region has a past and recent history of conflict and unrest in many regions, and has recently experienced a severe Ebola crisis. In this CSOs are often best placed to ensure the sustainability of conservation initiatives, through working effectively with local communities. However, this requires strong external support in capacity building and the securing of long-term funding to enable NGOs and CBOs to sustain their operations and impacts, and to engage effectively with larger players, such as governments and the private sector.

11. CEPF'S NICHE FOR INVESTMENT

The preceding chapters describe the context for biodiversity conservation in the Guinean Forests of West Africa Biodiversity Hotspot, in terms of regional background, conservation outcomes, social and legal context, CSO presence and capacity, threats to biodiversity and patterns in investment. The situational analysis informs an investment niche for CEPF, where the Fund can focus its resources most effectively on engaging and strengthening civil society to bring about biodiversity conservation.

11.1 Key Findings

Chapters 3 and 4 review the biological and ecological context and highlight that the hotspot harbors impressive levels of biodiversity, including numerous endemic species, making it a conservation priority at the global scale. At the national and local levels, the hotspot's forests and freshwater habitats provide a wide range of ecosystem services to millions of people, who, for the most part, are considered to be among the poorest globally. The provision of goods and materials from the hotspot's forests, including medicines, housing materials and food, is quite high, and is thought to contribute around 25 to 35 percent of the non-cash income to rural households. In addition, the hotspot's forests protect the catchments of rivers providing key sources of water for irrigation and domestic use. For instance, Western Area Peninsula Non-hunting Forest Reserve (SLE8), protects the catchment of the two reservoirs supplying Freetown, the capital of Sierra Leone, while Atewa Range Forest Reserve (GHA3) protects the three main rivers that supply Ghana's capital, Accra.

In terms of conservation outcomes, Chapter 4 reveals that at least 936 species found in the hotspot are threatened with extinction globally, including 135 species assessed as Critically Endangered: the highest category of threat. Major factors threatening species include unsustainable hunting, deforestation due to agricultural expansion and logging, and difficulties in enforcing laws on illegal hunting and incidental catches. The ecosystem profile also sets conservation outcomes at the site level, with 137 KBAs having been identified to date across the hotspot, comprising 124 terrestrial and 13 freshwater KBAs, with some overlap between the two. These KBAs have been ranked according to their relative biological importance, as an input to the prioritization process. The Upper Guinean Forests subregion contains 36 terrestrial KBAs and eight freshwater KBAs of high relative biological importance (i.e. Priority 1 and 2 sites), while the Lower Guinean Forests subregion contains 28 and five, respectively. In addition to the KBAs, the ecosystem profile also defines nine landscape-scale conservation corridors within the hotspot, spanning six countries in the Upper Guinean Forests subregion and two in the Lower Guinean Forests subregion. These corridors provide the basis for targeting conservation investments at a spatial scale greater than that of the individual site, particularly with regard to integrating biodiversity into sectoral development plans and policies.

The socioeconomic context for conservation in the hotspot is set out in Chapter 5. The main drivers of growth in the region are trade (Ghana), agriculture (Benin, Côte d'Ivoire, São Tomé and Príncipe, and Togo), the tertiary sector including transport (Cameroon), oil and gas production (Equatorial Guinea, Nigeria), and mining (Guinea, Liberia, Sierra Leone). In hotspot countries, forest resources are vital for energy, medicine, and income generation, as well as for the nutrition provided to local people by wild foods. Bushmeat is arguably the most valuable NTFP. The socioeconomic context of the hotspot has continued to shape its landscapes, with various implications for biodiversity conservation. Land tenure in the hotspot's countries is typically a blend of customary and statutory land rights. Several hotspot countries have suffered decades of civil unrest, placing them essentially off-limits for tourism, while the recent Ebola outbreak in Guinea, Liberia and Sierra Leone has also negatively affected tourism, as well as the economy more generally; the effects will continue to be felt for years to come. Others countries, such as Cameroon, Ghana and Nigeria, continue to offer ecotourism options within their remaining forests.

Chapter 6 shows that the governments of the hotspot countries are signatories to a range of international agreements, including multilateral environmental agreements, and that these have been incorporated into domestic policy, including through the development of National Biodiversity Strategies and Action Plans. At the regional level, the countries within the hotspot are all either Member State of ECOWAS or ECCAS. Regional priorities for the conservation and sustainable management of forest resources are defined by the convergence plans of ECOWAS and COMIFAC. These agreements influence national policy and the development of national laws, and most of countries in the hotspot have policies, laws and regulations in place around protected areas, forestry, environmental impact assessment, and poverty reduction. Some countries also have laws concerning land-use planning, community conservation, transboundary conservation, sustainable financing for species conservation, and decentralization of decision-making. In countries where they exist, these policy provisions create legal space for CSOs to engage in biodiversity conservation. One challenge, however, is to develop a comprehensive protected area network that supports prevailing customary land ownership and resource tenure. It will also be important to strengthen the capacity of government officials and manage conflicts over alterative land use practices.

In most parts of the hotspot, the degree of ecological connectivity among forest patches is declining, and the remaining forest is increasingly being restricted to the current network of protected areas and forest reserves. Work to improve forest management, enhance forest certification and reduce illegality in the forest sector is important across the hotspot. Thus, promoting community-based forest management in the countries where the legal framework allows it (e.g. Cameroon, Ghana and Sierra Leone) will be an important element of any conservation strategy for the hotspot. In addition, supporting and strengthening the ongoing process of decentralization will also be important, to enhance the transfer of decision-making power from central to local governments. Targeted action plans for key species, such as chimpanzee and western gorilla, will also require significant funding to implement, and this cannot rely indefinitely on international donors. Finally, despite the development of policies and laws conducive to biodiversity conservation over the past 20 years in the hotspot countries, the enforcement capacity of implementing agencies is limited by financial and human constraints in most countries in the region, in some cases severely.

As Chapter 7 shows, both national and international CSOs are contributing to the implementation of national conservation policies in the hotspot countries, and thereby helping their governments deliver on the Aichi Targets, the SDGs and other international commitments. For example, a number of CSOs have shown significant potential for implementing conservation strategies in the hotspot, with regard to forest governance, species conservation and, especially, climate change. Over the last decade, climate change adaptation and mitigation have been the most attractive themes for CSOs engaged in conservation-related fields. This is probably so because international donors have increasingly made climate change a funding priority.

Despite the complex working environment, CSOs continue to play a key role in supporting and complementing government policy and programs, especially at the local and sub-national levels, where decentralization has expanded local government mandates. However, capacity limitations remain a major barrier to the civil society sector playing a more effective role in the protection and sustainable management of natural resources in the hotspot. Moreover, most local CSOs in the hotspot have little or no experience of working with the private sector to advance a sustainable development agenda. This lack of engagement with the private sector is mainly due to inadequate technical capacity among CSOs, which is a limitation that will need to be addressed as a priority, especially since the hotspot harbors diverse mineral and hydrocarbon resources. Most local CSOs also lack the institutional and technical capacities to manage large or complex conservation projects, and lack access to sustainable sources of funding to address the various threats to biodiversity conservation that are present in the hotspot. In contrast, the international CSOs operating in the hotspot countries typically have adequate institutional capacities, with relevant technical expertise, although some of them could benefit from additional financial resources. There are a number of areas where international CSOs can demonstrate added value or unique capabilities, including with regard to mentoring and capacity building for local partner organizations, coordinating transboundary and regional cooperation and information flows, and design of sustainable financing mechanisms.

Chapter 8 reviews threats to species, sites and corridors within the hotspot and ranks them according to their severity. The top-ranked threat is unsustainable biological resource use, which takes the form of bushmeat hunting, logging and overfishing. The second-ranked threat is unsustainable agriculture and aquaculture. Agricultural expansion is a direct threat to terrestrial biodiversity, as forests are converted to agricultural lands. This is driven by a combination of human population growth within the hotspot, and international demand for and investment in agricultural commodities, such as rubber, cacao and palm oil. These crops are produced through a mixed of smallholder farming and, increasingly, large-scale plantations owned by agribusinesses. Agriculture is also an indirect threat to freshwater biodiversity. For example, freshwater ecosystems in the lower Niger River are threatened by drought and habitat loss due to increased offtake of water for irrigation.

Energy production and mining was ranked joint third by the stakeholder consulted during the profiling process. This threat takes a number of forms, including oil and gas production, hydropower generation, fuelwood and charcoal production, and mining. With the exception of fuelwood and charcoal production, these threats do not tend to be widespread but, rather, restricted to particular locations. Nevertheless, their direct impacts in these locations can be very severe, and they can have indirect impacts across a wide area. Energy production and mining shares the third rank with human instrusions and disturbance. This threat category includes impacts on biodiversity arising from recreational activities (e.g. tourism in protected areas), war and civil unrest, and work and other human activities. A related threat, identified in Nigeria, is ongoing conflict and insecurity in the Niger Delta. Other threats to biodiversity in the hotspot include climate change, pollution, and development of residential and commercial settlements.

Chapter 9 provides a review of the climate change context for conservation in the Guinean Forests. The hotspot includes two of Africa's six main climatic zones, namely the 'humid' and 'subhumid' zones. The wettest hotspot countries in terms of rainfall are Equatorial Guinea, Liberia and Sierra Leone. Climat change is starting to be observed in the hotspot. The overall picture is one of increasing temperatures, decreasing and less predictable rainfall and sea-level rise. These trends are predicted to have direct impacts on biodiversity, leading to changes in species' distributions and placing increased stress on ecosystems already under pressure from the human activities described in Chapter 8. There are currently few studies from the region looking at the response of species and ecosystems to climate change. More readily observable are the indirect impacts of climate change on biodiversity, arising from changes in agricultural and resource use patterns and, ultimately, displacement of human populations in response to climate change. For example, decrease in agricultural productivity is likely to increase dependence on wild natural resources, such as bushmeat and edible wild plants. A combination of widespread poverty, recurrent droughts, inequitable land distribution, and agriculture with a high level of dependence on rain makes the hotspot countries highly vulnerable to climate change and variability. To combat climate change impacts, each hotspot country has developed national action plans, strategies and/or communications describing the most pressing climate change problems and how they expect to tackle them.

The assessment of current conservation investment in Chapter 10 reveals that funding is available for direct conservation of species and habitats, as well as for broader 'themes', which have potential to indirectly benefit biodiversity conservation, for example climate change, poverty reduction, etc. Although national governments provided funding for biodiversity conservation, available data indicate that these are limited, as conservation is a relatively low budgetary priority. Grants from multilateral and bilateral donor organizations are by far the largest source of conservation funding in the hotspot. A variety of philanthropic foundations and trusts in North America, Europe and the Middle East also provide conservation investment in the hotspot, principally through grants to international and local NGOs. There are private sector companies that offer to 'connect' conservation projects (often NGO-led) to private sector finance. Other private sector initiatives offer to link communities and forest biodiversity conservation with potential investors and financial markets.

The level of conservation investment the hotspot as a whole is not insignificant but the picture is very patchy, with many KBAs and corridors receiving very limited or zero funding. The assessment identifies those sites that have received no funding over the last five years, or otherwise represent significant funding gaps. The assessment also highlights the lack of secure long-term funding for conservation, which is a major barrier to sustaining effective management on the ground and retaining the trust of communities engaged in conservation initiatives and related livelihood activities. There remain very few conservation investments directly targeting capacity building for local communities, CSOs and government agencies. Yet, lack of capacity at the field level, combined with shortage of long-term funding, remain the major obstacles to sustained and effective conservation initiatives in the hotspot.

11.2 CEPF Niche

The countries of the Guinean Forests of West Africa Hotspot are experiencing unprecedented economic growth, based on extractive industries, agribusiness and infrastructure expansion, which brings the promise of development to millions of people, but also come with potentially large environmental and social costs. At the same time, the benefits of development are not shared equitably across the hotspot, with large sections of the rural population practicing subsistence agriculture and depending heavily on extractive uses of natural resources. Improving the conservation prospects for species and ecosystems in the hotspot will require strategies that achieve a balance between economic development and biodiversity conservation objectives, while ensuring that rural people, especially women, can benefit from sustainable and equitable development. In this context, and to meaningfully address identified gaps in current conservation investment, CEPF will promote the conservation of globally important biodiversity at species, site and corridor scales, while promoting development models that are environmentally sustainable, socially equitable, and well aligned with national conservation priorities.

To do this, the CEPF investment niche is **to provide CSOs at grassroots, national and international levels with the tools, capacity and resources to establish and sustain multi-stakeholder partnerships that demonstrate models for sustainable, pro-poor growth and achieve priority conservation outcomes in the Guinean Forests of West Africa Hotspot**. Local CSOs are very knowledgeable because they understand the local and national context of biodiversity conservation and sustainable development, as well as the needs and aspirations of local people. However, they have shown low capacity for fundraising, sustainable financing and private sector engagement. Involving international CSOs in the delivery of the program, where they demonstrate clear added value, will facilitate capacity building of local CSOs, to ensure policy reform and implementation of conservation actions on the ground. CEPF, through its grantmaking and RIT, will also catalyze and support multi-stakeholder partnerships, among governmental agencies, private sector companies, CSOs and local communities and their associations, while at the same time establishing long-term funding mechanisms for conservation, especially ones that take advantage of growing markets for biodiversity and ecosystem services.

Based upon the situational analysis presented in Chapters 3 to 10, and informed by the results of the stakeholder consultations, the CEPF investment niche was defined in three dimensions. Geographic priorities for investment at the site scale were defined as a set of 'priority sites', selecting from among the list of KBAs identified in the hotspot (Table 4.4). Geographic priorities for investment at the landscape scale were defined as a set of 'conservation corridors', providing for conservation actions related to development and land-use planning and policy (Table 4.12). Thematic priorities for investment were defined as a set of investment priorities grouped under broad strategic directions by identifying fields of work that: contribute to the conservation of globally important biodiversity; fill gaps in existing conservation investment; address high priority threats; focus where civil society can make the most effective contribution to conservation; and, where appropriate, deliver human well-being benefits. In order not to disperse investment too thinly, and to maximize the chances of achieving a transformational impact on particular issues, CEPF's investments will specifically prioritize three development sectors with large biodiversity footprints, namely agriculture, forestry, and mining. The investment strategy is intended to guide investments by other funders, either through the mechanisms put in place by CEPF or in parallel. These other investments may align with those of CEPF by focusing on a different set of geographic priorities, responding to the impacts of other sectors or supporting complementary actions for the same geographic and thematic priorities.

11.3 Theory of Change

The analysis presented in the earlier chapters reveals that the Guinean Forests Hotspot is characterized by diverse socio-economic, cultural and political conditions, and that conservation and sustainable use of biodiversity is influenced by many actors, with varied interests and aspirations. Remaining natural ecosystems remain under pressure and will continue to be degraded and fragmented in the absence of more effective responses. At the same time, experience with conservation efforts in the hotspot to date, including but not limited to earlier investments by CEPF in the Upper Guinean Forests, points the way towards conservation strategies that have the promise of success. The theory of change takes into consideration these different conditions, actors, challenges and opportunities, and is grounded in on-the-ground realities, as understood by the stakeholders consulted during the profiling process. It seeks to address the CEPF investment niche defined in Section 11.2, namely to support CSO at different levels with the necessary tools, capacity and resources to create sustainable partnerships and resources to achieve priority conservation outcomes.

The theory of change underlying the CEPF niche is that local CSOs have untapped potential that, if released, can contribute to reconciling biodiversity conservation with development agendas at different scales and improving natural resources governance in the Guinean Forests Hotspot. To realize the potential of civil society as a force for sustainable, pro-poor growth in the hotspot, CEPF investment will need to be delivered in a strategic manner, with grant resources linked to capacity building and partnership building across sectors, to leverage complementary capabilities, strengthen networks across borders, and facilitate transboundary conservation and exchange of information and lessons learned. At the same time, conservation efforts must be relevant to local communities and incorporate meaningful benefit sharing mechanisms that ensure the participation of vulnerable groups, especially Indigenous People and women. Without responding to the legitimate development needs and aspirations of local communities, it is unlikely that conservation initiatives will reach a level of social acceptance that ensures their long-term sustainability. As well as ensuring relevance to local communities and incorporating capacity building for civil society actors, CEPF investments must also ensure ecological connectivity at the landscape scale, in order to maintain and restore ecosystem function, maintain viable species populations, buffer sites against the effects of fragmentation and isolation, and enhance resilience to the impacts of climate change. In other words, investments in species-focused and site-based conservation should not be made in isolation but with consideration to their contributions to connectivity at the corridor-scale.

Focusing on connectivity, community and capacity will require the development and consolidation of robust partnerships, including not only civil society but also other partners like government, private sector and the donor community. There will be a need to explore opportunities to leverage additional funding and/or align with other initiatives from the very beginning of the investment phase, to complement the resources CEPF is able to marshal and ensure sustainability beyond the end of CEPF funding to the hotspot. There will also be a need to make sure that CEPF's limited resources are made effective use of, including by monitoring the effectiveness of different approaches, facilitating experience exchange among grantees, and promoting replication of good practice. In these regards, the role of the RIT will be of critical importance, in building a portfolio of grants whose overall impact is greater than the sum of its parts, and it will need to be resourced accordingly. In addition, to maximize opportunities to engage local CSOs as grantees, and to take account of the high costs of operating at remote sites with difficult access, it is proposed that the maximum small grant size for the portfolio be set at USD 50,000 per grant (which may be one or more years in duration).

12. CEPF INVESTMENT STRATEGY

12.1 Geographic Priorities

This chapter synthesizes the results and feedback from the stakeholder consultation process (including both workshops and remote consultations) and recommendations from the preceding chapters to formulate a CEPF investment strategy for the next five years in the Guinean Forests Hotspot. The information thus analyzed reveals that, although most stakeholders are in dire need of funds to sustain their conservation efforts, there is limited funding available from donors for this purpose, and that those resources that are available tend to be difficult for local CSOs to access. Also, even where funds are available and accessible, donors sometimes find it difficult to decide where and how to invest effectively in conservation, because of a lack of adequate empirical data on the needs and priorities of target groups and the values of individual sites. This lack of information has become a barrier to cost-effective and results-oriented investments, especially for donors working under tight timeframes and other constraints. This leads to the conclusion that sound investment decisions require the type of detailed, systematic analysis of scientific data and contextual information, such as is presented in this ecosystem profile.

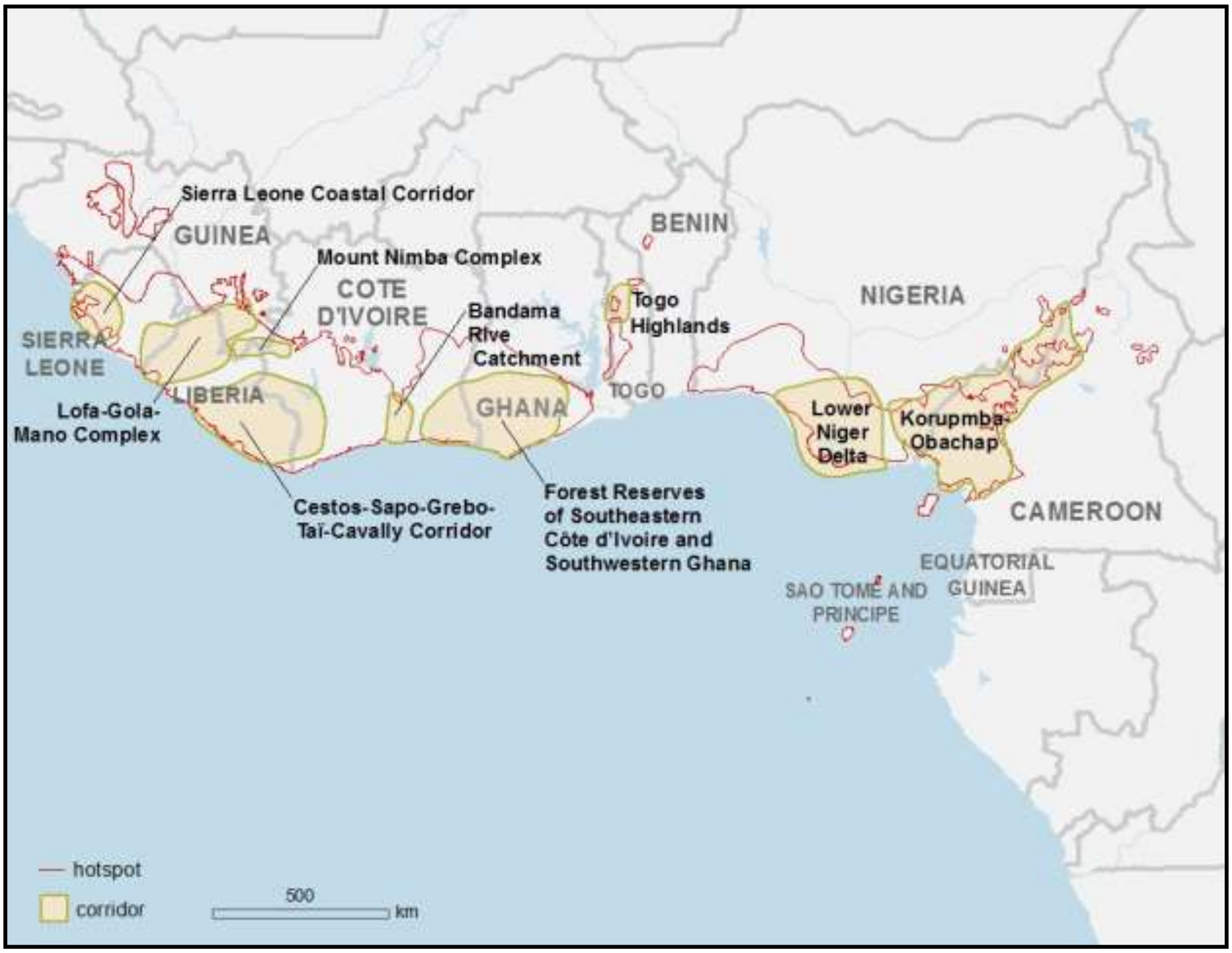
Given the fragmented nature of many of the remaining sites of global biodiversity importance within the hotspot, it is highly desirable that, wherever possible, CEPF-supported projects aim to maintain or increase the ecological connectivity of these sites, and ideally focus at the landscape scale, giving focus to the priority corridors identified in this profile.

The nine conservation corridors described in this profile are given in Table 12.1 and Figure 12.1. These cover a total area of 413,183 km^2, equivalent to 66 percent of the hotspot, and range in size from the Togo Highlands at 6,049 km^2 to the Korumpba-Obachap Corridor at 118,675 km^2. Although four of the corridors are restricted to single countries, five are transboundary and provide opportunities for coordinated actions across borders. Several conservation corridors also incorporate a number of entire river basins, from their headwaters to their outflow. These corridors provide opportunities for basin-wide approaches, extending from high altitude areas to coastal zones. For instance, reforestation of upland sites may provide downstream benefits to other sites in the corridor through a reduction in sediment loads.

Table 12.1 Conservation Corridors in the Guinean Forests Hotspot

No.	Corridor Name	Countries	Area (km^2)
1	Sierra Leone Coastal Corridor	Sierra Leone	17,096
2	Lofa-Gola-Mano Complex	Sierra Leone, Liberia, Guinea	47,545
3	Mount Nimba Complex	Guinea, Côte d'Ivoire, Liberia	6,829
4	Cestos-Sapo-Grebo-Taï-Cavally Corridor	Liberia, Côte d'Ivoire	70,278
5	Bandama River Catchment	Côte d'Ivoire	8,389
6	Forest Reserves of Southeastern Côte d'Ivoire and Southwestern Ghana	Côte d'Ivoire, Ghana	72,579
7	Togo Highlands	Togo	6,049
8	Lower Niger Delta	Nigeria	65,743
9	Korupmba-Obachap	Cameroon, Nigeria	118,675

Figure 12.1 Conservation Corridors in the Guinean Forests Hotspot



To promote ecological connectivity within the conservation corridors, it is important to focus on all sites of biological importance, not only KBAs designated as protected areas but also those under other designations, including within production landscapes. In this regard, it is evident that all KBAs identified within the corridors warrant attention. Nevertheless, to ensure that CEPF investments are not spread too thinly, and are thus able to deliver significant, sustained impacts, it it was necessary to select a set of priority sites, from among the full list of KBAs in the hotspot, to receive targeted investment (Appendix 5). These priorities allow investments by CEPF to focus on sites of high global biodiversity value that present good opportunities to engage civil society in conservation, without duplicating investments by national governments or international donors.

Two exercises were conducted to identify priority sites from among the full list of KBAs in the hotspot. First, an initial biological prioritization was conducted, to identify sites of the highest relative biological importance, based on the principles of irreplaceability and vulnerability (see Section 4.3.3). Second, during the final stakeholder consultation workshops, expert opinion was used to identify sites presenting the greatest opportunities for CEPF investment, based upon the application of a set of standard criteria. Finally, the results of the two exercises were combined, to produce a final prioritization that took into account both scientific information and expert opinion. In this way, the priority sites respond to the needs, priorities and aspirations of CSOs from across the hotspots, while ensuring that CEPF investments remain targeted towards the conservation of globally important biodiversity.

Eight standard criteria were used to guide deliberations among stakeholders regarding selection of priority sites for CEPF investment. The first criterion was biological importance. The relative biological importance of each KBA was determined by an assessment of species-based vulnerability, species-based irreplaceability and site vulnerability, following the methodology set out in Section 4.3.3. During the final consultation workshops, it was recognized that a prioritization system based upon a narrow set of global criteria does not necessarily capture the full range of values that determine the global biological importance of a site. Consequently, a number of additional factors were taken into consideration, including importance for emblematic species, and importance for delivery of realized ecosystem services.

The second criterion was degree of threat. Additional consideration was given to KBAs with site vulnerability scores that highlighted the presence of major threats, such as large infrastructure (roads, dams, railways, etc.), agriculture (including agri-business), oil exploration and exploitation, pipelines, mining, urbanization and climate change. Although there is a clear association between human population presence and level of threat faced, this factor is considered to be an underlying driver and is, therefore, considered implicitly in the assessment of other threat types.

The third criterion was need for additional funding. The level of investment by national and international donors and governments for conservation of the KBA was taken into account. This was to understand whether there was a need for CEPF to invest in a particular site, and to avoid duplicating efforts of other funders operating in the hotspot.

The fourth criterion was management need. Consideration was given to the existence of management plans, personnel, infrastructure and mechanisms for community engagement and sustainable funding. Since management needs are key factors in sustainable management of priority sites, preference was given to KBAs where the needs are high.

The fifth criterion was capacity of civil society to engage in conservation at the KBA. This criterion was applied to data derived from the institutional capacity surveys and consultations and highlighting the capacity needs of local civil society groups, CBO, etc. These provided insight into where and how CEPF could invest most effectively to engage and strengthen the capacity of civil society, especially local organizations, to make sure that they are fully involved in the implementation of the CEPF conservation outcomes.

The sixth criterion was operational feasibility. This was one of the most important criteria because it determines whether or not civil society and other actors can effectively work in a particular site, taking into account the accessibility of particular sites, costs of implemting and monitoring conservation actions there, and the presence of some security threats, health risks and legal barriers.

The seventh criterion was opportunity for landscape-scale conservation. This criterion took into the account the potential for civil society and other actors to work together to achieve conservation at a landscape-scale through linking KBAs together, including through transboundary cooperation.

The final criterion was alignment with national priorities. KBAs that were recognized as priorities in National Biodiversity Strategies and Action Plans and other national policy documents were given additional priority because they presented opportunities to support hotspot governments contribute to the Aichi Targets, SDGs and other international commitments, and to align CEPF support to investments in conservation from national budgets.

These criteria were applied to data collated through the remote stakeholder consultations, using a scoring system. Based upon this desktop analysis, the 56 KBAs with the highest scores were presented at the final stakeholder consultations as candidate priority sites, and the assembled stakeholders were asked to narrow down the list of priority sites for each country, taking into account the prioritization criteria. At this final stage of stakeholder review, a limited number of modifications to the KBA list were proposed, by merging or extending KBAs. This resulted in a final list of 40 priority sites for CEPF investment (Table 12.2).

It is important to be aware that the socio-economic contexts and situations in and around the priority KBAs can vary widely. For example, in areas such as the Bakossi Mountains (CMR1) in Cameroon and the Reserva Cientifica de la Caldera de Lubá (GNQ2) on Bioko Island, inhabitants follow traditional methods of subsistence agriculture and practice small-scale logging for local purposes, whereas in the Western Area Peninsula Non-hunting Forest Reserve (SLE8) in Sierra Leone, logging occurs at much greater level, because the sale of fuelwood to inhabitants of the nearby capital city of Freetown constitutes a major income-generating activity for many local people. Around Nigeria's Obudu Plateau (NGA9), farming is becoming a much less common practice, as much of the younger generation are pursuing education in a bid to change their vocation, and because tourism is also able to provide some income to local people. Such socio-economic differences can have implications for the strategies and successes of conservation investements at a given site, and, while such factors were not considered explicitly in our prioritization process, there will be a need to look into the socio-economic context as part of the grant making process, and applicants will be asked to consider such factors when seeking grants.

Table 12.2 Priority Sites for CEPF Investment in the Guinean Forests Hotspot

Code	Priority Site	Realm	Total Area in Hectares	Priority Score
	CAMEROON			
CMR1	Bakossi Mountains	Terrestrial	75,581	1
CMR2	Bali-Ngemba Forest Reserve	Terrestrial	899	2
CMR3	Bamboutos Mountains	Terrestrial	7,396	1
CMR6	Mbi Crater Faunal Reserve - Mbingo forest	Terrestrial	3,233	1
CMR12	Mount Cameroon and Mokoko-Onge	Terrestrial	107,143	1
CMR15	Mount Oku	Terrestrial	16,353	1
CMR16	Mount Rata and Rumpi Hills Forest Reserve	Terrestrial	45,200	1
CMR18	Tchabal Mbabo	Terrestrial	312,347	1
CMR19	Yabassi	Terrestrial	264,867	2
fw1	Lake Barombi Mbo and surrounding catchments	Freshwater	176,536	1
	CÔTE D'IVOIRE			
CIV3	Forêt Classée de Cavally et Goin - Débé	Terrestrial	197,925	2
	EQUATORIAL GUINEA			
GNQ1	Annobón	Terrestrial	2,871	1
GNQ2	Reserva Cientifica de la Caldera de Lubá	Terrestrial	51,075	3
GNQ3	Parque Nacional del Pico de Basilé	Terrestrial	32,256	1
	GHANA			
GHA3	Atewa Range Forest Reserve	Terrestrial	21,111	2
GHA9	Cape Three Points Forest Reserve	Terrestrial	4,545	2
GHA29	Tano-Offin Forest Reserve	Terrestrial	43,061	2
	GUINEA			
GIN6	Konkouré	Terrestrial	45,744	1
	LIBERIA			
LBR1	Cestos - Senkwen	Terrestrial	350,405	2
LBR2	Cestos/Gbi Area	Terrestrial	316,490	4
LBR7	Grebo	Terrestrial	282,195	2
LBR11	Lofa-Mano Complex	Terrestrial	437,854	2
LBR12	Nimba mountains	Terrestrial	13,254	2
LBR14	Sapo National Park	Terrestrial	155,084	2

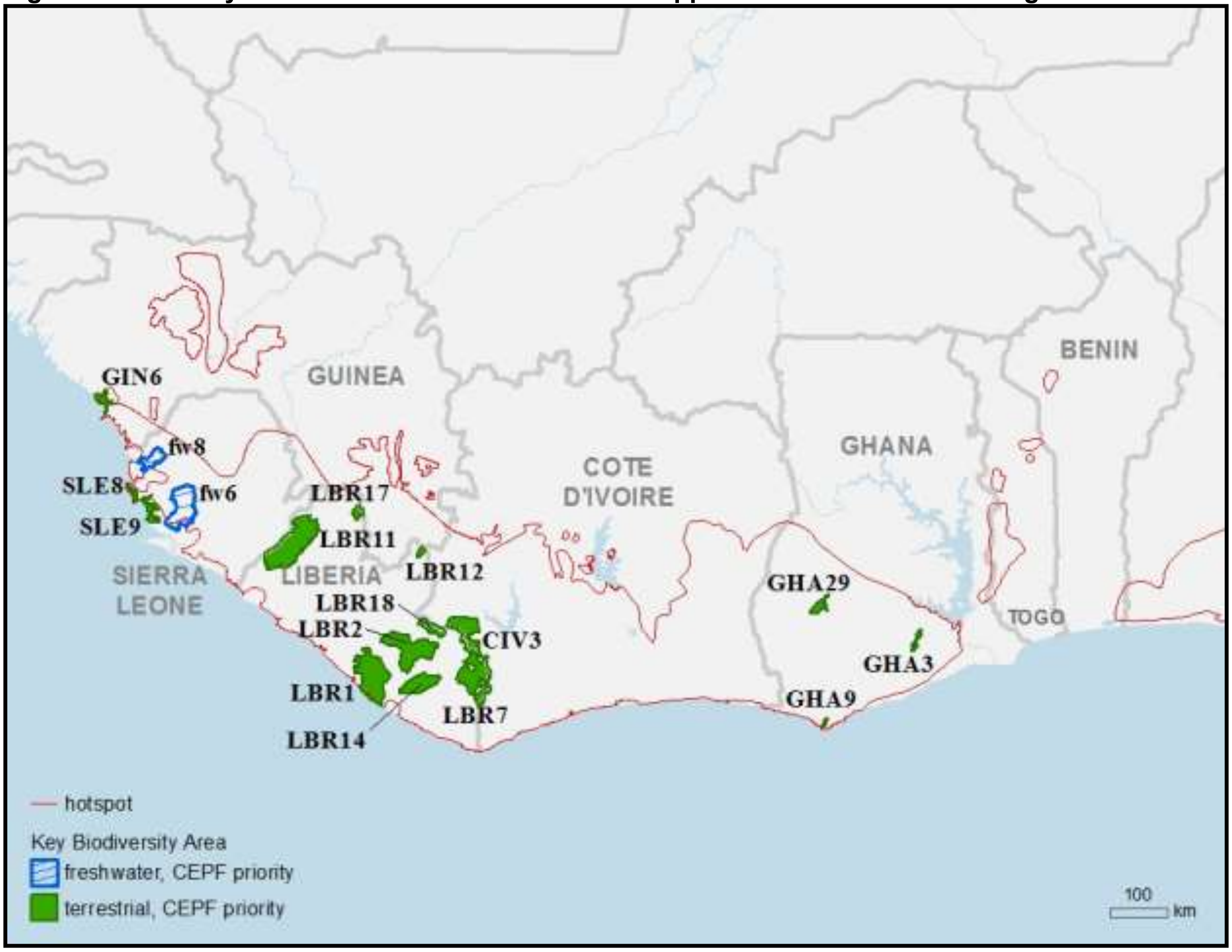
Code	Priority Site	Realm	Total Area in Hectares	Priority Score
LBR17	Wonegizi mountains	Terrestrial	28,868	2
LBR18	Zwedru	Terrestrial	64,458	1
	NIGERIA			
NGA4	Cross River National Park: Oban Division	Terrestrial	268,952	3
NGA5	Gashaka-Gumti National Park	Terrestrial	586,803	4
NGA7	Mbe Mountains and Cross River National Park: Okwangwo Division	Terrestrial	95,288	2
NGA9	Obudu Plateau	Terrestrial	70,743	2
fw10	South East Niger Delta - near Calabar	Freshwater	269,451	2
fw13	West Niger Delta	Freshwater	493,149	2
	SÃO TOMÉ AND PRÍNCIPE			
STP1	Parque Natural Obô do Príncipe	Terrestrial	5,670	1
STP2	Parque Natural Obô de São Tomé e Zona Tampão	Terrestrial	44,830	1
STP3	Zona Ecológica dos Mangais do Rio Malanza	Terrestrial	229	2
STP4	Zona Ecológica da Praia das Conchas	Terrestrial	522	1
	SIERRA LEONE			
SLE8	Western Area Peninsula Non-hunting Forest Reserve	Terrestrial	16,414	1
SLE9	Yawri Bay	Terrestrial	54,674	2
fw6	Gbangbaia River Basin	Freshwater	266,478	2
fw8	Rhombe Swamp and Mouth of Little and Great Scarcies Rivers	Freshwater	88,460	1

The priority sites range in size from the 229 hectare Zona Ecológica dos Mangais do Rio Malanza (STP3) in São Tomé and Príncipe to the 586,803 hectare Gashaka-Gumti National Park (NGA5) in Nigeria. Taken together, the 40 priority sites cover 53,184 km^2, equivalent to nine percent of the total area of the hotspot (Figures 12.2 and 12.3).

There are 17 priority sites in the Upper Guinean Forests, comprising 15 terrestrial KBAs and two freshwater KBAs. The largest concentration is in Liberia, including five sites adjacent to neighboring countries, which provide opportunities for transboundary cooperation. Another concentration is in the coastal zone of Sierra Leone and neighboring Guinea, which provides opportunities for conservation of mangroves and other important coastal ecosystems, as well development of payment for ecosystem service mechanisms.

There are 23 priority sites in the Lower Guinean Forests, comprising 20 terrestrial KBAs and three freshwater KBAs. Most of the priority sites are located along the chain of volcanic mountains that stretches across northwestern Cameroon and into the Gulf of Guinea. These sites all support localized endemism: those in Equatorial Guinea and São Tomé and Príncipe because they are oceanic islands; and those in Cameroon because they are islands of montane habitat. There is another concentration of priority sites along the border between Cameroon and Nigeria, which, again, provides opportunities for transboundary cooperation.

Figure 12.2 Priority Sites for CEPF Investment in the Upper Guinean Forests Subregion

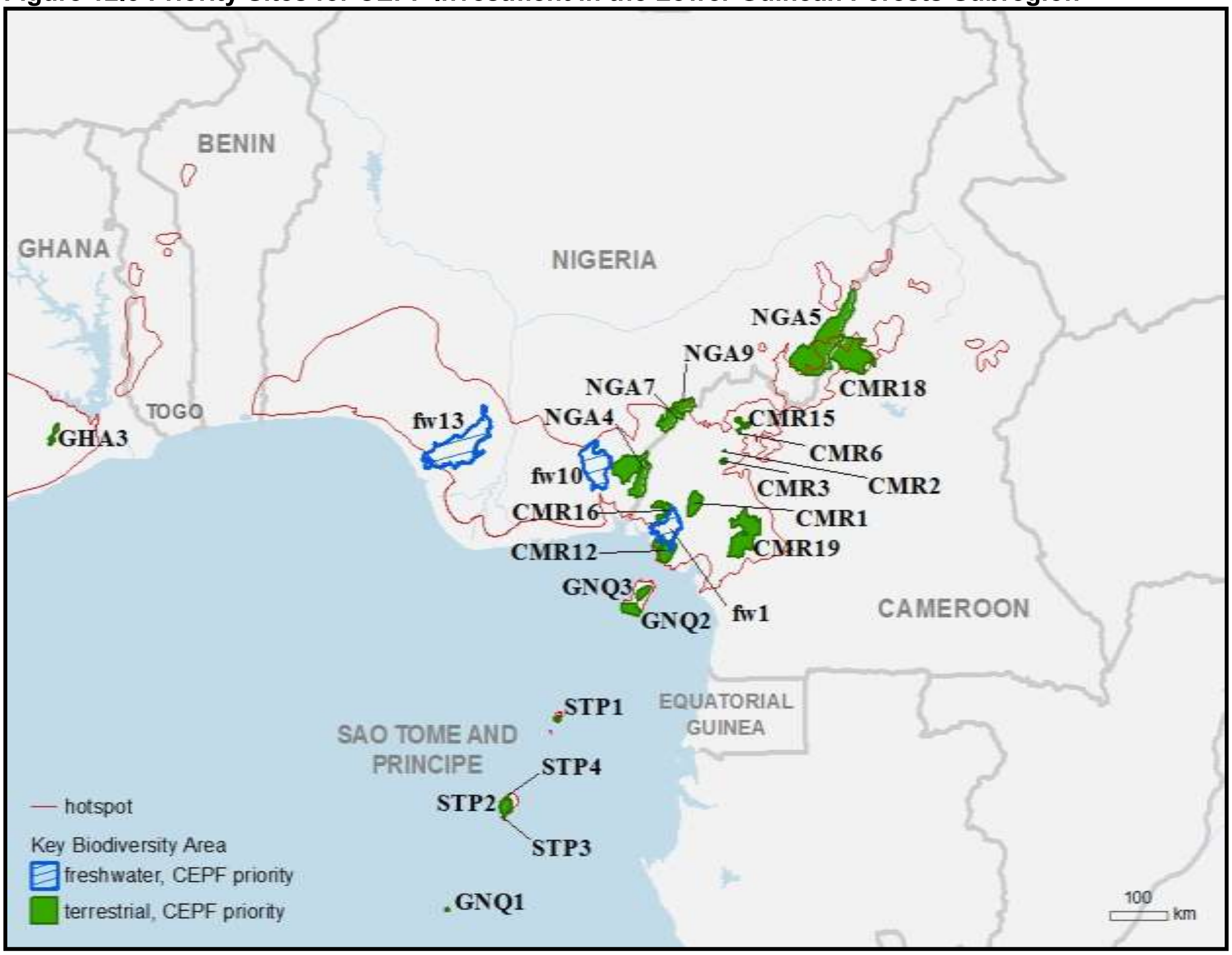


The 40 priority KBAs represent a mix of protected areas in need of management improvement and strengthened community participation in conservation, and areas outside of protected areas that are very vulnerable to threats and in need of conservation management. In most cases, the conservation need for these 'unprotected' sites is not for inclusion within national protected area systems (which are severly underfunded, meaning that expansion would be likely to result in the creation of 'paper parks') but for innovative, locally appropriate conservation models that involve communities, local government and, where relevant, private sector actors in collaborative actions. Six priority sites are wholly included within protected areas in IUCN categories I to IV, and three have between 25 and 75 percent of their area included. The remaining 31 priority sites are not included within protected areas in IUCN categories I to IV, although some are under other management designations at least nominally consistent with biodiversity conservation, such as forest reserve (*forêt classée*).

Based on the results of the initial biological prioritization, 21 terrestrial and six freshwater KBAs were assigned the highest priority score. These sites are the highest biological priorities for conservation in the hotspot, because the loss of any of them would result in the global extinction of at least one species (Table 4.10). Seventeen of these KBAs were included in the final list of priority sites agreed during the final stakeholder consultations. Five of the exceptions were in

Cameroon, which, with 10 priority sites selected, more than for any other country, was considered to present adequate opportunities for engaging civil society in conservation of the highest global conservation priorities. Another exception was Gola Forest Reserve (SLE1), which was considered to have a relatively low need for additional conservation investment, due to major past investments by the European Union, and a planned voluntary carbon offset. Finally, four Priority 1 freshwater KBAs were not selected as priority sites for various reasons, including that stakeholders considered them to have limited opportunities for engaging CSOs in their conservation.

Figure 12.3 Priority Sites for CEPF Investment in the Lower Guinean Forests Subregion



Of the remaining 23 priority sites, 19 were assigned a priority score of 2. The remaining four were all included because stakeholders at the final consultation workshops considered them to have high relative biological importance that was not well captured by the prioritization scheme, including important populations of primates and other emblematic species.

Some of the KBAs not selected as priority sites were excluded mainly because of lack of information. In addition, several candidate KBA sites were proposed during the final consultation workshops, which had not been identified during earlier exercises. This indicates that there is a need to fill knowledge gaps and integrate new information into the identification of KBAs and, eventually, an update of priority sites for CEPF investment strategy. Opportunities for doing so may arise at a later stage of the investment process or during a future update of the ecosystem profile.

12.2 Strategic Directions and Investment Priorities

The aim of this section is to present a five-year investment strategy for CEPF to support CSOs to conserve global biodiversity in the Guinean Forests Hotspot. This will be done by targeting investment towards 13 investment priorities grouped into five strategic directions (Table 12.3). This is only a subset of the investment priorities that were identified during the stakeholder consultations, because not everything could be addressed over five years with the level of funding available and considering the absorptive capacity of civil society in the hotspot. A shortlist of candidate investment priorities was developed through the consultation process, drawing on the results of the situational analysis, especially the analysis of threats and drivers (Chapter 8), which informed the types of conservation action needed to address immediate threats and their root causes, and the analysis of the civil society context (Chapter 7), which informed the types of investments required to engage and strengthen civil society, especially local groups. This list was then narrowed down during the final consultation workshops by applying the following four criteria: (i) need for additional funding (informed by the analysis of conservation investment in Chapter 10); (ii) appropriateness for implementation by civil society; (iii) availability of CSOs with the necessary skills and connections for implementation; and (iv) urgency for implementation during the next five-years.

The resulting investment strategy includes actions appropriate for civil society to lead at local, national and regional levels. At the local level, the focus is on demonstrating practical solutions to conservation and development threats and problems that have the potential for wider replication. At the national level, the focus is on empowering civil society to influence conservation policies and private sector business practices in ways that positively affect biodiversity conservation, through partnerships and dialogue. Since some priority KBAs and conservation corridors are transboundary in nature, for example the Korupmba-Obachap Corridor, support will also focus on regional and transboundary actions that facilitate conservation of transboundary clusters of KBAs, facilitate regional dissemination of information and conservation models, and contribute to the emergence of a regional conservation movement.

Furthermore, since most countries in the hotspot have identified the conservation of biodiversity as their major nature-based solution to climate change, especially through their engagements in ongoing REDD+ preparatory processes (as reflected in relevant REDD+ Strategy Documents), it is logical for this strategy to encapsulate climate change as a theme. Specifically, CEPF will support civil society to participate in an influence to the climate change discourse in favor of mitigation and adaptation responses beneficial to biodiversity conservation, such as REDD+ and ecosystem-based adaptation. In addition, the strong focus on capacity building that runs through the investment strategy will enable local CSOs to play an increasingly important role in conceiving, implementing and monitoring climate change mitigation and adaptation projects.

Table 12.3 CEPF Strategic Directions and Investment Priorities in the Guinean Forests Hotspot

Strategic Direction	Investment Priorities
1. Empower local communities to engage in sustainable management of 40 priority sites and consolidate ecological connectivity at the landscape scale	1.1 Strengthen the elaboration and/or implementation of land-use planning, land tenure and forestry reforms to facilitate good governance in the management of community and private reserves and concessions
	1.2 Promote preparation and implementation of participatory management plans that support stakeholder collaboration in protected area management
	1.3 Demonstrate sustainable livelihood/job creation activities for local communities that will act as incentives for the conservation of priority sites (e.g. domestication of wildlife species, sustainable logging from locally-controlled forests, harvesting of NTFPs, sustainable agriculture, etc.)
2. Mainstream biodiversity conservation into public policy and private sector practice in the nine conservation corridors, at local, sub-national and national levels	2.1 Conduct policy-relevant research, analysis and outreach that informs and influences the development of national government conservation policies, including on protected area management, payment for ecosystem services, REDD+ and ecosystem-based adaptation to climate change
	2.2 Generate locally-relevant information on natural ecosystems (e.g., economic valuations of ecosystem services) to influence political and economic decision-making in favor of their conservation
	2.3 Facilitate partnerships among local communities, private sector and government to demonstrate models for best practice mining, sustainable forestry and sustainable agriculture by private companies
3. Safeguard priority globally threatened species by identifying and addressing major threats and information gaps	3.1 Support the implementation of Conservation Action Plans for Critically Endangered and Endangered species on the IUCN Red List
	3.2 Update the KBA analysis by incorporating recently available data, including on Alliance for Zero Extinction sites and global Red List assessments and by conducting targeted research to fill critical knowledge gaps
4. Build the capacity of local civil society organizations, including Indigenous People's, women's and youth groups, to conserve and manage globally important biodiversity	4.1 Strengthen the capacity of local civil society organizations in financial, institutional and project management, organizational governance, and fundraising
	4.2 Establish and strengthen women-led conservation and development organizations, associations and networks to foster gender equality in natural resource management and benefit sharing
	4.3 Strengthen the communication capacity of local civil society organizations in support of their mission and to build public awareness on the importance of conservation outcomes
5. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team	5.1 Operationalize and coordinate CEPF's grant-making processes and procedures to ensure effective implementation of the investment strategy throughout the hotspot
	5.2 Build a broad constituency of civil society groups working across institutional and political boundaries to achieve common conservation objectives

Strategic Direction 1. Empower local communities to engage in sustainable management of 40 priority sites and consolidate ecological connectivity at the landscape scale

Chapter 7 reveals that pressure from local communities to meet their basic daily needs is a threat to the conservation and sustainable management of many KBAs. Chapter 8 highlights that hunting and overfishing are threats to wildlife populations in all hotspot countries, driven in large part by the demand for protein among expanding rural communities, as well as urban populations with increasing purchasing power. This chapter also reveals that rural population growth, coupled with increasing demand for agricultural commodities within and outside of the hotspot, is driving agricultural expansion, leading to habitat loss. Illegal logging and unsustainable extraction of fuelwood and charcoal are additional threats, which are again driven by external demand combined with a lack of sustainable livelihood options for local communities. These threats are especially severe in KBAs that are not adequately covered by protected areas but even protected areas have serious problems with unsustainable resource use. Chapter 6 also highlights that most countries in the hotspot have legislation in place related to protected areas, forest management and environmental protection. However, the capacity of government agencies to actually enforce the law is, in many cases, weak. This is especially so in remote forest areas outside of protected areas. In this context, local communities are often the best placed actors to address key threats to priority sites, either alone or in collaboration with government agencies. Currently, however, local community involvement in conservation is patchy. Where they have limited incentives or economic alternatives, they may engage in illegal or unsustainable activities, such as conspiring with illegal loggers, miners and poachers to deplete species populations and degrade natural habitats.

To address these issues, CEPF will support projects that empower local communities to engage in sustainable management of the 40 priority sites identified in Table 12.2, in order to consolidate ecological connectivity at the landscape scale. Investment Priority 1.1 will focus outside of conventional protected areas, taking advantage of policy reforms to pilot new, community-led models for site conservation, such as community reserves and conservation concessions. Investment Priority 1.2 will work within protected areas, to promote participatory management plans that create opportunities to engage communities and other local stakeholders as active partners in conservation. Finally, Investment Priority 1.3 will focus on all priority sites and demonstrate sustainable livelihood activities that have the potential to address local people's needs and incentivize them to participate in the conservation and sustainable management of biological resources. The focus of these investments will be on those communities that are currently placing the greatest pressure on priority sites, which means that they may not necessarily be inside the boundaries of the KBAs themselves. To be eligible for CEPF support, all projects under this strategic direction must engage target communities at all stages of project design and implementation, take account of existing governance structures, including customary ones, and address access to resources for local people and equitable sharing of costs and benefits. Projects that aim to address illegal logging and/or respond to issues of forest governance should also demonstrate alignment with the EU FLEGT Action Plan, and, where they exist, VPAs.

Investment Priority 1.1 Strengthen the elaboration and/or implementation of land-use planning, land tenure and forestry reforms to facilitate good governance in the management of community and private reserves and concessions

It has been observed in the hotspot that current land tenure arrangements are one of the main issues that are hampering conservation, mainly because communities and private companies do not typically own the agricultural or forestry land they use, because most land belongs to the State, which leases it out for temporary use. This land tenure system makes it very difficult for smallholder farmers or companies to invest in a wide parcel of land over a long period of time, since they are afraid that the government may retake or change ownership of their lands; especially considering, as field experiences have revealed, that land allocation is not done in a transparent way. Land-use planning is also an issue due to overlapping jurisdictions among different government bodies, leading to land-use practices that conflict with one another. For example, there have been cases where mining permits have been granted to exploit minerals in forest concessions owned by another concessionnaire.

These problems with land-tenure are gradually being addressed through policy and legislative reforms that favor secured community and private ownership of lands over longer periods. Taking advantage of this opportunity, CEPF will support participatory land-use planning processes and methodologies, notably those that empower communities to own and manage land and forestry resources. At some sites, this will require supporting actions that protect the rights of communities and private sector investors against the whims and caprices of local government officials and other stakeholders. In some cases, CEPF investments will result in the establishment of community or private reserves or conservation concessions. However, the models that integrate biodiversity conservation into the management of production landscapes will also be supported under this investment priority, even if they do not explicitly involve the establishment of conservation areas.

Investment Priority 1.2 Promote preparation and implementation of participatory management plans that support stakeholder collaboration in protected area management

Elaboration and implementation of participatory management plans is an important approach to sustainably manage protected areas. The consultation process revealed, however, that some protected areas lack management plans, the legal duration of many other plans has expired, while some with valid legal status are not being respected due to a lack of participation of local stakeholders in their preparation. There is also a shortage of financial and human resources on the part of government agencies charged with protected area management. All this is not facilitating the participation of CSOs, local communities and other stakeholders in the preparation and implementation of protected area management plans.

CEPF will, therefore, support CSOs to work with local and national governments and designated private sector officials to brainstorm, elaborate, update, implement and monitor the implementation of participatory management plans. In this way, key enabling conditions will be put in place for collaborative management of protected areas, that treat local stakeholders as positive partners in conservation, and give them a voice in management decisions.

Investment Priority 1.3 Demonstrate sustainable livelihood/job creation activities for local communities that will act as incentives for the conservation of priority sites (e.g. domestication of wildlife species, sustainable logging from locally-controlled forests, harvesting of NTFPs, sustainable agriculture, etc)

It is widely recognized by stakeholders consulted during the preparation of the ecosystem profile that, because local communities depend heavily on natural resources for their livelihoods, it will be very difficult for them to conserve natural resources if they either do not have access to sustainable livelihood projects or alternative development strategies that reduce their dependence on unsustainable forms of natural resource use. Also, because of a high incidence of poverty, some community members connive with poachers and illegal loggers, in exchange for either part of the booty or funds to cover their immediate medical or household needs. This partially explains why many conservation projects in the hotspot have allocated an important part of their resources to incentivizing local communities to fully participate in conservation programs and activities, and experience from the first phase of investment suggests that such approaches yield significant results. However, it is important to note that lessons learned from the consultation process and previous CEPF investments in the hotspot show that local projects will also fail if sound and transparent benefit-sharing mechanisms are not set up to promote good governance virtues, and if the sustainability of financial incentives is not ensured.

CEPF will support local communities in and around the priority KBAs to conceive, develop and/or implement sustainable livelihood projects, such as domestication of wildlife and indigenous fruit species, apiculture, nature-based tourism and sustainable harvesting of NTFPs. With regard to domestication of wildlife species, there is an inherent risk of domestication projects facilitating the ‘laundering’ of wild-caught animals and, thereby, facilitating poaching and wildlife trade. To mitigate this risk, all activities will be closely monitored, support will only be given for domestication of non-threatened species, such as cane rats, and CEPF will support the development of legal community enterprises to facilitate the implementation of these activities.

With regard to domestication and transformation of NTFPs, the stakeholder consultations revealed that value-addition and marketing of NTFPs has been very difficult for communities in the hotspot because of a lack of funds, technology, know-how and markets. CEPF will therefore support communities (financially and technically) to sustainably harvest, transform and market these products, while supporting complementary activities to develop markets for the finished products.

As well as reducing pressure on natural resources and encouraging communities to support conservation efforts on the ground, sustainable livelihood activities are also expected to build capacity among community leaders. The skills developed can be later employed for community mobilization for conservation activities. Projects supported under this investment priority will be expected to ensure the equitable involvement of women in the design and implementation of project activities, including in leadership positions. Grantees must also ensure that participatory benefit sharing mechanisms are designed, implemented and monitored to enable all stakeholders to fully participate in and receive benefits from projects that are equivalent to their efforts and costs, giving priority to vulnerable groups, including Indigenous People and women.

Strategic Direction 2. Mainstream biodiversity conservation into public policy and private sector practice in the nine conservation corridors, at local, sub-national and national levels

Most countries in the hotspot are in dire need of development projects to create employment and generate revenues to pay for education, health care and other essential services. As such, development projects, such as mines, hydroelectric dams and large-scale cash crop plantations tend to be viewed positively by public officials and elected representatives. However, one of the main causes of biodiversity loss in the hotspots is the development and implementation of large development projects that do not adequately integrate environmental concerns and social safeguards.

As seen in Chapter 8, agriculture and aquaculture is viewed by stakeholders as the second ranked threat to biodiversity in the hotspot, while energy production and mining is the third ranked threat. A number of hotspot countries are currently planning and implementing large development projects within or close to priority sites. To balance the exigencies of development and the need to conserve biodiversity, there is, therefore, a need to mainstream biodiversity conservation into government development policies, legislation and regulatory frameworks, as well as the business practices of private sector companies.

Since most existing policies, laws and legislation were elaborated without full consultation with stakeholders, notably rural communities and civil society, significant opportunities exist for policy reforms that promote sustainable, pro-poor growth models. The availability of resources and the absorptive capacity of conservation organizations in the hotspot mean that CEPF investments over the next five years will be able to test and refine a range of innovative conservation and sustainable development approaches at selected sites but will not be able to amplify these alone. Rather, CEPF will support targeted research, analysis and outreach to facilitate evidence-based policy making that takes into account the economic and climate values of natural ecosystems, i.e. natural capital accounting (Investment Priority .2.1). This will be complemented by initiatives that generate locally relevant information that can influence political and economic decision making to facilitate the sustainable management of priority KBAs (Investment Priority 2.2). Finally, CEPF grants will empower local communities and their associations to engage with private sector and government actors and demonstrate good practice models for sustainable development, particularly with regard to mining, agriculture and forestry: the three sectors targeted by the CEPF investment program (Investment Priority 2.3). The geographic focus for investments under this strategic direction will be the nine conservation corridors (Figure 12.1).

Investment Priority 2.1 Conduct policy-relevant research, analysis and outreach that informs and influences the development of national government conservation policies, including on protected area management, payment for ecosystem services, REDD+ and ecosystem-based adaptation to climate change

Information on the conservation outcomes in the Guinean Forests is patchy, and mainly limited to the intrinsic values of biodiversity, such as levels of species richness, threat and endemism. This information, while highly relevant to apportioning conservation investment, is unlikely to influence national policy making, which needs to compare the socio-economic costs and benefits of different alternatives. With a few exceptions, information on the social and economic values of natural ecosystems and the services they provide is either unavailable or limited to anecdote.

Consequently, CEPF will support the undertaking and dissemination of policy-relevant research and analysis that will facilitate the development of national policies that support sustainable protected areas management, payment for environmental services and the use of nature-based solutions to climate change, especially ecosystem-based adaptation. In particular, support will be given to projects that promote biodiversity as a co-benefit within REDD+ policies and strategies. Activities under this investment priority may require the participation of research institutions and policy think-tanks, as well as NGOs with a poverty-alleviation focus. Projects will be encouraged to incorporate information generated on the values of natural ecosystems under Investment Priority 2.2, where relevant.

Investment Priority 2.2 Generate locally-relevant information on natural ecosystems (e.g., economic valuations of ecosystem services) to influence political and economic decision-making in favor of their conservation

In order to support policy-reform and economic decision-making that will favor conservation over alternative development visions inconsistent with the long-term persistence of biodiversity, it is very important to generate science-based and locally rooted information on the socio-economic values of natural ecosystems and the ecosystem services they provide.

To this end, CEPF will support the generation of locally relevant information that will ecourage sound economic and political decision-making. Because decision-makers in government and private sector will quantify the development alternatives to investments in the conservation of priority sites in economic terms, the conservation scenario must also be quantified in the same terms, if decision makers are to be influence in favor of it. Projects under this investment priority could help establish the evidence basis for subsequent development of payment for ecosystem services or other long-term financing mechanisms under Investment Priority.2.1

Investment Priority 2.3 Facilitate partnerships among local communities, private sector and government to demonstrate models for best practice mining, sustainable forestry and sustainable agriculture by private companies

Most countries in the hotspot have elaborated national development strategies and goals that emphasize the mining, agriculture and forestry sectors as engines of development. To ensure that developments in these sectors proceed in ways consistent with the conservation of biodiversity, there is a need for demonstration models that adapt global best practice and sustainability standards, and apply them in the local context. To this end, CEPF will support projects that aim to facilitate partnerships among local communities, private companies and government bodies to demonstrate such models at priority sites. CSOs are well placed to facilitate such partnerships, to introduce the partners to international standards, such as FSC certification for forestry projects, and the RSPO and Sustainable Agriculture Network standards in the agriculture sector, and to develop market linkages for certified commodities.

Strategic Direction 3. Safeguard priority globally threatened species by identifying and addressing major threats and information gaps

At least 936 species in the Guinean Forests Hotspot are globally threatened (Table 4.1). The analysis presented in Chapter 8 indicates that the most widespread threat affecting these species is unsustainable biological resource use, followed by agriculture and aquaculture, and pollution. Moreover, as seen in Chapter 10, there is very limited funding from donors for species based conservation. The conservation needs of many globally threatened species would be adequately addressed through habitat protection and controls on unsustainable exploitation at the KBAs where they occur; this calls for site-based conservation actions. Such actions will be taken for the most highly threatened species, and guided by available species conservation action plans, to ensure they align with other investments by national governments and international donors (Investment Priority 3.1). In parallel, CEPF will support analysis of newly available data, complemented by targeted research to fill critical gaps, in order to provide more reliable information on which to base allocation of scarce resources and design of strategies for the conservation of globally threatened species (Investment Priority 3.2). Priority will be given to projects that align with the EU's strategy for wildlife conservation in Africa (European Commission 2015).

Investment Priority 3.1 Support the implementation of Conservation Action Plans for Critically Endangered and Endangered species on the IUCN Red List

Other species have conservation needs that require species-specific actions. For instance, poaching is a threat to many populations of globally threatened primates across the hotspot. While site-based protection can alleviate this pressure, it needs to be complemented by actions to address illegal trade in bushmeat, which is driving poaching at many sites. This requires complementary actions away from KBAs, for instance consumer demand reduction campaigns in urban centers. Another example is globally threatened vultures, which are wide-ranging species that can cover hundreds of kilometers in search of carrion and occur widely outside of KBAs. Site-based action is not sufficient to meet the conservation needs of vultures, which are exposed to threats in the wider landscape, including decline in wild ungulate populations, secondary poisoning by toxins used to kill carnivores, and targeted killing to provide parts for traditional medical practices.

Under this investment priority, CEPF will support species-specific conservation actions that address priorities set out in Conservation Action Plans for globally threatened species. CEPF funds will not be used to prepare the plans themselves but will be reserved for implementation of plans already prepared or to be prepared with other sources of support. In order to focus limited resources among the extensive list of threatened species in the hotspot, support will be limited to species assessed as Critically Endangered or Endangered: the two highest threat categories. Although 405 species fall into one of these categories, it is likely that most activities under this investment priority will address either mammals or birds, of which there are only 35 and 17, respectively (Table 4.1), because site-based conservation actions will be largely sufficient for most species in other taxonomic groups.

Investment Priority 3.2. Update the KBA analysis by incorporating recently available data, including on Alliance for Zero Extinction sites and global Red List assessments and by conducting targeted research to fill critical knowledge gaps

As has been seen, this profile has highlighted some important information taxonomic and regional gaps that make it very difficult to accurately evaluate the conservation status of many species or the relative biological importance of different KBAs in the hotspot. Of perhaps greater concern is the fact that many sites of global importance for the persistence of biodiversity have not yet been identified and documented as KBA, especially in the freshwater realm. A more comprehensive KBA identification would not only draw attention to sites in need of conservation action but also facilitate the implementation of environmental standards, for instance those of the International Finance Corporation and the Equator Banks.

CEPF will support actions to fill these information gaps. Data on the status of species and sites that became available during the profiling process or that become available during the implementation of the investment strategy will be used to update the KBA analysis. In particular, there is a need to define additional terrestrial KBAs in the Lower Guinean Forests for taxonomic groups other than birds, and to conduct comprehensive identification of freshwater KBAs across the entire hotspot. This investment priority will also support a limited number of highly targeted field surveys to fill critical gaps in knowledge with regard to the status of selected species and sites. The information generated will inform planning, implementation and monitoring of conservation actions for globally threatened species, while the surveys themselves will provide early career conservationists, such as postgraduate students, with opportunities to gain field experience and work with conservation organizations.

Strategic Direction 4 Build the capacity of local civil society organizations, including Indigenous People's, women's and youth groups, to conserve and manage globally important biodiversity

Lessons learned from ongoing and recent conservation projects in West Africa have highlighted the need to build partnerships and alliances among the three key sectors of society – government, private sector and civil society – to develop and implement solutions to the complex sustainable development challenges facing the region. Civil society faces a number of barriers to engaging in such partnerships, the most significant of which are capacity ones. The CEPF investment program provides an important opportunity to invest in the capacity development of local CSOs, ranging from national NGOs to community-based organizations, to facilitate their emergence as agents of change and credible partners to government and private sector partners.

One of the lessons learned of the first phase of CEPF investment was the need to link grant making to capacity building, especially when working with small, emerging CSOs. To this end, capacity building under this strategic direction will complement the small grant making to local CSOs that will take place throughout the investment strategy as a whole. Both strategies are essential elements of facilitating the emergence of local conservation movements in the hotspot countries but neither is sufficient alone. Small grants not linked to capacity building can ignite a certain level of enthusiasm and energy in recipient organizations but this can be dissipated unless they can build a reputation for sound programmatic and financial management and attract funding from other sources. Capacity building without resources prevents CSOs from applying their new capabilities. Therefore, capacity building activities under this strategic direction will be closely coordinated with the overall development of the grant portfolio, with the RIT playing the key coordinating role. To this end, grants will be awarded to a mixture of CSOs in need of capacity building and local and international service providers, able to provide training, mentoring and/or networking for groups of CSOs with common capacity needs. Specific emphasis will be placed on strengthening Indigenous People's organizations, women's groups and youth groups and engaging them in conservation of globally threatened species, priority sites and conservation corridors. To help manage the volume of applications from CSOs for capacity building grants, other grant-making modalities may be considered in addition to open calls for proposals, including restricted, competitive calls, and grants by invitation.

Investment Priority 4.1 Strengthen the capacity of local civil society organizations in financial, institutional and project management, organizational governance, and fundraising

As seen in Chapter 7 and throughout the consultation process, although some CSOs are fully involved in natural resource management, they lack the necessary knowledge to manage conservation projects, notably conceiving, implementing and monitoring the implementation of projects. Specifically, many groups lack the capacity to design projects and write funding proposals to the standard required by international donors. Local CSOs often also lack the capacity to manage project funds according to donor requirements, since their staff have generally not received any formal training in financial management. To effectively engage these organizations as partners in conservation and sustainable development, there is a fundamental need to strengthen their core capacity in the areas of financial and institutional management, strategic planning, organizational governance, and fundraising. There is also the issue of good governance in financial management of funds generated by the projects. It is common in the region to witness corruption at the local level, notably unequal sharing of cost and benefits. Vulnerable groups like Indigenous People are often neglected when it comes to benefit-sharing, and priority will be given to capacity building initiatives that target Indigenous People's organizations.

As part of this investment priority, CEPF will support independent community-based organizations to improve their capacities, notably by improving their governance structures and accounting systems. It will be important to support decentralized civil society structures, to effectively involve local and vulnerable groups like indigenous communities stakeholders in natural resource management, establish a foundation for equitable benefit-sharing mechanisms, and avoid over-emphasizing the development of a professional class of national NGOs that can become a barrier to the growth of grassroots civil society, as has been seen in some other hotspots where CEPF operates. Taking on board experience from the first phase, priority will be given to mentoring arrangements and other innovative approaches, as opposed to conventional training courses.

Investment Priority 4.2 Establish and strengthen women-led conservation and development organizations, associations and networks to foster gender equality in natural resource management and benefit sharing

Because of the patriarchal nature of most cultures in the hotspot, women are not often involved or included in decision making related to natural resource management and development projects. In fact, until very recently, conservation of biodiversity was seen as an all-male pursuit, and this is reflected in the composition of leadership positions within conservation NGOs. Until recently women's potential contributions to both natural resource management at the grassroots level and conservation practice at the national level had been hardly harnessed, due to disempowerment on issues such as insecure land tenure rights, limited opportunities in decision-making, lack of access to education, and inadequate training and career development opportunities.

Luckily, there is a glimmer of hope, because most of the hotspot countries are increasingly discovering the important contributions that women can make to conservation and sustainable livelihood projects, while the policy environment and societal attitudes are gradually becoming more supportive of women's participation and leadership. Through the activities of regional and national women's groups and networks, such as the Network of African Women for Sustainable Development (REFADD), and line ministries in charge of Women's Affairs, the vital role of women in conservation is increasingly being showcased through some important pilot projects. For example, some small grants schemes, such as CARPE and PPI, have not only supported women's groups to implement biodiversity conservation and rural development activities on the ground but have also acted as an instrument through which women have influenced numerous policies that are currently supporting women-led conservation actions.

To reinforce these positive trends, CEPF will strengthen the capacity of women's groups to advocate for natural resources management and development rights, especially gender equality. CEPF will also provide training to support women-led CSOs to address some institutional issues that do not favor women's participation in biodiversity conservation in priority sites. These activities could be linked to investments under Investment Priority 1.3 on sustainable livelihood and job creation activities. Livelihood activities that present especially good opportunities for participation by rural women include sustainable harvesting, value addition and marketing of NTFPs.

Investment Priority 4.3 Strengthen the communication capacity of local civil society organizations in support of their mission and build public awareness on the importance of conservation outcomes

Strategic communication is one of the major components of conservation programs, especially where they are competing with other development visions for the attention of decision makers and local communities. Stakeholders reported, however, that most conservation programs do not allocate sufficient time and resources to generating and disseminating information about the importance of species and ecosystems in locally appropriate formats. In addition, experience from the first phase of CEPF investment in the hotspot revealed a need to move beyond conventional environmental education and outreach efforts, which have not proven to be very successful. To address this gap, CEPF will fund activities that strengthen the communication capacity of local CSOs, so they can build awareness of the importance of conservation outcomes among key audiences at local, sub-national and national levels. This capacity building will potentially cover a range of media, including scientific journals, policy and technical briefs, radio and television programs, newspapers and online media. CEPF will also support sensitization workshops to create public awareness on the importance in the conservation of conservation projects. Peer-to-peer education and social marketing will also be among the tools that CSOs could receive capacity building in, as they can be particularly appropriate to the catalyzing the types of behavioral change and consumer demand reduction needed to respond to threats such as poaching and wildlife trade.

It will also be very important to strengthen local CSOs' capacity to document and exchange experiences, lessons learned and innovative approaches both internally within their own organizations, and externally among peer CSOs. While much of this exchange among CSOs will take place within countries, CEPF will also take advantage of the regional nature of the investment program by facilitating exchange among CSOs in different hotspot countries working on similar themes. This will not only prevent other civil society actors from repeating approaches that have failed or not been useful elsewhere, but will also facilitate scaling up of experiences, lessons learned and success stories in other sites. This will enable actors to quickly achieve their conservation outcomes in a cost effective way.

Finally, that capacity of CSOs to disseminate the results of their demonstration projects to decision makers in the public and private sectors will be strengthened. Drawing on experience from other hotspots, building alliances of CSOs, including Indigenous People's organizations and women's groups, working on similar issues, who can communicate with these audiences in a coordinated fashion, has proven to be an effective strategy. This type of capacity building support will facilitate the biodiversity mainstreaming into public policy and private sector practice that is envisioned under Strategy Direction 3, drawing on results of demonstration projects supporting under Strategic Directions 1 and 2.

Strategic Direction 5. Provide strategic leadership and effective coordination investment through a Regional Implementation Team

As can already be seen from the interdependencies that exist among different elements of the investment strategy, and the need to integrate grant making with capacity building, development of a grant portfolio whose impacts are greater than the sum of its parts will require strategic leadership and effective coordination. While the CEPF Secretariat will provide overall strategic oversight and ensure compliance with all policies and requirements, such leadership and coordination can be most effectively provided by an organization or organizations with a permanent presence the hotspot. This will also help ensure the sustainability of the program, by building a repository of know-how, experience and contacts that will endure beyond the end of the investment period. To this end, CEPF will implement its grant program in close collaboration with a Regional Implementation Team (RIT). The RIT will help promote and manage grant-making process, undertake key capacity-building, maintain and update data on conservation outcomes. It also will provide leadership to promote the overall conservation outcomes agenda to government and other stakeholders. The detailed terms of reference for the RIT can be found on CEPF's website: www.cepf.net.

Investment Priority 5.1 Operationalize and coordinate CEPF's grant-making processes and procedures to ensure effective implementation of the investment strategy throughout the hotspot

For large grants, the RIT will assist the CEPF Secretariat by reviewing and processing grant applications, ensuring compliance with CEPF policies, and facilitating on-time and accurate grantee and portfolio reporting and monitoring. In particular, the RIT will play a very important role in soliciting and reviewing proposals. This role encompasses a wide range of activities, from issuing calls for proposals to establishing review committees to making final recommendations for approval or rejection. These tasks require technical expertise, knowledge of strategy, and the ability to understand that all selected projects will make a unique contribution to the achievement of CEPF's objectives.

The RIT will also assume responsibility for management of the CEPF small grants mechanism in the hotspot, including budgeting, processing proposals, contracting grants and monitoring impacts. Small grants play an extremely important role in the CEPF portfolio. They can address themes or geographic areas of importance, serve as planning grants, or provide opportunities to engage local and grassroots groups that may not have the capacity to implement large grants. The strategic role that these grants play cannot be underestimated, and the RIT will be responsible for strategic oversight of the small grants portfolio to ensure coherence with the overall grant portfolio, will decide on the award of all grant applications. As mentioned in Section 11.2, in order to address the needs of local CSOs in the hotspot, the maximum small grant size will be set at USD 50,000, although the RIT will have the option of awarding small grants of a range of sizes.

The RIT will also be responsible for montiroing and reporting on portfolio performance, ensuring compliance with reporting requirements, ensuring that grantees understand and comply with social and environmental safeguard policies, and reviewing reports. To this end, the RIT will undertake site visits to grants, to identify needs for follow-up capacity building. This will ensure effective project implementation and monitoring, and requires technical expertise to be performed effectively and inform adaptive management.

Investment Priority 5.2 Build a broad constituency of civil society groups working across institutional and political boundaries to achieve common conservation objectives

The RIT will also perform programmatic duties that directly support strategic development of the grant portfolio and contribute in their own right to the achievement of conservation results that yield portfolio-wide benefits. Such duties will include facilitating learning exchanges among grantees and other stakeholders, identifying leveraging opportunities for CEPF, and aligning CEPF investment with investments by other donors. These functions will require the RIT to maintain in-house conservation expertise to ensure that CEPF funds are strategically channeled to optimize the achievement of its conservation objectives. They will also require the RIT to foster collaboration and build networks among CSOs, thereby responding to lessons learned from the first investment phase, which pointed to the value of such networks in avoiding duplication of effort and maximizing conservation results.

The objectives of this investment priority are mainly to coordinate and communicate CEPF investment, build partnerships and promote information exchange in the priority sites and conservation corridors. It will also support capacity building, a function that is regarded as being at the core of the RIT's responsibility. While complementary forms of capacity building will be supported under Strategic Direction 4, the RIT will play an active role in building the capacity of local CSOs to access and make effective use of CEPF funding. Ensuring that partners have the institutional and individual ability to design and implement projects that contribute to the targets of the investment strategy is not capacity building for its own sake; rather, it is essential to the delivery of CEPF's global mission of engaging and strengthening civil society, and to the delivery of other elements of the investment strategy. Experience from earlier CEPF investments in the hotspot has shown that these capacity building efforts are essential to ensuring good projects that are integrated into a wider hotspot strategy and a common conservation vision. Capacity building for CSOs in project design, implementation and reporting will also help them access funding from other available donors, thereby enhancing the sustainability of the impacts of CEPF funding.

13. SUSTAINABILITY

One of the major findings of the consultation process was that some conservation projects in the hotspot were ultimately unsuccessful, despite initial success in some cases, because they did not incorporate long-term financing mechanisms as a strategy to sustain biodiversity conservation actions on the ground. Also, some conservation initiatives and key stakeholders lacked the necessary human capacity, policies and legislative and regulatory frameworks to drive the process and create real impact in the field. Unfortunately, when this happens, funds are wasted, time is lost, hard-earned results crumble, and, above all, local and indigenous populations are discouraged from participating in future conservation initiatives.

Most stakeholders consulted during the preparation of the ecosystem profile emphasized the need to emphasize sustainability in the design of individual projects and the portfolio as a whole. A strong focus on sustainability will ensure that the impacts of CEPF-funded projects continue to be felt after funding ends. Above all, building partnerships with other donors, government agencies and private sector actors to leverage funds, train conservation actors, and reform and better implement policies was felt to be a very important component of any sustainability strategy. Other components of the sustainability strategy for CEPF in the hotspot included establishment of sustainable financing mechanisms, capacity building for local civil society at individual, organization and network levels, and mainstreaming of results into policy, legislative and regulatory frameworks. The following sections consider each of these components in turn.

13.1 Building Strategic Partnerships

It is immediately apparent from a comparison of the number of conservation outcomes in the hotspot (Chapter 4), the intensity of the threats facing them (Chapter 8) and the level of resources available (Chapter 10) that CEPF cannot hope to address more than a fraction of the conservation actions required for the 137 identified KBAs, all of which are global priorities for biodiversity conservation. To elicit a response at a level commensurate with the scale of the challenge, CEPF will need to build strategic partnerships for conservation and sustainable management of biodiversity with other donors, as well as with governments and private companies.

Within the investment strategy, Investment Priority 2.3 focuses on facilitating partnerships among local communities, private sector and government to demonstrate best practice models in the three priority sectors addressed by CEPF investment: agriculture; mining; and forestry. This is complemented by the other investment priorities under Strategic Direction 2, which aim to empower civil society to influence governments to recognize the values of natural ecosystems and reflect them in their policies and decisions, including with regard to budgetary allocations for conservation finance.

Beyond the use of grants to facilitate strategic partnerships between civil society and other sectors, the CEPF Secretariat and RIT will need to work closely together to forge strategic partnerships with some of the other major donor-funded initiatives in the hotspot. One such initiative is the WA-BiCC program of USAID, implemented by TetraTech, which has a similar geographic focus to the CEPF investment, and an overlapping thematic focus, including conservation of mangroves and coastal areas, which are represented in several priority sites and conservation corridors. The WA-BiCC program has a dedicated componend focused on engaging and strengthening civil society organizations, which is an area with significant potential for collaboration with CEPF, in order to deliver support to CSOs in a coordinated manner that reduces transaction costs and increases accessibility to local groups. Dialogue with the program to explore these opportunities further is underway. There area also significant opportunities for collaboration with the USAID-funded PROSPER project in Liberia, which addresses community management of forest resources. As this project ends in 2017, the immediate opportunities for collaboration may relate to capturing lessons learned and incorporating them into CEPF's grant making, as well as to exploring potential strategic partnership with a possible future phase of the project.

There is also potential for strategic partnership with the German government, which is providing significant support to the protected area systems of several hotspot countries, including Benin, Cameroon and Côte d'Ivoire, through GIZ and KfW. CEPF investments could complement this support, in particular by engaging civil society partners, supporting activities outside of protected areas that alleviate pressure on their core zones or enhance ecological connectivity among them, and supporting initiatives that integrate protected areas into sectoral development plans and policies. The CEPF Secretariat plans to visit Germany in January 2016 to explore possibilities for partnership further.

Similar opportunities for strategic partnership exist with the French government, which is supporting a range of protected area and community-based conservation initiatives across the hotspot, including in Benin, Ghana, Liberia and Sierra Leone, through FFEM. Again, CEPF investments could complement those of the French government by engaging and strengthening civil society actors and supporting conservation actions outside of protected areas to enhance ecological connectivity within the conservation corridors. In addition, CEPF is in a position to sustain or amplify conservation models piloted under the PPI, which has restrictions on the size and duration of the support it is able to provide.

Finally, CEPF will explore opportunities for collaboration and alignment with the EU Wildlife Conservation Strategy for Africa. The synthesis report released in November 2015 (European Commission 2015) proposes a strategic EU response to wildlife conservation in Africa, particularly in light of the current poaching crises driven by the illegal trade in wildlife and wildlife products. The report proposes nine categories of indicative priority conservation actions, five of which are directly addressed by the CEPF investment strategy for the Guinean Forests Hotspot: *in situ* support for key landscapes for conservation and important individual sites (by Strategic Direction 1); facilitating legal reforms for local ownership and rights to wildlife and natural resources (by Strategic Direction 2); tackling indirect threats to conservation (by Strategic Direction 2); research and monitoring (by Investment Priority 3.2); and awareness raising and communication (by Investment Priority 4.1). The CEPF Secretariat will liaise closely with the team with Directorate General for International Cooperation and Development to explore ways of using the ecosystem profile to guide EU investment under the strategy in the West Africa region.

13.2 Institutionalization through Improved Policy and Legislative Frameworks

Strategic Direction 2 explicitly addresses the need identified by stakeholders to mainstream biodiversity conservation into public policy and private sector practice at local, sub-national and national levels. This is included as a major focus for CEPF investment, because integrating biodiversity conservation into the overall policy landscape for economic development and climate change response is key to sustainability. Without this, biodiversity conservation will remain a low public policy priority. Some of the specific areas where biodiversity provisions are most needed include the policies and legislation governing land tenure and the agriculture, mining, and forestry sectors. Reforming policy or legislation in any given sector requires a participatory and multidisciplinary approach, since any revisions will directly or indirectly affect biodiversity conservation in other sectors.

Success stories of pilot projects and lessons learned at local level should not only be documented and shared but also used to facilitate policy and legislative reforms to ensure wider impact than can be achieved by individual projects. This will be a role for the RIT, which will be tasked with developing channels to feed relevant experience from the CEPF grants portfolio into ongoing policy and legislative reform processes, and is also the explicit purpose of Investment Priority 2.1. Moreover, since governments in the hotspot often design sectoral policies and laws that affect local development and biodiversity conservation, it will be necessary to ensure that the grant portfolio developed in each country aligns with relevant national and regional institutional arrangements and strategies, such as Readiness Preparation Proposals (R-PPs), National REDD+ Strategies and NBSAPs. Where possible, CEPF investments should inform these strategies, which will require funding proposals to be screened for their policy relevance, and relevant experience gained through implementation to be captured and disseminated to relevant audiences through case studies, policy briefs, study visits, small-group briefings and other appropriate means. As a starting point for promoting alignment between CEPF investments and national strategies for conservation and sustainable development, the expected contributions of the CEPF investment portfolio in the Guinean Forests Hotspot to the Aichi Targets and the SDGs are set out in Appendix 12.

Good governance structures for natural resource management and conservation should also be institutionalized. Correctly done, decentralization of the management of biodiversity will devolve decision-making powers and ensure accountability, particularly at the local level. However, experience from some countries suggests that decentralized structures that do not receive adequate decision-making powers tend not to function well, while some decentralized structures with greater decision-making power are not necessarily accountable to local communities, because they take their direction from the center. It will, therefore, be very important to support local institutions, where real decision-making powers abound and which are downwardly accountable to local populations.

13.3 Sustainable Financing

In order for conservation projects to produce results and create sustainable impact on the ground, it is important to conceive and implement a long-term vision for support to civil society engaged in conservation in the Guinean Forests Hotspot, as well as institutional structures that will encourage donors other than CEPF to fund conservation projects in the hotspot. Although some existing small grants mechanisms are operating in the region, including the GEF-SGP, PPI and IUCN/CARPE small grants, they are not sufficient to meet the high demands for conservation funding from CSOs and government institutions. Nevertheless, it will be essential that any sustainable financing mechanism developed with support of CEPF complement and, where possible, cooperate with existing mechanisms, to avoid duplication and to provide a diversity of financing that responds to different needs.

It will be necessary to design and implement innovative sustainable funding schemes where international/national donors, governments, private sector and even local entrepreneurs will commit to providing long-term funds to ensure the attainment of conservation outcomes in the hotspot. CEPF will work closely with other donors to leverage its investments, with the aim of encouraging long-term financial commitments by donors; creating self-sustaining community-based enterprises (e.g. community forests, producer cooperatives, ecotourism ventures, etc.); facilitating partnerships with private companies in support of community-led initiatives for ecosystem conservation and restoration (such as those envisioned under Investment Priority 2.3); and facilitating public government funding (such as proposed under Investment Priority 2.1). It will be especially important to closely work with governments in the protection of priority KBAs, especially those designated as protected areas, because they are likely to be the main source of continued funding in most cases (i.e., for forest guards, park infrastructure, ecotourism development, etc.). It will also be very important for conservation NGOs to pool their efforts and resources together to work collaboratively, to engage different partners and donors in support of a common conservation agenda, rather than compete with one another for resources and influence. This is the explicit focus of Investment Priority 5.2.

13.4 Capacity Building

Enhancing individual and institutional capacities is a cross-cutting priority theme that was recommended by various stakeholders during the consultation process. Chapter 10 highlights the need to train local communities, and national NGOs, government agencies and elected representatives to better understand their roles, responsibilities and interests in piloting conservation projects. The investment strategy responds to this by including Strategic Direction 4, which has an explicit focus on capacity building for local CSOs, especially Indigenous

People’s, women’s and youth groups. This will be complemented by capacity building provided by the RIT under Strategic Direction 5, to enable CSOs, especially newer organizations and grassroots groups, to access CEPF funds, and design and implement effective conservation actions. In addition, it can reasonably be expected that capacity building will be integrated into many of the grants awarded under other strategic directions, in order to facilitate the emergence of a stronger conservation-focused civil society at national and regional levels that can sustain and build upon the results of the next five years of CEPF investment.

GUINEAN FORESTS OF WEST AFRICA LOGICAL FRAMEWORK: 2016-2020

Objective	Target	Means of Verification	Important Assumptions
Engage civil society in the conservation of globally threatened biodiversity through targeted investments with maximum impact on the highest conservation priorities.	At least 60 local communities are empowered to engage in the sustainable management of priority sites and/or consolidate ecological connectivity at the landscape scale. At least 20 Key Biodiversity Areas targeted by CEPF grants have new or strengthened protection and management. At least 100,000 hectares within production landscapes are managed for biodiversity conservation or sustainable use. Public policies and/or private sector business practices in at least 6 conservation corridors incorporate provisions for biodiversity conservation. Populations of at least 30 globally threatened species targeted by CEPF grants are stable or increasing. At least 15 networks are formed among civil society, government and private sector actors to facilitate capacity building, avoid duplication of effort and maximize impact. At least 50 civil society organizations, including at least 10 Indigenous People's, women's and/or youth groups, demonstrate improvements in organizational capacity. Investment strategies of at least 2 other donors active in the Guinean Forests incorporate geographic and/or thematic priorities from the ecosystem profile.	Grantee and Regional Implementation Team performance reports. Annual portfolio overview reports. Portfolio midterm and final assessment reports. Protected Area Tracking Tool (SP1 METT). IUCN Red List of Threatened Species. Civil society organizational capacity tracking tool. Strategies and reports of other donors.	The CEPF ecosystem profile effectively guides and coordinates conservation action in the Guinean Forest Hotspot. Stakeholder interest remains stable or increases with respect to working in partnership with civil society organizations to achieve conservation outcomes. Investments by other funders support complementary activities that reduce threats to priority corridors, sites and species, and improve the operating environment for civil society. Regulatory and institutional environments for conservation and civil society engagement remain stable or improve over time. Implementation of conservation initiatives and operations of civil society organizations are not prevented by political instability, public health emergencies or other crises.

Intermediate Outcomes	Intermediate Indicators	Means of Verification	Important Assumptions
Outcome 1: Local communities are empowered to engage in sustainable management of 40 priority sites and consolidate ecological connectivity at the landscape scale. $3,000,000	At least 15 local land-use plans elaborated and implemented to facilitate good governance in the management of community and private reserves and concessions. At least 10 local and indigenous communities are trained to initiate and advocate for land tenure and forestry reforms in relation to management of community and private reserves and concessions. At least 10 participatory management plans that support stakeholder collaboration in Protected Area management are prepared and implemented. At least 30 local communities targeted by sustainable livelihood/job creation activities or benefit-sharing mechanisms show tangible wellbeing benefits.	Official land-use plans. Pre- and post-activity training needs assessment reports. Approved participatory management plans. Human wellbeing monitoring reports. Grantee and Regional Implementation Team performance reports. Secretariat supervision mission reports.	Local communities are willing to play an active role in site-based conservation. Local governments are receptive to participation of local and indigenous communities in reform and implementation of policies related to land and natural resource management. Government policies continue to provide for participatory management of protected areas. Appropriate, cost-effective protocols for monitoring human well-being impacts can be developed.
Outcome 2: Biodiversity conservation mainstreamed into public policy and private sector practice in the nine conservation corridors, at local, sub-national and national levels. $2,000,000	At least 5 conservation-related policies of national governments are informed or influenced by research, analysis and outreach supported by CEPF grants. Locally-relevant information on natural ecosystems is generated for at least 20 key biodiversity areas and used to influence political and economic decision-making in favor of their conservation At least 20 partnerships are formed or strengthened among civil society, government, private sector and communities to promote best practices in mining, sustainable forestry and agriculture by private companies. At least 5 private companies adopt new management practices consistent with biodiversity conservation at operations in the conservation corridors.	National government conservation policies. Reports on the values of natural ecosystems. Partnership agreements. Corporate sustainability strategies, annual reports and media. Grantee and Regional Implementation Team performance reports. Secretariat supervision mission reports.	Governments and companies remain committed to sustainable development goals. Governments create space for civil society to engage in policy reform processes. Economic decision making can be influenced by arguments about the values of natural ecosystems. Sufficient civil society capacity to undertake biodiversity mainstreaming exists or can be built.

Intermediate Outcomes	Intermediate Indicators	Means of Verification	Important Assumptions
Outcome 3: Priority globally threatened species are safeguarded by identifying and addressing major threats and information gaps. $1,200,000	Priority actions identified in Conservation Action Plans are implemented for at least 15 Critically Endangered and Endangered species. The inventory of Key Biodiversity Areas in the hotspot is updated to fill critical information gaps, particularly with regard to the Lower Guinean Forests subregion, and freshwater ecosystems. The global conservation status of at least 100 species from poorly assessed taxonomic groups is updated or assessed for the first time on the IUCN Red List.	World Bird and Biodiversity Database. IUCN Red List of Threatened Species. Grantee and Regional Implementation Team performance reports. Secretariat supervision mission reports.	Sufficient civil society capacity to conceive and implement species conservation actions exists or can be built. The main causes of declines in specific species populations are amenable to conservation action and can be addressed within the timeframe of the investment. Organizations and individuals holding data on species and sites are willing to share it.
Outcome 4: Capacity of local civil society organizations, including Indigenous People's, women's and youth groups built to conserve and manage globally important biodiversity. $1,300,000	At least 50 local civil society organizations, including at least 10 Indigenous People's organizations, demonstrate strengthened capacity with regard to financial, institutional and project management, organizational governance, and fundraising. At least 20 women-led conservation and development organizations, associations and networks are established and strengthened to foster gender equality in natural resource management and benefit sharing. At least 20 local civil society organizations demonstrate increased communication capacity in ways that support the delivery of their mission.	Pre- and post-activity training needs assessment reports. Civil society organizational capacity tracking tool. Grantee and Regional Implementation Team performance reports. Secretariat supervision mission reports.	Civil society actors are able to work collaboratively to respond to conservation challenges. The operating environment for civil society remains constant or improves across the hotspot Key capacity limitations of civil society organizations can be addressed through trainings, mentorship and other activities suitable for grant support. Civil society organizations are able to retain trained staff who benefit from capacity building opportunities.

Intermediate Outcomes	Intermediate Indicators	Means of Verification	Important Assumptions
Outcome 5: A Regional Implementation Team provides strategic leadership and effective coordination of CEPF conservation investment in the Guinean Forests Hotspot. $1,500,000	At least 60 civil society organizations, including at least 30 local and indigenous NGOs actively participate in conservation actions guided by the ecosystems profile. At least 85 percent of local NGOs receiving grants demonstrate more effective capacity to design and implement conservation actions. At least 5 civil society organizations supported by CEPF secure follow-up funding to promote the sustainability of their CEPF grants. At least $1 million in additional funding is leveraged from other donors towards the priorities set in the ecosystem profile. At least 2 participatory assessments are undertaken and documented.	Civil society organizational capacity tracking tool. Portfolio midterm and final assessment reports. Grantee and Regional Implementation Team performance reports. Secretariat supervision mission reports. Strategies and reports of other donors.	Suitably qualified organizations will apply to serve as the Regional Implementation Team in line with the approved terms of reference and the ecosystem profile. Calls for proposals will elicit appropriate proposals that advance the goals of the ecosystem profile. Civil society organizations will collaborate with each other, other donors, government agencies, and private sector actors in a coordinated regional conservation program in line with ecosystem profile.
Funding Summary	**Amount**		
Total Budget	$9,000,000		

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Appendix 1: Overview of Terrestrial Ecoregions within the Guinean Forests of West Africa Hotspot

Ecoregion	Threat status	Geographic notes	Major habitat(s) and defining features
Upper Guinean Forests Subregion			
Cross-Sanaga-Bioko Coastal Forests	Vulnerable	Extending from the left bank of the Cross River in southeastern Nigeria, following the coast as far south as the Sanaga River in Cameroon, and extending inland up to 300 km. It also includes the lowland forests of the island of Bioko.	Comprising lowland and coastal forest habitats, the biogeographical barriers of the Sanaga River in Cameroon and the Cross River in Nigeria define the mainland boundaries of this ecoregion.
Eastern Guinean Forests	Critical	Stretching from Sassandra River in western Côte d'Ivoire, and east to Lake Volta in Ghana. The Dahomey Gap defines the far eastern border of the ecoregion.	Tropical and subtropical broadleaf forests are the primary habitat of this ecoregion. The forest grades from the south to north from moist evergreen, to moist semi-evergreen, to dry semi-evergreen in the north of the ecoregion.
Guinean Montane Forests	Critical/ Endangered	Spanning four countries in the Upper Guinean Forests subregion: from Guinea in the north and northwest to Côte d'Ivoire in the east. Patches also occur in Sierra Leone and Liberia	High altitude peaks and plateaus of the four associated countries, delimited by a lower altitude of 600m.
Western Guinean Lowland Forests	Critical/ Endangered	Comprising a significant proportion of the whole (western) Upper Guinean Forests subregion, this ecoregion spans from eastern Guinea, across Sierra Leone and Liberia, to the Sassandra River in southwestern Côte d'Ivoire.	Seemingly contiguous with the Eastern Guinean Forest ecoregion, a biogeographical distinction is made due to the differences in certain species groups, in particular amphibians, duikers, lizards and primates.
Lower Guinean Forests Subregion			
Cameroonian Highlands Forests	Critical/ Endangered	Covers the mountains and highland areas of the border region between Nigeria and Cameroon. This ecoregion includes the Rumpi Hills, the Bakossi Mountains, Mount Nlonako, Mount Kupe and Mount Manengouba.	Comprises tropical and subtropical moist broadleaf forests in a non-volcanic, montane region. Lower boundaries are determined by agricultural lands.
Cross-Niger Transition Forests	Critical/ Endangered	Separated by the Cross River to the east from the Cross-Sanaga-Bioko Coastal Forests, and by the Niger River in the west from the Nigerian Lowland Forests.	The transitional ecoregion between the Forest types of the two subregions. Remnant forests with low species richness and endemism relative to adjacent ecoregions. Biota reflects a transition between the Upper and Lower Guinean Forests subregions
Mount Cameroon and Bioko Montane Forests	Critical/ Endangered	Parts of a volcanic chain that extends northeast along the border between Cameroon and Nigeria, and southwest towards the Guinean islands of Annobón, Bioko, São Tomé and Príncipe.	Considered distinct from the associated Cameroonian Highlands Forests ecoregion due to the younger geological age, and the consequent absence of certain restricted range species.

Ecoregion	Threat status	Geographic notes	Major habitat(s) and defining features
Niger Delta Swamp Forests	Critical/ Endangered	Delineated by the Benin and Imo Rivers forming its western and eastern boundaries, respectively.	The second largest swamp forests on the continent, this ecoregion is considered biologically distinct due to the presence of endemic mammal subspecies: Pennant's red colobus (*Procolobus pennantii pennantii*) and Heslop's Pygmy Hippo (*Choeropsis liberiensis heslopi*).
Nigerian Lowland Forests	Critical/ Endangered	Forming a band along the coast in southwestern Nigeria, from the eastern margin of the Dahomey Gap in Benin to the Niger River in the west.	A dry lowland forest, notable for the endemic White-throated Guenon (*Cercopithecus erythrogaster*). Considered distinct from the drier Dahomey Gap to the west and the Niger River Delta to the east.
São Tomé, Príncipe and Annobón Moist Lowland Forests	Vulnerable	Covering the three volcanic islands: Annobón, São Tomé and Príncipe.	Notable for high endemism (particularly relative to its size), including several endemic genera and families, and for evolutionary features among its biota, including examples of gigantism, dwarfism and unusual ecological, physiological and behavioral adaptations in some species.

Appendix 2: Freshwater Ecoregions within the Guinean Forests of West Africa Hotspot

Ecoregion	Conservation Status	Geographic Notes	Major habitat(s) and defining features	Occurrence within the hotspot
Upper Guinean Forests Subregion				
Ashanti	Endangered	Ranges from Ghana's southwestern corner and includes a small portion of Côte d'Ivoire's southeast	Tropical and subtropical coastal rivers, within semi-deciduous, moist evergreen, and wet evergreen rainforest (much of which has now been cleared) and mangroves. Fish fauna is primarily Nilo-Sudanian.	High. Occurs almost exclusively within the hotspot boundary in the Upper Guinean Forests subregion.
Eburneo	Endangered	Located mainly in Côte d'Ivoire spanning most of the country, extending north to Southern Burkina Faso, and east to small areas of Western Ghana.	Tropical and subtropical coastal rivers, stretching from Sudanian savanna woodland in the north, to a forest-savanna mosaic, and down to Guinean rain forest in the south. The largest rivers being Comoé, Bandama and Sassara Rivers.	Medium. Occurs largely in Northern Côte d'Ivoire with roughly half of the ecoregion within the Upper Guinean Forests subregion.
Fouta-Djallon	Vulnerable	Located in Central Guinea, and is defined by the Fouta Djallon Plateau.	Mountain freshwaters. Mountainous area with sections of elevated plateau (600-1500m) separated by deep gorges through which rivers and gorges descend. Rivers isolated from downstream by waterfalls and rapids. Upland area of Fouta-Djallon plateau dominated by submontane vegetation surrounded by forest/savanna transition. Includes the headwaters of the Senegal and Niger Rivers.	High. The majority of his ecoregion is found within the Upper Guinean Forests subregion.
Mount Nimba	Endangered	This is a mountainous region, which is located at the intersection between Guinea, Côte d'Ivoire and Liberia. Mount Nimba forms the southern extent of the "Guinean Backbone".	Montane freshwater systems with surrounding variable surrounding habitats as a function of elevation. This varies from plains savannah (500m), forests dominated by epiphytes (850m), to grasslands on the summit (850m). The steep slopes of Mount Nimba lead to swift running rivers.	Medium. Roughly half of the ecoregion Mount Nimba is located within the hotspot boundaries.

Ecoregion	Conservation Status	Geographic Notes	Major habitat(s) and defining features	Occurrence within the hotspot
Northern Upper Guinea	Endangered	Lies on the western side of the Guinean range, and stretches from the foothills of Fouta Djallon in Guinea to Sierra Leone's southern border. Small portions of the ecoregion lie in Guinea-Bissau and Liberia.	Tropical and subtropical coastal rivers, with an intricate hydrological network. Floodplain lakes surrounded by extensive areas of swamp forests. Mangroves backed by freshwater swamp forests are found along most of the coast and in riverine estuaries.	Medium. The ecoregion extends to western Guinea and eastern Guinea- Bissau which are outside the hotspot boundaries, with the southeastern part including most of Sierra Leone lying within the hotspot.
Southern Upper Guinea	Endangered	The ecoregion covers nearly all of Liberia, a portion within southern Guinea and south western part of Côte d'Ivoire.	Relatively short, an partly torrential tropical and subtropical coastal rivers with drainages flowing into the Atlantic Ocean. Few floodplains are found in the ecoregion. Mangrove forests and swamps occur near the mouths of the rivers.	Very High. Occurs exclusively within the hotspot boundary within the Upper-Guinea sub region.
Upper Niger	Vulnerable	This ecoregion lies primarily within the countries of Guinea and Mali, and has two smaller portions in Burkina Faso and Côte d'Ivoire.	Tropical and subtropical upland rivers. The two rivers, The upper Niger and its tributary, and the Baniriver together define this ecoregion. Due to the high rainfall and topography of Fouta Djallon and central Guinean highlands the steep rivers and streams of the Upper Niger ecoregion are fast-flowing. The Upper Niger has relatively clear water with low sediment load.	Very Marginal. The vast majority of this ecoregion lies north of the hotspot boundaries. The portion within the hotspot is lies in southeastern Guinea.
Volta	Critical	The Volta River basin extends into parts of 6 countries, with the majority falling within Burkina Faso and Ghana. The ecoregion also stretches into Mali, Côte d'Ivoire, Togo and Benin.	The Volta is one of the largest rivers in West Africa, with major habitats in the ecoregion being subtropical floodplain rivers and wetland complexes created by the many tributaries. During flood season large swampy areas are created.	Very Marginal. The majority of the ecoregion lies north of the hotspot boundaries on the far eastern side of the Upper Guinean Forests subregion.

Ecoregion	Conservation Status	Geographic Notes	Major habitat(s) and defining features	Occurrence within the hotspot
Lower Guinean Forests Subregion				
Bight Drainages	Critical	Spans four countries (Benin, Ghana, Nigeria and Togo). Primarily in the coastal regions of Benin, Togo and western Nigeria, but also includes the southeastern-most point of Ghana.	Tropical and subtropical coastal rivers in an area of relatively dry, savanna habitat (the Dahomey Gap). Low [fish] endemism is a defining feature of the ecoregion, indicating the region's biogeographical history of extinctions during dry phases, and subsequent recolonization by fauna from the river Niger.	Medium. Occurs largely in the Dahomey Gap (outside of hotspot boundary) but also comprises a significant portion of the Lower Guinean Forests subregion (within Nigeria)
Lake Chad	Endangered	Lake Chad lies within Niger, Cameroon, Chad and Nigeria. It is located on the southern edge of the Sahara desert.	An extensive floodplain system in a xeric region, with seasonal river floods and large variation in inundated area. The landscape is a mixture of open water (38%), archipelagoes (23%), and reed belts (39%) during "Normal Chad" periods.	Very Marginal. The entire ecoregion covers a large area within 4 countries with only a small area in the southwestern part situated within the hotspot.
Lower Niger-Benue	Critical	The Niger-Benue system runs through Niger, Mali, Burkina Faso, Guinea, Côte d'Ivoire, Benin and Cameroon. The ecoregion includes the Benue River basin and the lower and middle portions of the Niger River basin below the Inner Niger Delta and above the Niger Delta	Largely savanna ecoregion with tropical and subtropical biannual floodplain rivers, including wetland complexes. High variation of habitat within ecoregion with Niger flowing through dryer parts of Mali to rainforests in southern Nigeria.	Marginal. The majority of the ecoregion lies west of the area within the hotspot, which is situated between Cameroon and Nigeria.
Niger Delta	Critical	The Niger Delta lies entirely in Nigeria, with drainages flowing into the Gulf of Guinea in the Atlantic Ocean. The Benin River and Imo River mouths define the western and eastern boundaries of the ecoregion.	Niger Delta has 3 major sections with distinct habitats: the upper riverine floodplain, lower tidal floodplains, and coastal barrier islands. Permanent and seasonal swamp forests grade into the mangrove forests of the lower tidal floodplain. Bothe black and white water rivers flow into the Niger Delta.	Very High. The entire ecoregion of the Niger Delta lies within the Lower Guinean Forests subregion of the hotspot.

Ecoregion	Conservation Status	Geographic Notes	Major habitat(s) and defining features	Occurrence within the hotspot
Northern Gulf of Guinea Drainages-Bioko	Endangered	The ecoregion lies within the three countries Cameroon, Equatorial Guinea, and Nigeria and encompasses coastal rivers and streams that feed the Gulf of Guinea. Bioko is the largest island in the Gulf of Guinea.	The ecoregion lies within the evergreen forest zone, including the Cameroonian Highlands Forest and Bioko's mountain forests. Major habitats are also reed beds along the rivers and mangroves which occur in the estuaries. Tropical hot-humid climate, with rainfall reaching as much as ten meters per year in southwest Bioko.	High. The majority of the ecoregion falls within the Lower Guinean Forests subregion of the hotspot with the exception of the most northern area which lies in Nigeria.
S. Tomé and Príncipe - Annobón	Vulnerable	Volcanic islands located off the coast of Equatorial Guinea and Gabon. Islands include São Tomé, Príncipe, Annobón and several smaller islands.	Tropical and subtropical coastal rivers, which flow swiftly and are marked by waterfalls and rapids. Rivers descend from highland interiors and flow to the Gulf of Guinea. Rivers are surrounded by lowland forest, montane rainforest and mangrove forest.	Very high. All of the islands of this ecoregion lie within the hotspot boundaries.
Western Equatorial Crater Lakes	Endangered	The ecoregion is situated in southwestern Cameroon, and lies along the "Cameroon Line," a volcanic ridge that runs southwest-northeast.	Montane freshwaters and crater lakes. The main lakes of the ecoregion are BarombiMbo, Bermin, Dissoni, Ejagham, Kotto and Mboandong. Vegetation consists of submontane forests, as well as submontane forests and montane grasslands.	Very high. The ecoregion lies entirely within the hotspot boundaries in the Lower Guinean Forests subregion

Appendix 3: Marine Ecoregions Adjacent to the Guinean Forests of West Africa Hotspot

Ecoregion	Geographic Notes	Major habitat(s) and defining features
Gulf of Guinea Central	extends from the Togo/Benin border to Cape Lopez, Gabon.	Coastal habitat includes huge marshy areas formed by the Niger delta, with mangroves indented by fluvial channels. Productivity depends largely on nutrient input from land and river drainages (i.e. Niger River, Sanaga River).
Gulf of Guinea Islands	extends around the offshore islands of Bioko, São Tomé, Príncipe, and Annobón.	Although these islands are not especially rich in marine species, they have relatively high endemism of bony fishes and marginellid mollusks.
Gulf of Guinea Upwelling	extends approximately from Cape Palmas to the border of Togo/Benin (the exact area can vary seasonally).	Coastal habitat is characterized by low sandy coastal plains with alternating lagoons and estuaries. This ecoregion is characterized by thermal instability due to seasonal (June through September) upwelling of cold, nutrient-rich waters. These periodic upwellings drive seasonal biological productivity in the region.
Gulf of Guinea West	extends from the Bissagos Islands in Guinea-Bissau to Cape Palmas (Liberia/Côte d'Ivoire).	Coastal habitat along Sierra Leone and Liberia is generally characterized by rocky scarps and sandy beaches, alternating with mangrove vegetation. This marine ecoregion is characterized by the largest continental shelf in West Africa, with large riverine input that is partially responsible for its thermal stability, namely warm and stable surface water over a bottom layer of cooler waters exist year round.

Appendix 4: Species Outcomes for the Guinean Forests of West Africa Biodiversity Hotspot

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Principe	Sierra Leone	Togo
	MAMMALS		**65**	**10**	**34**	**20**	**13**	**13**	**20**	**18**	**21**	**5**	**14**	**8**
1	*Acinonyx jubatus*		VU	+										+
2	*Balaenoptera musculus*		EN	+	+	+	+	+			+	+		+
3	*Cephalophus jentinki*	Jentink's duiker	EN			+				+			+	
4	*Cephalophus zebra*	Zebra duiker	VU			+			+	+			+	
5	*Cercocebus atys*		VU			+		+	+	+			+	
6	*Cercocebus torquatus*	Collared Mangabey	VU		+						+			
7	*Cercopithecus diana*	Diana Monkey	VU			+		+	+	+			+	
8	*Cercopithecus erythrogaster*		VU	+							+			+
9	*Cercopithecus erythrotis*	Red-eared Monkey	VU		+		+				+			
10	*Cercopithecus preussi*	Preuss's Monkey	EN		+		+				+			
11	*Cercopithecus sclateri*		VU								+			
12	*Chaerephon tomensis*	São Tomé Free-tailed Bat	EN									+		
13	*Choeropsis liberiensis*	Pygmy Hippopotamus	EN			+			+	+			+	
14	*Colobus polykomos*	Black-and-white Colobus	VU			+			+	+			+	
15	*Colobus satanas*	Black Colobus	VU		+		+							
16	*Colobus vellerosus*		VU	+		+		+			+			+
17	*Crocidura eisentrauti*		VU		+									
18	*Crocidura manengubae*		VU		+									
19	*Crocidura picea*	Cameroonian Shrew	EN		+									
20	*Crocidura thomensis*		EN									+		
21	*Dendromus oreas*		VU		+									
22	*Genetta cristata*		VU								+			

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
23	*Genetta johnstoni*		VU			+		+	+	+				
24	*Gorilla gorilla*	Western Gorilla	CR		+						+			
25	*Hippopotamus amphibius*	Common Hippopotamus	VU	+	+	+		+	+	+	+		+	+
26	*Hipposideros curtus*		VU		+		+							
27	*Hipposideros lamottei*		CR						+					
28	*Hipposideros marisae*		VU			+			+	+				
29	*Hybomys badius*		EN		+									
30	*Hybomys basilii*		EN				+							
31	*Hylomyscus baeri*	Baer's Wood Mouse	EN			+		+					+	
32	*Hylomyscus grandis*	Mount Oku Hylomyscus	CR		+									
33	*Lamottemys okuensis*	Mount Oku Rat	EN		+									
34	*Lemniscomys mittendorfi*		VU		+									
35	*Liberiictis kuhni*	Liberian Mongoose	VU			+				+				
36	*Lophuromys dieterleni*	Mount Oku Brush-furred Rat	EN		+									
37	*Lophuromys eisentrauti*	Mount Lefo Brush-furred Mouse	EN		+									
38	*Loxodonta africana*	African elephant	VU	+	+	+		+	+	+	+		+	+
39	*Lycaon pictus*		EN	+										
40	*Mandrillus leucophaeus*	Drill	EN		+		+				+			
41	*Mandrillus sphinx*	Mandrill	VU		+									
42	*Micropotamogale lamottei*	Mount Nimba Otter Shrew	EN			+			+	+				
43	*Myonycteris brachycephala*	São Tomé Collared Fruit Bat	EN									+		
44	*Myosorex eisentrauti*		CR				+							
45	*Myosorex okuensis*		EN		+									
46	*Myosorex rumpii*	Rumpi Mouse Shrew	EN		+									
47	*Otomys burtoni*	Burton's Vlei Rat	EN		+									
48	*Otomys occidentalis*		VU		+						+			

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
49	*Pan troglodytes*	Chimpanzee	EN		+	+		+	+	+	+		+	
50	*Panthera leo*	Lion	VU	+	+	+		+	+		+			
51	*Physeter macrocephalus*		VU	+	+		+	+	+	+	+	+	+	+
52	*Praomys hartwigi*		EN		+									
53	*Praomys morio*	Cameroon Soft-furred Mouse	EN		+		+							
54	*Praomys obscurus*		EN								+			
55	*Procolobus badius*	Western Red Colobus	EN			+		+	+	+			+	
56	*Procolobus pennantii*	Pennant's Red Colobus	CR				+				+			
57	*Procolobus preussi*	Preuss's Red Colobus	CR		+						+			
58	*Rhinolophus guineensis*		VU			+			+	+			+	
59	*Rhinolophus maclaudi*	Maclaud's Horshoe Bat	EN						+					
60	*Rhinolophus ziama*		EN						+	+				
61	*Sousa teuszii*	Atlantic Humpback Dolphin	VU						+					
62	*Sylvisorex camerunensis*		VU		+						+			
63	*Sylvisorex isabellae*		EN				+							
64	*Sylvisorex morio*	Mount Cameroon Forest Shrew	EN		+									
65	*Trichechus senegalensis*	West African Manatee	VU	+	+	+	+	+	+	+	+		+	+
	BIRDS		**48**	**10**	**23**	**20**	**5**	**17**	**18**	**13**	**18**	**13**	**14**	**10**
66	*Agelastes meleagrides*	White-breasted Guineafowl	VU			+		+		+			+	
67	*Amaurocichla bocagei*	São Tomé Short-tail	VU									+		
68	*Balearica pavonina*	Black Crowned-crane	VU	+	+			+	+		+			+
69	*Bostrychia bocagei*	Dwarf Olive Ibis	CR									+		
70	*Bycanistes cylindricus*	Brown-cheeked Hornbill	VU			+		+	+	+			+	+
71	*Campephaga lobata*	Western Wattled Cuckooshrike	VU			+		+	+	+			+	
72	*Ceratogymna elata*	Yellow-casqued Hornbill	VU		+	+		+	+	+	+		+	+

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
73	*Circaetus beaudouini*	Beaudouin's Snake-eagle	VU		+	+			+		+	+		
74	*Criniger olivaceus*	Yellow-bearded Greenbul	VU			+		+	+	+			+	
75	*Estrilda poliopareia*	Anambra Waxbill	VU	+							+			
76	*Francolinus camerunensis*	Mount Cameroon Francolin	EN		+									
77	*Gyps africanus*	White-backed Vulture	EN	+	+	+		+	+		+		+	+
78	*Gyps rueppellii*	Rueppell's Vulture	EN	+	+	+		+	+		+			+
79	*Kupeornis gilberti*	White-throated Mountain-babbler	EN		+						+			
80	*Lanius newtoni*	São Tomé Fiscal	CR									+		
81	*Malaconotus gladiator*	Green-breasted Bush-shrike	VU		+						+			
82	*Malimbus ballmanni*	Gola Malimbe	EN			+			+	+			+	
83	*Malimbus ibadanensis*	Ibadan Malimbe	EN								+			
84	*Melaenornis annamarulae*	Nimba Flycatcher	VU			+		+	+	+			+	
85	*Morus capensis*	Cape Gannet	VU		+		+				+	+		
86	*Necrosyrtes monachus*	Hooded Vulture	EN	+	+	+		+	+	+	+		+	+
87	*Nectarinia thomensis*	Giant Sunbird	VU									+		
88	*Neophron percnopterus*	Egyptian Vulture	EN	+	+			+	+		+			+
89	*Neospiza concolor*	São Tomé Grosbeak	CR									+		
90	*Oriolus crassirostris*	São Tomé Oriole	VU									+		
91	*Otus hartlaubi*	São Tomé Scops-owl	VU									+		
92	*Phyllastrephus leucolepis*	Liberian Greenbul	CR							+				
93	*Picathartes gymnocephalus*	White-necked Picathartes	VU			+		+	+	+			+	
94	*Picathartes oreas*	Grey-necked Picathartes	VU		+		+				+			
95	*Platysteira laticincta*	Banded Wattle-eye	EN		+									
96	*Ploceus bannermani*	Bannerman's Weaver	VU		+						+			
97	*Ploceus batesi*	Bates's Weaver	EN		+									
98	*Polemaetus bellicosus*	Martial Eagle	VU	+	+	+		+	+		+		+	+

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
99	*Prinia leontica*	White-eyed Prinia	VU			+			+	+			+	
100	*Psittacus erithacus*	Grey Parrot	VU		+	+	+	+			+	+		
101	*Psittacus timneh*	Timneh Parrot	VU			+			+	+			+	
102	*Sagittarius serpentarius*	Secretarybird	VU	+	+	+		+			+			+
103	*Scotopelia ussheri*	Rufous Fishing-owl	VU			+		+	+	+			+	
104	*Speirops brunneus*	Fernando Po Speirops	VU				+							
105	*Speirops melanocephalus*	Mount Cameroon Speirops	VU		+									
106	*Tauraco bannermani*	Bannerman's Turaco	EN		+									
107	*Telophorus kupeensis*	Mount Kupe Bush-shrike	EN		+									
108	*Torgos tracheliotos*	Lappet-faced Vulture	VU	+	+	+								
109	*Treron sanctithomae*	São Tomé Green-pigeon	VU									+		
110	*Trigonoceps occipitalis*	White-headed Vulture	VU	+	+	+		+	+		+			+
111	*Turdus xanthorhynchus*	Príncipe Thrush	CR									+		
112	*Zosterops ficedulinus*	São Tomé White-eye	VU									+		
113	*Zosterops griseovirescens*	Annobón White-eye	VU				+							
	REPTILES		**11**	**4**	**5**	**5**	**6**	**4**	**6**	**5**	**4**	**5**	**5**	**3**
114	*Afroablepharus africana*		VU									+		
115	*Afroablepharus annobonensis*	Annobón Lidless Skink	CR				+							
116	*Chelonia mydas*	Green Turtle	EN				+		+			+	+	
117	*Cnemaspis occidentalis*		EN			+			+	+			+	
118	*Cynisca leonina*		VU						+					
119	*Dermochelys coriacea*	Leatherback	VU	+	+	+	+	+	+	+	+	+	+	+
120	*Eretmochelys imbricata*	Hawksbill Turtle	CR				+					+		
121	*Kinixys homeana*		VU	+	+	+	+	+		+	+			
122	*Lepidochelys olivacea*	Olive Ridley Turtle	VU	+	+	+	+	+	+	+	+	+	+	+

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
123	*Leptosiaphos pauliani*		EN		+									
124	*Osteolaemus tetraspis*	West African Dwarf Crocodile	VU	+	+	+		+	+	+	+		+	+
	AMPHIBIANS		**77**	**0**	**52**	**14**	**1**	**11**	**5**	**4**	**13**	**3**	**2**	**1**
125	*Afrixalus lacteus*		EN		+									
126	*Alexteroon jynx*		CR		+									
127	*Amietophrynus djohongensis*		EN		+									
128	*Amietophrynus perreti*		VU								+			
129	*Amietophrynus taiensis*		CR			+								
130	*Amietophrynus villiersi*		EN		+									
131	*Arlequinus krebsi*		EN		+									
132	*Arthroleptis crusculum*		EN						+					
133	*Arthroleptis krokosua*		EN					+						
134	*Arthroleptis perreti*		EN		+									
135	*Astylosternus diadematus*		VU		+									
136	*Astylosternus fallax*		EN		+									
137	*Astylosternus laurenti*		EN		+									
138	*Astylosternus nganhanus*		CR		+									
139	*Astylosternus perreti*		EN		+									
140	*Astylosternus ranoides*		EN		+									
141	*Astylosternus rheophilus*		VU		+									
142	*Astylosternus schioetzi*		EN		+									
143	*Cardioglossa alsco*		CR		+									
144	*Cardioglossa aureoli*		EN										+	
145	*Cardioglossa melanogaster*		EN		+						+			
146	*Cardioglossa oreas*		EN		+									

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
147	*Cardioglossa pulchra*		EN		+						+			
148	*Cardioglossa schioetzi*		EN		+						+			
149	*Cardioglossa trifasciata*		CR		+									
150	*Cardioglossa venusta*		EN		+									
151	*Conraua alleni*		VU			+			+	+			+	
152	*Conraua goliath*		EN		+									
153	*Conraua robusta*		VU		+						+			
154	*Didynamipus sjostedti*		EN		+		+				+			
155	*Hylarana asperrima*		EN		+						+			
156	*Hylarana longipes*		VU		+									
157	*Hylarana occidentalis*		EN			+		+	+	+				
158	*Hyperolius bobirensis*		EN					+						
159	*Hyperolius dintelmanni*		EN		+									
160	*Hyperolius endjami*		VU		+									
161	*Hyperolius laurenti*		VU			+		+						
162	*Hyperolius nienokouensis*		EN			+								
163	*Hyperolius nimbae*		EN			+								
164	*Hyperolius riggenbachi*		VU		+						+			
165	*Hyperolius thomensis*		EN									+		
166	*Hyperolius torrentis*		EN					+						+
167	*Hyperolius viridigulosus*		VU			+		+						
168	*Kassina arboricola*		VU			+		+						
169	*Kassina lamottei*		VU			+								
170	*Leptodactylodon axillaris*		CR		+									
171	*Leptodactylodon bicolor*		VU		+						+			
172	*Leptodactylodon boulengeri*		VU		+									

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
173	*Leptodactylodon bueanus*		VU		+									
174	*Leptodactylodon erythrogaster*		CR		+									
175	*Leptodactylodon mertensi*		EN		+									
176	*Leptodactylodon ornatus*		EN		+									
177	*Leptodactylodon perreti*		EN		+									
178	*Leptodactylodon polyacanthus*		VU		+						+			
179	*Leptodactylodon wildi*		EN		+									
180	*Leptopelis palmatus*		VU									+		
181	*Morerella cyanophthalma*		VU			+								
182	*Nimbaphrynoides liberiensis*		CR							+				
183	*Nimbaphrynoides occidentalis*		CR			+			+					
184	*Petropedetes perreti*		EN		+									
185	*Phrynobatrachus annulatus*		EN			+		+	+	+				
186	*Phrynobatrachus chukuchuku*		CR		+									
187	*Phrynobatrachus cricogaster*		VU		+						+			
188	*Phrynobatrachus ghanensis*		EN			+		+						
189	*Phrynobatrachus intermedius*		CR					+						
190	*Phrynobatrachus steindachneri*		VU		+						+			
191	*Phrynobatrachus villiersi*		VU			+		+						
192	*Ptychadena newtoni*		EN									+		
193	*Werneria bambutensis*		EN		+									
194	*Werneria mertensiana*		EN		+									
195	*Werneria preussi*		EN		+									
196	*Werneria submontana*		EN		+									
197	*Werneria tandyi*		EN		+									
198	*Wolterstorffina chirioi*		CR		+									

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199	*Wolterstorffina mirei*		EN		+									
200	*Wolterstorffina parvipalmata*		VU		+						+			
201	*Xenopus longipes*		CR		+									
	BONY FISHES		**172**	**10**	**72**	**24**	**11**	**21**	**39**	**31**	**31**	**6**	**27**	**7**
202	*Alestopetersius smykalai*		VU								+			
203	*Amphilius kakrimensis*		VU						+					
204	*Amphilius korupi*		EN		+									
205	*Aphyosemion amoenum*		EN		+									
206	*Aphyosemion bamilekorum*		EN		+									
207	*Aphyosemion bivittatum*		VU		+						+			
208	*Aphyosemion bualanum*		EN		+						+			
209	*Aphyosemion dargei*		VU		+									
210	*Aphyosemion edeanum*		VU		+									
211	*Aphyosemion franzwerneri*		EN		+									
212	*Aphyosemion poliaki*		EN		+									
213	*Aphyosemion viride*		VU						+	+				
214	*Aphyosemion volcanum*		EN		+									
215	*Aplocheilichthys keilhacki*		VU											+
216	*Archiaphyosemion jeanpoli*		EN						+	+				
217	*Arnoldichthys spilopterus*		VU								+			
218	*Awaous bustamantei*		VU				+					+		
219	*Balistes vetula*		VU				+		+				+	
220	*Barboides gracilis*		VU	+	+						+			
221	*Barbus aliciae*		EN						+	+				
222	*Barbus anniae*		VU						+					

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223	*Barbus bagbwensis*		VU										+	
224	*Barbus boboi*		CR							+				
225	*Barbus bourdariei*		EN		+									
226	*Barbus cadenati*		VU						+					
227	*Barbus carcharhinoides*		CR							+				
228	*Barbus dialonensis*		VU						+					
229	*Barbus ditinensis*		VU						+					
230	*Barbus eburneensis*		VU			+			+	+				
231	*Barbus foutensis*		VU						+				+	
232	*Barbus gruveli*		VU						+					
233	*Barbus huguenyi*		EN						+	+				
234	*Barbus kissiensis*		VU						+					
235	*Barbus lauzannei*		EN						+	+				
236	*Barbus liberiensis*		EN							+			+	
237	*Barbus melanotaenia*		CR							+				
238	*Barbus niokoloensis*		VU						+					
239	*Barbus petitjeani*		VU						+					
240	*Barbus raimbaulti*		VU						+					
241	*Barbus salessei*		VU						+				+	
242	*Barbus subinensis*		EN					+						
243	*Barbus sylvaticus*		EN	+							+			
244	*Barbus thysi*		EN		+		+							
245	*Barbus traorei*		EN			+								
246	*Barbus walkeri*		VU			+		+						
247	*Barbus zalbiensis*		VU		+									
248	*Benitochromis batesii*		VU		+		+							

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249	*Benitochromis conjunctus*		EN		+									
250	*Benitochromis finleyi*		EN		+									
251	*Benitochromis nigrodorsalis*		EN		+									
252	*Benitochromis ufermanni*		EN		+									
253	*Brycinus brevis*		VU					+			+			
254	*Brycinus carolinae*		VU						+					
255	*Brycinus derhami*		VU			+								
256	*Callopanchax monroviae*		VU							+				
257	*Chiloglanis benuensis*		VU		+						+			
258	*Chiloglanis disneyi*		VU		+									
259	*Chiloglanis polyodon*		CR										+	
260	*Chromidotilapia cavalliensis*		VU			+								
261	*Chromidotilapia linkei*		EN		+									
262	*Chrysichthys aluuensis*		VU		+						+			
263	*Chrysichthys longidorsalis*		VU		+									
264	*Chrysichthys teugelsi*		EN			+				+				
265	*Chrysichthys walkeri*		EN					+						
266	*Clarias maclareni*		CR		+									
267	*Ctenopoma nebulosum*		VU								+			
268	*Denticeps clupeoides*		VU	+	+						+			
269	*Doumea chappuisi*		VU			+			+	+				
270	*Doumea thysi*		VU		+						+			
271	*Epinephelus itajara*		CR	+	+	+	+	+	+	+	+		+	+
272	*Epinephelus marginatus*		EN	+	+	+	+	+	+	+	+		+	+
273	*Epiplatys biafranus*		EN								+			
274	*Epiplatys coccinatus*		CR							+				

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275	*Epiplatys etzeli*		EN			+								
276	*Epiplatys guineensis*		VU						+					
277	*Epiplatys hildegardae*		VU						+					
278	*Epiplatys lamottei*		VU						+	+				
279	*Epiplatys lokoensis*		EN										+	
280	*Epiplatys longiventralis*		VU								+			
281	*Epiplatys njalaensis*		EN										+	
282	*Epiplatys roloffi*		EN						+	+				
283	*Epiplatys ruhkopfi*		CR							+				
284	*Fundulopanchax amieti*		EN		+									
285	*Fundulopanchax arnoldi*		EN								+			
286	*Fundulopanchax cinnamomeus*		EN		+									
287	*Fundulopanchax fallax*		EN		+									
288	*Fundulopanchax marmoratus*		EN		+									
289	*Fundulopanchax oeseri*		EN				+							
290	*Fundulopanchax rubrolabialis*		EN		+									
291	*Fundulopanchax scheeli*		EN								+			
292	*Garra allostoma*		VU		+									
293	*Gobiocichla ethelwynnae*		EN		+									
294	*Hippocampus algiricus*		VU	+		+		+	+	+	+	+	+	
295	*Irvineia voltae*		EN					+						
296	*Kajikia albida*		VU	+	+	+	+	+	+	+	+	+	+	+
297	*Konia dikume*		CR		+									
298	*Konia eisentrauti*		CR		+									
299	*Kribia leonensis*		EN										+	
300	*Labeo alluaudi*		EN			+				+				

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301	*Labeo curriei*		CR							+				
302	*Labeobarbus mbami*		EN		+									
303	*Labeobarbus mungoensis*		EN		+									
304	*Ladigesia roloffi*		EN										+	
305	*Lepidarchus adonis*		VU			+		+						
306	*Leptocypris crossensis*		VU		+									
307	*Leptocypris konkourensis*		VU						+					
308	*Leptocypris taiaensis*		VU										+	
309	*Liauchenoglanis maculatus*		EN										+	
310	*Limbochromis robertsi*		EN					+						
311	*Makaira nigricans*		VU		+	+	+	+	+		+	+	+	
312	*Malapterurus murrayi*		EN					+						
313	*Marcusenius brucii*		VU								+			+
314	*Marcusenius meronai*		EN										+	
315	*Marcusenius sanagaensis*		VU		+									
316	*Mastacembelus taiaensis*		VU						+				+	
317	*Megalops atlanticus*		VU	+	+	+	+	+	+	+	+	+	+	+
318	*Micralestes comoensis*		VU			+								
319	*Micropanchax bracheti*		VU											+
320	*Mormyrus subundulatus*		EN			+		+						
321	*Myaka myaka*		CR		+									
322	*Nannocharax latifasciatus*		VU		+						+			
323	*Nannocharax rubrolabiatus*		VU		+									
324	*Neolebias axelrodi*		EN	+							+			
325	*Neolebias powelli*		CR								+			
326	*Nimbapanchax petersi*		VU			+		+						

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327	*Notoglanidium thomasi*		EN										+	
328	*Notoglanidium walkeri*		VU			+		+						
329	*Pagrus pagrus*		EN									+		
330	*Paramphilius firestonei*		EN							+				
331	*Paramphilius teugelsi*		VU						+				+	
332	*Parauchenoglanis akiri*		EN								+			
333	*Procatopus nimbaensis*		VU						+	+				
334	*Pungu maclareni*		CR		+									
335	*Rhexipanchax kabae*		VU						+					
336	*Rhexipanchax lamberti*		VU						+					
337	*Sarotherodon caroli*		CR		+									
338	*Sarotherodon linnellii*		CR		+									
339	*Sarotherodon lohbergeri*		CR		+									
340	*Sarotherodon steinbachi*		CR		+									
341	*Scriptaphyosemion bertholdi*		EN										+	
342	*Scriptaphyosemion brueningi*		EN							+			+	
343	*Scriptaphyosemion cauveti*		CR						+					
344	*Scriptaphyosemion etzeli*		CR										+	
345	*Scriptaphyosemion schmitti*		VU							+				
346	*Stomatepia mariae*		CR		+									
347	*Stomatepia mongo*		CR		+									
348	*Stomatepia pindu*		CR		+									
349	*Synodontis guttatus*		EN								+			
350	*Synodontis macrophthalmus*		VU	+				+						
351	*Synodontis robbianus*		VU								+			
352	*Tetraodon pustulatus*		VU		+						+			

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353	*Thunnus obesus*		VU			+	+	+	+	+	+		+	
354	*Tilapia bakossiorum*		CR		+									
355	*Tilapia bemini*		CR		+									
356	*Tilapia busumana*		VU			+		+						
357	*Tilapia bythobates*		CR		+									
358	*Tilapia camerunensis*		VU		+									
359	*Tilapia cessiana*		CR			+								
360	*Tilapia coffea*		CR							+				
361	*Tilapia deckerti*		CR		+									
362	*Tilapia discolor*		VU			+		+						
363	*Tilapia flava*		CR		+									
364	*Tilapia gutturosa*		CR		+									
365	*Tilapia imbriferna*		CR		+									
366	*Tilapia joka*		VU							+			+	
367	*Tilapia kottae*		EN		+									
368	*Tilapia snyderae*		CR		+									
369	*Tilapia* sp. nov. 'jewel'		VU		+									
370	*Tilapia* sp. nov. 'little black'		VU		+									
371	*Tilapia* sp. nov. 'yellow-green'		VU		+									
372	*Tilapia spongotroktis*		CR		+									
373	*Tilapia thysi*		CR		+									
	SHARKS AND RAYS		**33**	**16**	**20**	**20**	**13**	**20**	**24**	**21**	**24**	**7**	**21**	**15**
374	*Alopias superciliosus*		VU						+				+	
375	*Alopias vulpinus*		VU		+	+		+	+	+	+		+	
376	*Carcharhinus longimanus*		VU	+	+	+	+	+	+	+		+	+	+

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377	*Carcharhinus obscurus*		VU										+	
378	*Carcharhinus plumbeus*		VU	+	+	+	+	+	+	+	+	+		+
379	*Carcharhinus signatus*		VU	+	+	+		+	+	+	+		+	+
380	*Carcharias taurus*		VU		+			+	+	+	+		+	
381	*Centrophorus granulosus*		VU		+	+				+	+			
382	*Centrophorus lusitanicus*		VU		+	+		+	+		+			
383	*Dasyatis garouaensis*		VU	+	+				+		+			
384	*Dasyatis margarita*		EN	+	+	+		+	+	+	+		+	+
385	*Galeorhinus galeus*		VU			+					+			
386	*Glaucostegus cemiculus*		EN		+	+		+	+	+	+		+	+
387	*Gymnura altavela*		VU	+	+	+	+	+		+	+		+	+
388	*Isurus oxyrinchus*		VU	+	+	+	+	+	+	+	+		+	
389	*Isurus paucus*		VU					+		+				
390	*Manta birostris*		VU								+			
391	*Mobula rochebrunei*		VU						+					
392	*Mustelus mustelus*		VU	+	+	+	+	+	+	+	+	+	+	+
393	*Oxynotus centrina*		VU						+	+	+			
394	*Pristis pectinata*		CR										+	
395	*Pristis pristis*		CR										+	
396	*Raja undulata*		EN	+	+	+	+	+	+	+			+	+
397	*Rhincodon typus*		VU	+	+	+	+	+	+	+	+	+	+	+
398	*Rhinobatos albomaculatus*		VU	+		+	+	+	+	+	+		+	+
399	*Rhinobatos irvinei*		VU	+	+	+	+	+	+	+	+		+	+
400	*Rhinobatos rhinobatos*		EN	+	+	+	+	+	+	+	+		+	+
401	*Rhynchobatus luebberti*		EN	+	+	+	+	+	+	+	+		+	+
402	*Rostroraja alba*		EN	+	+	+	+	+	+	+	+	+	+	+

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403	*Sphyrna lewini*		EN	+	+	+	+	+	+	+	+	+	+	+
404	*Squatina aculeata*		CR						+					
405	*Squatina oculata*		CR						+		+	+		
406	*Urogymnus ukpam*		EN								+			
	BUTTERFLIES		**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
407	*Liptena tiassale*		VU					+						
408	*Mylothris atewa*		VU					+						
	ODONATES		**16**	**1**	**10**	**0**	**2**	**0**	**0**	**2**	**7**	**1**	**3**	**0**
409	*Africocypha lacuselephantum*		VU		+		+							
410	*Agriocnemis angustirami*		VU							+			+	
411	*Ceriagrion citrinum*		VU	+							+			
412	*Chlorocnemis sp. nov. A*		EN		+						+			
413	*Chlorocypha centripunctata*		VU		+						+			
414	*Elattoneura dorsalis*		VU										+	
415	*Mesocnemis tisi*		EN							+				
416	*Neodythemis takamandensis*		CR		+									
417	*Nesolestes nigeriensis*		CR		+						+			
418	*Nubiolestes diotima*		VU		+						+			
419	*Pentaphlebia stahli*		VU		+						+			
420	*Pseudagrion mascagnii*		CR										+	
421	*Sapho puella*		EN		+						+			
422	*Trithemis nigra*		CR									+		
423	*Umma mesumbei*		EN		+									
424	*Umma purpurea*		VU		+		+							

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	CRABS AND SHRIMPS		**16**	**0**	**4**	**0**	**1**	**1**	**3**	**6**	**5**	**1**	**0**	**0**
425	*Atya intermedia*		EN				+					+		
426	*Caridina sodenensis*		VU		+									
427	*Desmocaris bislineata*		EN								+			
428	*Euryrhynchina edingtonae*		EN								+			
429	*Globonautes macropus*		EN						+	+				
430	*Liberonautes grandbassa*		CR							+				
431	*Liberonautes lugbe*		CR							+				
432	*Liberonautes nanoides*		EN							+				
433	*Liberonautes nimba*		VU						+	+				
434	*Liberonautes rubigimanus*		EN						+	+				
435	*Louisea balssi*		EN		+									
436	*Louisea edeaensis*		EN		+									
437	*Potamalpheops haugi*		EN								+			
438	*Potamonautes reidi*		VU								+			
439	*Potamonautes triangulus*		VU					+						
440	*Potamonemus sachsi*		VU		+						+			
	MOLLUSKS		**13**	**0**	**6**	**2**	**0**	**0**	**0**	**1**	**0**	**1**	**3**	**0**
441	*Archachatina bicarinata*		VU									+		
442	*Bellamya liberiana*		CR							+				
443	*Bulinus camerunensis*		EN		+									
444	*Coelatura lobensis*		VU		+									
445	*Hydrobia guyenoti*		EN			+								
446	*Potadoma angulata*		EN		+									

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447	*Potadoma nyongensis*		EN		+									
448	*Potadoma trochiformis*		EN		+									
449	*Potadoma vogeli*		VU			+								
450	*Potadoma zenkeri*		EN		+									
451	*Sierraia expansilabrum*		VU										+	
452	*Sierraia leonensis*		VU										+	
453	*Sierraia outambensis*		CR										+	
	PLANTS		**483**	**14**	**341**	**104**	**54**	**113**	**25**	**48**	**164**	**36**	**52**	**10**
454	*Acanthopale decempedalis*		VU		+		+				+			
455	*Achyranthes talbotii*		VU		+						+			
456	*Acioa dichotoma*		CR								+			
457	*Acioa eketensis*		CR								+			
458	*Afrocarpus mannii*		VU									+		
459	*Afrofittonia silvestris*		VU		+		+				+			
460	*Afrostyrax lepidophyllus*		VU		+			+						
461	*Afrothismia pachyantha*		CR		+									
462	*Afrothismia winkleri*		CR		+									
463	*Afzelia africana*		VU	+	+	+		+	+		+		+	+
464	*Afzelia bipindensis*		VU		+						+			
465	*Afzelia pachyloba*		VU		+						+			
466	*Albizia ferruginea*		VU	+	+	+		+	+		+		+	+
467	*Allanblackia gabonensis*		VU		+									
468	*Allexis cauliflora*		VU					+			+			
469	*Allexis obanensis*		VU		+						+			
470	*Allophylus bullatus*		VU		+						+	+		

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
471	*Amanoa bracteosa*		VU			+		+		+			+	
472	*Amanoa strobilacea*		VU		+			+		+				
473	*Amorphophallus preussii*		VU		+									
474	*Amphiblemma amoenum*		EN		+									
475	*Aneilema silvaticum*		VU		+						+			
476	*Angraecopsis cryptantha*		VU		+									
477	*Angraecopsis tridens*		VU		+		+							
478	*Angraecum pyriforme*		VU		+	+					+			
479	*Angraecum sanfordii*		EN		+									
480	*Angylocalyx talbotii*		VU		+						+			
481	*Anisophyllea cabole*		VU									+		
482	*Anopyxis klaineana*		VU		+	+		+		+	+		+	
483	*Ansellia africana*		VU	+	+	+	+	+	+		+		+	+
484	*Anthocleista microphylla*		VU		+		+	+			+	+		
485	*Anthocleista scandens*		VU		+		+				+	+		
486	*Anthonotha nigerica*		VU								+			
487	*Anthonotha obanensis*		VU								+			
488	*Anthonotha vignei*		VU			+		+		+			+	
489	*Antrocaryon micraster*		VU		+	+		+			+		+	
490	*Ardisia koupensis*		EN		+									
491	*Asystasia glandulifera*		VU		+									
492	*Asystasia lindauiana*		VU		+									
493	*Aubregrinia taiensis*		CR			+		+						
494	*Autranella congolensis*		CR		+						+			
495	*Bafodeya benna*		VU						+				+	
496	*Baillonella toxisperma*		VU		+						+			

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497	*Balthasaria mannii*		VU									+		
498	*Baphia dewildeana*		VU		+						+			
499	*Baphia latiloi*		VU		+						+			
500	*Baphia obanensis*		VU		+						+			
501	*Begonia adpressa*		VU		+									
502	*Begonia bonus-henricus*		VU		+									
503	*Begonia duncan-thomasii*		VU		+									
504	*Begonia furfuracea*		VU		+		+							
505	*Begonia oxyanthera*		VU		+		+							
506	*Begonia pelargoniiflora*		CR		+		+							
507	*Begonia preussii*		VU		+		+				+			
508	*Begonia pseudoviola*		VU		+						+			
509	*Begonia schaeferi*		VU		+						+			
510	*Belonophora ongensis*		CR		+						+			
511	*Berlinia hollandii*		EN								+			
512	*Berlinia occidentalis*		VU			+		+		+			+	
513	*Bidens mannii*		VU		+									
514	*Boutiquea platypetala*		EN		+									
515	*Brachystegia kennedyi*		VU		+						+			
516	*Brachystegia nigerica*		VU		+						+			
517	*Brachystephanus giganteus*		VU		+		+							
518	*Brachystephanus kupeensis*		CR		+									
519	*Brachystephanus longiflorus*		VU		+		+				+			
520	*Brachystephanus nimbae*		VU		+	+		+	+	+				
521	*Brillantaisia lancifolia*		VU								+			
522	*Bulbophyllum bifarium*		VU		+									

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523	*Bulbophyllum filiforme*		CR		+						+			
524	*Bulbophyllum gravidum*		VU		+		+							
525	*Bulbophyllum jaapii*		VU		+									
526	*Bulbophyllum kupense*		CR		+									
527	*Bulbophyllum nigericum*		VU		+						+			
528	*Bulbophyllum pandanetorum*		EN		+									
529	*Calochone acuminata*		VU		+									
530	*Calpocalyx cauliflorus*		VU		+						+			
531	*Calpocalyx klainei*		VU		+									
532	*Calpocalyx ngouiensis*		VU		+									
533	*Calycosiphonia macrochlamys*		VU		+		+	+						
534	*Campylospermum letouzeyi*		VU		+									
535	*Casearia mannii*		VU									+		
536	*Cassia aubrevillei*		VU			+								
537	*Cassia fikifiki*		EN			+								
538	*Cassipourea acuminata*		EN		+									
539	*Cassipourea eketensis*		CR								+			
540	*Cassipourea hiotou*		VU			+		+						
541	*Chassalia laikomensis*		CR		+						+			
542	*Chassalia petitiana*		VU				+							
543	*Chazaliella obanensis*		VU		+						+			
544	*Chlorophytum petrophilum*		CR		+									
545	*Chrysophyllum azaguieanum*		EN			+		+						
546	*Citropsis gabunensis*		VU					+						
547	*Cleistopholis staudtii*		VU		+						+			
548	*Clerodendrum anomalum*		VU		+									

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549	*Coffea bakossii*		EN		+									
550	*Coffea togoensis*		VU					+						+
551	*Cola attiensis*		EN			+								
552	*Cola boxiana*		EN					+						
553	*Cola cecidiifolia*		CR		+									
554	*Cola gigas*		VU								+			
555	*Cola glabra*		VU								+			
556	*Cola hypochrysea*		VU		+						+			
557	*Cola lourougnonis*		EN		+	+								
558	*Cola metallica*		CR		+									
559	*Cola nigerica*		CR								+			
560	*Cola philipi-jonesii*		EN								+			
561	*Cola praeacuta*		CR		+									
562	*Cola reticulata*		VU			+		+	+					
563	*Cola suboppositifolia*		VU		+									
564	*Cola umbratilis*		VU			+		+						
565	*Copaifera salikounda*		VU			+		+	+	+			+	
566	*Cordia platythyrsa*		VU		+	+		+		+	+		+	
567	*Craibia atlantica*		VU		+	+		+			+			
568	*Crassocephalum bauchiense*		VU		+		+				+			
569	*Crateranthus talbotii*		VU		+						+			
570	*Craterispermum montanum*		VU									+		
571	*Crotalaria bamendae*		VU		+						+			
572	*Crotalaria ledermannii*		VU		+						+			
573	*Croton aubrevillei*		VU		+	+		+						
574	*Croton stellulifer*		VU									+		

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575	*Crotonogyne impedita*		CR		+									
576	*Crotonogyne strigosa*		VU		+						+			
577	*Crotonogyne zenkeri*		VU		+									
578	*Cryptosepalum diphyllum*		EN								+			
579	*Cryptosepalum tetraphyllum*		VU			+		+	+	+			+	
580	*Culcasia sanagensis*		VU		+									
581	*Cussonia bancoensis*		VU					+						
582	*Cuviera talbotii*		VU		+						+			
583	*Cyathula fernando-poensis*		VU		+		+							
584	*Cylicomorpha solmsii*		VU		+									
585	*Cyperus microcristatus*		CR		+									
586	*Cyperus rheophytorum*		VU		+									
587	*Dactyladenia dinklagei*		VU			+		+		+				
588	*Dactyladenia hirsuta*		EN			+		+						
589	*Dactyladenia johnstonei*		CR		+									
590	*Dactyladenia mannii*		CR		+		+							
591	*Dalbergia oligophylla*		EN		+									
592	*Dalbergia setifera*		EN					+						
593	*Daniellia oblonga*		VU	+	+		+				+			
594	*Deinbollia insignis*		VU		+									
595	*Deinbollia maxima*		VU		+						+		+	
596	*Deinbollia molliuscula*		VU					+						
597	*Deinbollia saligna*		VU		+			+			+			
598	*Desmostachys vogelii*		VU		+			+			+			
599	*Diaphananthe bueae*		EN		+									
600	*Diaphananthe polydactyla*		VU		+									

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601	*Dichapetalum bocageanum*		VU									+		
602	*Dicliptera silvestris*		VU		+									
603	*Dicraeanthus zehnderi*		CR		+									
604	*Dicranolepis polygaloides*		VU		+									
605	*Dielsantha galeopsoides*		EN		+		+				+			
606	*Dinklageella scandens*		VU									+		
607	*Diospyros barteri*		VU		+			+			+			
608	*Diospyros crassiflora*		EN		+						+			
609	*Diospyros kupensis*		VU		+									
610	*Dipsacus narcisseanus*		VU		+							+		
611	*Disperis mildbraedii*		VU		+		+				+			
612	*Disperis nitida*		EN		+									
613	*Dombeya ledermannii*		CR		+						+			
614	*Dorstenia astyanactis*		EN		+	+								
615	*Dorstenia prorepens*		VU		+		+				+			
616	*Dracaena viridiflora*		VU		+						+			
617	*Drypetes afzelii*		VU			+		+		+			+	
618	*Drypetes glabra*		VU									+		
619	*Drypetes henriquesii*		VU									+		
620	*Drypetes magnistipula*		EN		+									
621	*Drypetes molundana*		VU		+						+			
622	*Drypetes obanensis*		VU								+			
623	*Drypetes pellegrinii*		VU			+		+						
624	*Drypetes preussii*		VU		+						+			
625	*Drypetes singroboensis*		VU			+		+						
626	*Drypetes staudtii*		VU		+						+			

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627	*Duguetia barteri*		VU		+						+			
628	*Ehretia scrobiculata*		VU									+		
629	*Entandrophragma angolense*		VU		+	+	+	+	+	+	+		+	
630	*Entandrophragma candollei*		VU		+	+		+	+	+	+			
631	*Entandrophragma cylindricum*		VU		+	+		+			+		+	+
632	*Entandrophragma utile*		VU		+	+		+		+	+		+	
633	*Eribroma oblonga*		VU		+	+	+	+		+	+		+	
634	*Eriocaulon asteroides*		VU		+						+			
635	*Eriocaulon bamendae*		VU		+						+			
636	*Eriocaulon parvulum*		VU		+									
637	*Eriocaulon stipantepalum*		EN		+									
638	*Erythrococca columnaris*		VU									+		
639	*Eugenia fernandopoana*		VU		+		+							
640	*Eugenia gilgii*		CR		+						+			
641	*Eugenia tabouensis*		VU			+								
642	*Eurypetalum unijugum*		VU		+									
643	*Fagara mezoneurospinosa*		EN			+								
644	*Fleurydora felicis*		VU						+					
645	*Floscopa mannii*		EN		+						+			
646	*Garcinia afzelii*		VU			+		+						
647	*Garcinia brevipedicellata*		VU		+						+			
648	*Garcinia epunctata*		VU					+						
649	*Garcinia kola*		VU	+	+	+		+		+			+	
650	*Garcinia staudtii*		VU		+						+			
651	*Genyorchis macrantha*		VU		+									
652	*Genyorchis micropetala*		EN		+		+							

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653	*Genyorchis platybulbon*		CR		+									
654	*Gilbertiodendron bilineatum*		VU			+		+		+			+	
655	*Gilbertiodendron robynsianum*		VU			+								
656	*Gilbertiodendron splendidum*		VU			+		+					+	
657	*Gluema ivorensis*		VU		+	+		+						
658	*Gossweilerodendron balsamiferum*		EN		+						+			
659	*Gossweilerodendron joveri*		VU		+									
660	*Grossera elongata*		VU									+		
661	*Guarea cedrata*		VU		+	+		+		+	+		+	
662	*Guarea thompsonii*		VU		+	+		+		+	+			
663	*Gymnostemon zaizou*		VU			+								
664	*Habenaria batesii*		EN		+									
665	*Habenaria nigrescens*		VU		+						+			
666	*Habenaria obovata*		VU		+									
667	*Habenaria thomana*		VU		+		+					+		
668	*Hallea ledermannii*		VU	+	+	+	+	+		+	+			
669	*Hallea stipulosa*		VU		+			+	+		+		+	
670	*Hamilcoa zenkeri*		VU		+									
671	*Haplormosia monophylla*		VU		+	+				+	+		+	
672	*Helichrysum biafranum*		VU		+									
673	*Hemandradenia chevalieri*		EN			+		+						
674	*Heritiera utilis*		VU			+		+		+			+	
675	*Hexalobus salicifolius*		EN		+	+								
676	*Homalium dalzielii*		VU	+							+			
677	*Homalium hypolasium*		EN		+									
678	*Homalium patoklaense*		VU			+								

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679	*Homalium smythei*		VU			+			+	+			+	
680	*Hugonia macrophylla*		VU		+									
681	*Hugonia micans*		VU		+									
682	*Hunteria ghanensis*		EN					+						
683	*Hymenocoleus glaber*		VU		+									
684	*Hymenostegia bakeriana*		VU		+						+			
685	*Hymenostegia gracilipes*		EN					+						
686	*Hymenostegia talbotii*		CR								+			
687	*Hypolytrum pseudomapanioides*		EN		+									
688	*Hypolytrum subcompositus*		CR		+									
689	*Hypseochloa cameroonensis*		VU		+									
690	*Impatiens etindensis*		VU		+									
691	*Impatiens frithii*		EN		+									
692	*Impatiens letouzeyi*		EN		+									
693	*Impatiens sakeriana*		VU		+		+							
694	*Isoglossa nervosa*		VU		+									
695	*Isolona deightonii*		VU					+					+	
696	*Isolona zenkeri*		VU		+									
697	*Ixora degemensis*		EN								+			
698	*Ixora foliosa*		VU		+						+			
699	*Ixora nigerica*		VU								+			
700	*Jollydora glandulosa*		VU		+						+			
701	*Justicia camerunensis*		VU		+						+			
702	*Justicia leucoxiphos*		EN		+									
703	*Justicia orbicularis*		VU		+						+			
704	*Keetia bakossii*		CR		+									

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705	*Khaya anthotheca*		VU		+	+		+		+	+		+	
706	*Khaya grandifoliola*		VU	+		+		+	+		+			+
707	*Khaya ivorensis*		VU		+	+		+		+	+			
708	*Khaya senegalensis*		VU	+	+	+		+	+		+		+	+
709	*Kniphofia reflexa*		EN		+									
710	*Korupodendron songweanum*		EN		+									
711	*Kupea martinetugei*		CR		+									
712	*Lasiodiscus rozeirae*		VU									+		
713	*Lecaniodiscus punctatus*		EN		+			+						
714	*Ledermanniella aloides*		VU		+					+			+	
715	*Ledermanniella annithomae*		EN		+									
716	*Ledermanniella batangensis*		CR		+									
717	*Ledermanniella bifurcata*		VU		+									
718	*Ledermanniella boumiensis*		VU		+									
719	*Ledermanniella cristata*		VU		+									
720	*Ledermanniella kamerunensis*		VU		+									
721	*Ledermanniella keayi*		CR		+									
722	*Ledermanniella letouzeyi*		EN		+									
723	*Ledermanniella linearifolia*		EN		+									
724	*Ledermanniella onanae*		EN		+									
725	*Ledermanniella schlechteri*		VU		+									
726	*Ledermanniella thalloidea*		EN		+									
727	*Ledermanniella variabilis*		EN		+									
728	*Lefebvrea camerunensis*		EN		+									
729	*Lefebvrea kupense*		VU		+									
730	*Leiothylax quangensis*		EN		+									

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731	*Limnophyton fluitans*		VU		+						+			
732	*Liparis goodyeroides*		CR		+						+			
733	*Loesenera kalantha*		VU			+				+				
734	*Loesenera talbotii*		VU		+						+			
735	*Lophira alata*		VU		+	+	+	+		+	+		+	
736	*Lovoa trichilioides*		VU		+	+		+		+	+		+	
737	*Luzula mannii*		VU		+		+							
738	*Macaranga beillei*		VU			+								
739	*Macaranga paxii*		VU		+						+			
740	*Macropodiella heteromorpha*		VU		+	+								
741	*Macropodiella pellucida*		EN		+									
742	*Magnistipula conrauana*		EN		+									
743	*Magnistipula cuneatifolia*		CR		+									
744	*Manniella cypripedioides*		EN		+		+							
745	*Mapania ferruginea*		VU		+							+		
746	*Marantochloa mildbraedii*		EN		+									
747	*Marsdenia exellii*		EN						+			+		
748	*Medusandra richardsiana*		VU		+									
749	*Memecylon candidum*		VU		+						+			
750	*Memecylon dasyanthum*		VU		+									
751	*Microberlinia bisulcata*		CR		+									
752	*Mikaniopsis maitlandii*		VU		+		+				+			
753	*Mikaniopsis vitalba*		VU		+									
754	*Milicia regia*		VU	+	+	+		+	+	+				
755	*Millettia conraui*		VU		+						+			
756	*Millettia macrophylla*		VU		+		+				+			

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757	*Millettia warneckei*		VU					+	+	+			+	+
758	*Mitrostigma barteri*		EN		+									
759	*Momordica enneaphylla*		VU		+									
760	*Monocyclanthus vignei*		EN					+		+				
761	*Monodora unwinii*		VU								+			
762	*Monopetalanthus compactus*		VU			+				+			+	
763	*Monopetalanthus hedinii*		CR		+									
764	*Morella arborea*		VU				+							
765	*Napoleonaea egertonii*		VU		+						+			
766	*Napoleonaea lutea*		CR								+			
767	*Napoleonaea reptans*		CR								+			
768	*Nauclea diderrichii*		VU		+	+		+		+	+		+	
769	*Neolemonniera clitandrifolia*		EN					+		+	+		+	
770	*Neoschumannia kamerunensis*		CR		+	+								
771	*Neostenanthera hamata*		VU			+		+		+			+	
772	*Nesogordonia papaverifera*		VU	+	+	+		+		+	+		+	
773	*Nodonema lineatum*		VU		+						+			
774	*Nothospondias staudtii*		VU		+	+		+			+			
775	*Oncoba lophocarpa*		VU		+									
776	*Ossiculum aurantiacum*		CR		+									
777	*Ouratea amplectens*		VU					+		+				
778	*Ouratea quintasii*		VU									+		
779	*Oxyanthus montanus*		VU		+		+							
780	*Oxyanthus okuensis*		CR		+									
781	*Palisota preussiana*		VU		+		+							
782	*Pandanus thomensis*		VU									+		

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
783	*Pararistolochia ceropegioides*		VU		+									
784	*Pararistolochia goldieana*		VU		+		+				+		+	
785	*Pararistolochia preussii*		CR		+									
786	*Pauridiantha divaricata*		VU		+									
787	*Pauridiantha insularis*		VU									+		
788	*Pauridiantha venusta*		VU		+									
789	*Pavetta brachycalyx*		EN		+									
790	*Pavetta kupensis*		CR		+									
791	*Pavetta lasioclada*		VU		+	+		+	+				+	+
792	*Pavetta mollissima*		VU					+						
793	*Pavetta monticola*		VU				+					+		
794	*Pavetta muiriana*		EN		+									
795	*Pavetta rubentifolia*		CR		+									
796	*Pentas ledermannii*		VU		+						+			
797	*Peperomia kamerunana*		EN		+		+							
798	*Pericopsis elata*		EN		+	+		+			+			
799	*Phyllanthus caesiifolius*		CR		+									
800	*Phyllanthus nyale*		CR		+									
801	*Phyllanthus profusus*		VU					+	+	+				
802	*Pierreodendron kerstingii*		VU	+		+		+						+
803	*Piptostigma calophyllum*		VU		+									
804	*Piptostigma fugax*		VU			+		+		+				
805	*Piptostigma giganteum*		VU								+			
806	*Placodiscus attenuatus*		EN			+		+						
807	*Placodiscus bancoensis*		VU			+		+						
808	*Placodiscus boya*		VU			+		+						

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
809	*Placodiscus bracteosus*		VU			+		+						
810	*Placodiscus caudatus*		EN		+									
811	*Placodiscus oblongifolius*		VU					+						
812	*Placodiscus opacus*		VU		+									
813	*Placodiscus pseudostipularis*		EN			+		+		+			+	
814	*Plagiosiphon longitubus*		CR		+									
815	*Plectranthus cataractarum*		VU		+		+							
816	*Polyscias quintasii*		EN									+		
817	*Polystachya bicalcarata*		VU		+		+							
818	*Polystachya cooperi*		EN		+						+			
819	*Polystachya farinosa*		EN		+							+		
820	*Polystachya geniculata*		EN		+									
821	*Polystachya kupensis*		CR		+									
822	*Polystachya superposita*		EN				+							
823	*Polystachya victoriae*		CR		+									
824	*Premna grandifolia*		VU			+								
825	*Prunus africana*		VU		+		+					+		
826	*Pseudagrostistachys africana*		VU		+		+	+			+	+		
827	*Pseuderanthemum dispersum*		VU		+						+			
828	*Pseudosabicea batesii*		VU		+									
829	*Pseudosabicea medusula*		VU		+									
830	*Pseudosabicea pedicellata*		VU		+						+			
831	*Psychotria bimbiensis*		CR		+									
832	*Psychotria camerunensis*		VU		+									
833	*Psychotria densinervia*		EN		+									
834	*Psychotria guerkeana*		VU									+		

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
835	*Psychotria hierniana*		VU									+		
836	*Psychotria lanceifolia*		VU		+									
837	*Psychotria minimicalyx*		CR		+									
838	*Psychotria moliwensis*		CR		+									
839	*Psychotria moseskemei*		CR		+						+			
840	*Psychotria podocarpa*		VU		+						+			
841	*Psydrax bridsoniana*		EN		+									
842	*Pterygota bequaertii*		VU		+	+		+			+			
843	*Pterygota macrocarpa*		VU		+	+		+			+		+	
844	*Pyrenacantha cordicula*		EN		+	+	+	+						
845	*Quassia sanguinea*		VU		+						+			
846	*Raphia regalis*		VU		+						+			
847	*Raphionacme caerulea*		EN						+				+	
848	*Rhabdotosperma ledermannii*		VU		+						+			
849	*Rhaphidophora pusilla*		VU		+									
850	*Rhodognaphalon brevicuspe*		VU		+	+		+			+		+	
851	*Rhytachne furtiva*		VU					+						
852	*Rhytachne glabra*		VU						+				+	
853	*Rinorea fausteana*		EN		+									
854	*Rinorea thomasii*		VU		+									
855	*Rinorea thomensis*		VU									+		
856	*Robynsia glabrata*		VU			+		+			+			
857	*Rothmannia ebamutensis*		EN		+									
858	*Rutidea nigerica*		VU	+	+						+			
859	*Sabicea xanthotricha*		EN		+						+			
860	*Salacia fimbrisepala*		CR		+			+						

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
861	*Salacia mamba*		VU		+									
862	*Salacia miegei*		VU			+								
863	*Sapium aubrevillei*		VU			+		+						
864	*Sarcophrynium villosum*		EN		+									
865	*Saxicolella laciniata*		VU		+									
866	*Saxicolella marginalis*		CR		+						+			
867	*Scaphopetalum parvifolium*		VU								+			
868	*Schefflera hierniana*		VU		+		+							
869	*Schefflera mannii*		VU		+		+				+	+		
870	*Schumanniophyton problematicum*		VU			+		+					+	
871	*Scleria afroreflexa*		EN		+									
872	*Sclerochiton preussii*		EN		+						+			
873	*Secamone racemosa*		VU		+		+							
874	*Sericanthe toupetou*		EN			+		+						
875	*Silene biafrae*		VU		+									
876	*Soyauxia talbotii*		EN								+			
877	*Spathandra barteri*		VU					+						
878	*Staudtia pterocarpa*		VU									+		
879	*Staurogyne bicolor*		VU		+									
880	*Stelechantha arcuata*		CR		+									
881	*Strychnos elaeocarpa*		VU		+									
882	*Strychnos millepunctata*		VU			+								
883	*Strychnos staudtii*		VU		+									
884	*Stylochaeton pilosus*		EN						+				+	
885	*Synsepalum aubrevillei*		VU			+		+						
886	*Synsepalum glycydora*		VU								+			

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
887	*Synsepalum tsounkpe*		EN			+								
888	*Talbotiella eketensis*		EN								+			
889	*Talbotiella gentii*		CR					+						
890	*Tapinanthus letouzeyi*		VU		+									
891	*Tapinanthus preussii*		VU		+						+			
892	*Tapura ivorensis*		VU			+		+						
893	*Tarenna hutchinsonii*		CR						+	+				
894	*Teclea carpopunctifera*		VU			+								
895	*Terminalia ivorensis*		VU		+	+		+	+	+	+		+	
896	*Testulea gabonensis*		EN		+									
897	*Tetraberlinia tubmaniana*		VU							+				
898	*Thecacoris annobonae*		EN		+		+							
899	*Tieghemella africana*		EN		+								+	
900	*Tieghemella heckelii*		EN		+	+		+		+	+		+	
901	*Tiliacora lehmbachii*		EN		+									
902	*Tricalysia atherura*		VU		+									
903	*Tricalysia lejolyana*		EN		+									
904	*Tricalysia talbotii*		VU		+						+			
905	*Trichilia ornithothera*		VU			+		+						
906	*Trichoscypha cavalliensis*		VU			+		+		+				
907	*Trichoscypha mannii*		VU		+	+		+		+	+			
908	*Trichostachys interrupta*		VU		+						+			
909	*Triclisia lanceolata*		EN		+									
910	*Triclisia macrophylla*		CR		+		+						+	
911	*Turraea adjanohounii*		VU			+								
912	*Turraeanthus africanus*		VU	+	+	+	+	+			+		+	

No.	Scientific Name	Common Name	Global Threat Status	Benin	Cameroon	Côte d'Ivoire	Equatorial Guinea[1]	Ghana	Guinea	Liberia	Nigeria	Sao Tomé and Príncipe	Sierra Leone	Togo
913	*Tylophora urceolata*		VU		+		+							
914	*Uvariastrum zenkeri*		VU		+						+			
915	*Uvariodendron giganteum*		VU		+									
916	*Uvariodendron occidentale*		VU		+	+		+		+	+			
917	*Uvariopsis submontana*		EN		+									
918	*Uvariopsis tripetala*		VU					+			+			
919	*Uvariopsis vanderystii*		EN		+									
920	*Vepris heterophylla*		EN		+			+						
921	*Vepris lecomteana*		VU		+						+			
922	*Vepris trifoliolata*		VU		+									
923	*Vernonia bamendae*		VU		+						+			
924	*Vincentella densiflora*		VU									+		
925	*Vitex lehmbachii*		EN		+									
926	*Vitex yaundensis*		CR		+									
927	*Warneckea memecyloides*		VU		+	+		+			+			
928	*Whitfieldia preussii*		VU		+		+							
929	*Winklerella dichotoma*		CR		+									
930	*Xylopia africana*		VU		+						+	+		
931	*Xylopia elliotii*		VU					+						
932	*Xylopia talbotii*		VU								+			
933	*Zanthoxylum atchoum*		VU			+								
934	*Zanthoxylum chevalieri*		VU					+						
935	*Zanthoxylum psammophilum*		EN			+								
936	*Zehnderia microgyna*		CR		+									
	Total		**936**	**65**	**567**	**209**	**106**	**202**	**140**	**149**	**287**	**78**	**141**	**54**

Source: IUCN Red List version 2013.

Note: 1 - species listed for Equatorial Guinea only include those recorded on the islands of Annobón and Bioko.

Appendix 5: Site Outcomes for the Guinean Forests of West Africa Hotspot

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
	BENIN						
BEN1	Lake Nokoué	Terrestrial	none	98,403	0	3	
	CAMEROON						
CMR1	Bakossi Mountains	Terrestrial	Korupmba-Obachap	75,581	38	1	Yes
CMR2	Bali-Ngemba Forest Reserve	Terrestrial	Korupmba-Obachap	899	0	2	Yes
CMR3	Bamboutos Mountains	Terrestrial	Korupmba-Obachap	7,396	0	1	Yes
CMR4	Banyang Mbo Wildlife Sanctuary	Terrestrial	Korupmba-Obachap	69,145	100	4	
CMR5	Korup National Park	Terrestrial	Korupmba-Obachap	129,115	100	3	
CMR6	Mbi Crater Faunal Reserve - Mbingo forest	Terrestrial	Korupmba-Obachap	3,233	0	1	Yes
CMR7	Mont Bana	Terrestrial	Korupmba-Obachap	159	0	2	
CMR8	Mont Kupe Integral Ecological Reserve	Terrestrial	Korupmba-Obachap	428	0	1	
CMR9	Mont Manengouba	Terrestrial	Korupmba-Obachap	8,740	0	1	
CMR10	Mont Nganha	Terrestrial	none	16,930	0	1	
CMR11	Mont Nlonako	Terrestrial	Korupmba-Obachap	64,124	0	1	
CMR12	Mount Cameroon and Mokoko-Onge	Terrestrial	Korupmba-Obachap	107,143	54	1	Yes
CMR13	Mount Lefo	Terrestrial	Korupmba-Obachap	1,649	0	1	
CMR14	Mount Mbam	Terrestrial	Korupmba-Obachap	13,221	0	2	
CMR15	Mount Oku	Terrestrial	Korupmba-Obachap	16,353	0	1	Yes
CMR16	Mount Rata and Rumpi Hills Forest Reserve	Terrestrial	Korupmba-Obachap	45,200	0	1	Yes
CMR17	Santchou Faunal Reserve	Terrestrial	Korupmba-Obachap	9,506	100	4	
CMR18	Tchabal Mbabo	Terrestrial	Korupmba-Obachap	312,347	0	1	Yes
CMR19	Yabassi	Terrestrial	Korupmba-Obachap	264,867	0	2	Yes

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
	CÔTE D'IVOIRE						
CIV1	Adiopodoume	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	1,939	0	2	
CIV2	Forêt Classée de Bossematié	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	21,976	0	2	
CIV3	Forêt Classée de Cavally et Goin - Débé	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	197,925	0	2	Yes
CIV4	Forêt Classée de Mabi	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	62,095	0	4	
CIV5	Forêt Classée de Mopri	Terrestrial	Bandama River Catchment	32,459	0	3	
CIV6	Forêt Classée de Yapo et Mambo	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	30,598	0	2	
CIV7	Forêt Classée des Mont Guéoulé et Mont Glo Réserves	Terrestrial	Mount Nimba Complex	49,019	0	2	
CIV8	Mount Nimba (part of Mount Nimba transboundary AZE)	Terrestrial	Mount Nimba Complex	27,035	17	2	
CIV9	Parc National d' Azagny	Terrestrial	Bandama River Catchment	18,865	93	4	
CIV10	Parc National de Marahoué	Terrestrial	none	87,526	100	4	
CIV11	Parc National de Taï et Réserve de Faune du N'Zo	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	539,376	100	3	
CIV12	Parc National du Mont Péko	Terrestrial	none	29,330	0	4	
CIV13	Parc National du Mont Sangbé	Terrestrial	none	75,029	100	4	
CIV14	Réserve Intégrale du Mont Nimba	Terrestrial	Mount Nimba Complex	6,480	83	4	
CIV15	Station de recherche écologique de Lamto	Terrestrial	Bandama River Catchment	2,721	80	4	
	EQUATORIAL GUINEA						
GNQ1	Annobón	Terrestrial	none	2,871	0	1	Yes
GNQ2	Reserva Cientifica de la Caldera de Lubá	Terrestrial	none	51,075	100	3	Yes
GNQ3	Parque Nacional del Pico de Basilé	Terrestrial	none	32,256	100	1	Yes

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
	GHANA						
GHA1	Amansuri wetland	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	26,751	0	2	
GHA2	Ankasa Resource Reserve - Nini-Sushien National Park	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	47,444	95	4	
GHA3	Atewa Range Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	21,111	0	2	Yes
GHA4	Bia National Park and Resource Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	34,115	87	4	
GHA5	Boin River Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	30,530	0	5	
GHA6	Boin Tano Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	12,181	0	2	
GHA7	Bosomtwe Range Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	7,546	0	3	
GHA8	Bura River Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	9,996	0	4	
GHA9	Cape Three Points Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	4,545	0	2	Yes
GHA10	Dadieso Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	15,031	0	4	
GHA11	Draw River Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	19,391	0	2	
GHA12	Ebi River Shelterbelt Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	1,756	0	3	
GHA13	Fure River Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	14,046	0	4	
GHA14	Jema-Asemkrom Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	6,756	0	2	
GHA15	Kakum National Park - Assin Attandaso Resource Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	31,783	55	3	
GHA16	Kyabobo (proposed) National Park	Terrestrial	Togo Highlands	21,882	0	2	
GHA17	Mamiri Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	4,815	0	5	
GHA18	Mount Afadjato - Agumatsa Range Forest	Terrestrial	none	2,185	0	5	

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
GHA19	Neung South Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	11,974	0	2	
GHA20	Nsuensa Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	6,330	0	5	
GHA21	Pra-Sushien Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	18,721	0	3	
GHA22	Sapawsu Forest Reserve	Terrestrial	none	922	0	2	
GHA23	Shai Hills Game Production Reserve	Terrestrial	none	343	0	3	
GHA24	Southern Scarp Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	24,882	0	2	
GHA25	Subri River Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	55,930	0	2	
GHA26	Tano-Anwia Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	14,105	0	5	
GHA27	Tano-Ehuro Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	20,787	0	5	
GHA28	Tano-Nimiri Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	19,026	0	4	
GHA29	Tano-Offin Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	43,061	0	2	Yes
GHA30	Yoyo River Forest Reserve	Terrestrial	Forest Reserves of Southeastern Côte d'Ivoire & Southwestern Ghana	21,139	0	4	
	GUINEA						
GIN1	Chutes de la Sala	Terrestrial	none	1,440	0	4	
GIN2	Diécké	Terrestrial	Mount Nimba Complex	59,232	0	3	
GIN3	Forêt Classée de Balayan Souroumba	Terrestrial	none	22,479	0	2	
GIN4	Forêt Classée de Mont Bero	Terrestrial	Lofa-Gola-Mano Complex	27,483	0	3	
GIN5	Kabitaï	Terrestrial	none	4,970	0	3	
GIN6	Konkouré	Terrestrial	none	45,744	0	1	Yes
GIN7	Kounounkan	Terrestrial	none	10,644	0	4	
GIN8	Massif du Ziama	Terrestrial	Lofa-Gola-Mano Complex	91,481	0	2	

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
GIN9	Monts Nimba	Terrestrial	Mount Nimba Complex	14,562	100	3	
GIN10	Pic de Fon	Terrestrial	Lofa-Gola-Mano Complex	32,117	0	3	
GIN11	Sincery Oursa	Terrestrial	none	15,859	0	3	
	LIBERIA						
LBR1	Cestos - Senkwen	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	350,405	0	2	Yes
LBR2	Cestos/Gbi Area	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	316,490	0	4	Yes
LBR3	Cestos-Sapo North Corridor forest blocks	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	81,401	0	4	
LBR4	Gio National Forest	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	48,826	0	4	
LBR5	Grand Kru SouthEast Forest blocks	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	90,191	0	4	
LBR6	Grand Kru SouthWest blocks	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	55,111	0	4	
LBR7	Grebo	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	282,195	0	2	Yes
LBR8	Kpelle Forest	Terrestrial	Lofa-Gola-Mano Complex	216,898	0	3	
LBR9	Krahn Bassa South	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	203,020	0	3	
LBR10	Lake Piso	Terrestrial	None	24,859	0	4	
LBR11	Lofa-Mano Complex	Terrestrial	Lofa-Gola-Mano Complex	437,854	0	2	Yes
LBR12	Nimba mountains	Terrestrial	Mount Nimba Complex	13,254	0	2	Yes
LBR13	Sapo - Grebo Corridor	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	197,421	0	3	
LBR14	Sapo National Park	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	155,084	0	2	Yes
LBR15	West Nimba	Terrestrial	none	11,625	0	3	
LBR16	Wologizi mountains	Terrestrial	Lofa-Gola-Mano Complex	167,985	0	2	
LBR17	Wonegizi mountains	Terrestrial	Lofa-Gola-Mano Complex	28,868	0	2	Yes

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
LBR18	Zwedru	Terrestrial	Cestos-Sapo-Grebo-Taï-Cavally Corridor	64,458	0	1	Yes
	NIGERIA						
NGA1	Afi River Forest Reserve	Terrestrial	Korupmba-Obachap	51,975	0	2	
NGA2	Akassa Forests	Terrestrial	Lower Niger Delta	8,333	0	5	
NGA3	Biseni forests	Terrestrial	Lower Niger Delta	21,619	0	3	
NGA4	Cross River National Park: Oban Division	Terrestrial	Korupmba-Obachap	268,952	100	3	Yes
NGA5	Gashaka-Gumti National Park	Terrestrial	Korupmba-Obachap	586,803	100	4	Yes
NGA6	IITA Forest Reserve, Ibadan	Terrestrial	none	327	0	2	
NGA7	Mbe Mountains and Cross River National Park: Okwangwo Division	Terrestrial	Korupmba-Obachap	95,288	54	2	Yes
NGA8	Ngel-Nyaka Forest Reserve	Terrestrial	Korupmba-Obachap	3,004	0	2	
NGA9	Obudu Plateau	Terrestrial	Korupmba-Obachap	70,743	0	2	Yes
NGA10	Okomu National Park	Terrestrial	Lower Niger Delta	111,626	100	4	
NGA11	Omo Forest Reserve	Terrestrial	none	131,908	0	2	
NGA12	Upper Orashi forests	Terrestrial	Lower Niger Delta	9,883	0	3	
	SÃO TOMÉ AND PRÍNCIPE						
STP1	Parque Natural Obô do Príncipe	Terrestrial	none	5,670	0	1	Yes
STP2	Parque Natural Obô de São Tomé e Zona Tampão	Terrestrial	none	44,830	0	1	Yes
STP3	Zona Ecológica dos Mangais do Rio Malanza	Terrestrial	none	229	0	1	Yes
STP4	Zona Ecológica da Praia das Conchas	Terrestrial	none	522	0	1	Yes
	SIERRA LEONE						
SLE1	Gola Forest Reserve	Terrestrial	Lofa-Gola-Mano Complex	74,612	100	1	
SLE2	Kambui Hills Forest Reserve	Terrestrial	Lofa-Gola-Mano Complex	14,012	0	2	

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
SLE3	Kangari Hills Non-hunting Forest Reserve	Terrestrial	none	11,743	0	3	
SLE4	Loma Mountains Non-hunting Forest Reserve	Terrestrial	none	26,782	100	4	
SLE5	Sierra Leone River Estuary	Terrestrial	Sierra Leone Coastal Corridor	55,823	0	2	
SLE6	Tingi Hills Non-hunting Forest Reserve	Terrestrial	none	14,293	100	4	
SLE7	Tiwai Island Game Sanctuary/Non-hunting Forest Reserve	Terrestrial	none	1,251	0	2	
SLE8	Western Area Peninsula Non-hunting Forest Reserve	Terrestrial	Sierra Leone Coastal Corridor	16,414	100	1	Yes
SLE9	Yawri Bay	Terrestrial	Sierra Leone Coastal Corridor	54,674	0	2	Yes
	TOGO						
TGO1	Fazao-Malfakassa National Park	Terrestrial	Togo Highlands	215,337	100	4	
TGO2	Missahoe Forest Reserve	Terrestrial	none	1,225	0	2	
	FRESHWATER KBAS						
fw1	Lake Barombi Mbo and surrounding catchments	Freshwater	Korupmba-Obachap	176,536	100	1	Yes
fw2	Lake Bermin and surrounding catchments	Freshwater	Korupmba-Obachap	152,302	0	1	
fw3	Lower Bandama River	Freshwater	Bandama River Catchment	315,998	0	2	
fw4	Lower reaches of St Paul River	Freshwater	Lofa-Gola-Mano Complex	444,939	0	2	
fw5	Lower Volta eastern catchment	Freshwater	none	91,184	0	2	
fw6	Gbangbaia River Basin	Freshwater	Sierra Leone Coastal Corridor	266,478	0	2	Yes
fw7	Middle reaches of St Paul River	Freshwater	Lofa-Gola-Mano Complex	226,000	0	1	
fw8	Rhombe Swamp and Mouth of Little and Great Scarcies Rivers	Freshwater	Sierra Leone Coastal Corridor	88,460	0	1	Yes
fw9	São Tomé	Freshwater	none	90,467	0	1	
fw10	South East Niger Delta - near Calabar	Freshwater	Korupmba-Obachap	269,451	0	2	Yes
fw11	Upper reaches of St Paul River	Freshwater	Lofa-Gola-Mano Complex	366,131	0	2	
fw12	Weeni creek - Grand Bassa County	Freshwater	Cestos-Sapo-Grebo-Taï-Cavally Corridor	104,738	0	1	

Map Code	Key Biodiversity Area	Realm	Conservation Corridor	Area in Hectares	Overlap with Protected Areas[1] (%)	Biological Priority Score	CEPF Priority
fw13	West Niger Delta	Freshwater	Lower Niger Delta	493,149	0	2	Yes

[1] Overlap with protected areas is calculated as the percentage of the total KBA area that spatially overlaps IUCN Category I-IV Protected Areas.

Appendix 6: Additional Socio-economic Data

Key Demographic + Ecological Footprint Measures for the Guinean Forests of West Africa Hotspot Countries

Country	Land area in sq. km (2008)[1]	Population density (no. of people per sq. km, 2011 popn. data)[2]	Population in 2012 (millions)**	Projected population in 2030 (millions)**	Annual population growth rate (%)** 2000-2005	Annual population growth rate (%)** *estimate* 2010-2015	Ecological Footprint of Consumption ++ (global ha. per capita, 2010)	Total biocapacity ++ (global ha. per capita, 2010)	Ecological (Deficit) or Reserve ++ (global ha. per capita, 2010)
Benin	112,622	87	9.4	14.6	3.2	2.7	1.2	0.8	(0.4)
Cameroon	475,442	45	20.5	28.8	2.3	2.1	1.0	1.9	0.8
Côte d'Ivoire	322,463	61	20.6	29.8	1.7	2.2	1.0	1.7	0.7
Equatorial Guinea	28,051	26	0.7	1.1	3.1	2.7	2.4 approx. *(read off graph: 2009)*	4.2 approx. *(read off graph: 2009)*	1.8?
Ghana	238,553	109	25.5	36.5	2.4	2.3	1.8	1.2	(0.6)
Guinea	245,857	45	10.5	15.9	1.6	2.5	1.7	2.8	1.1
Liberia	111,369	42	4.2	6.5	2.2	2.6	1.3	2.5	1.2
Nigeria	923,768	180	166.6	257.8	2.5	2.5	1.4	1.1	(0.3)
São Tomé e Príncipe	964	191	0.2	0.2	1.6	2.0	1.7 approx. *(read off graph; 2009)*	0.75 approx. *(read off graph; 2009)*	(0.95)?
Sierra Leone	71,740	82	6.1	8.5	4.4	2.1	1.1	1.2	0.1
Togo	56,785	119	6.3	8.7	2.4	2.0	1.0	0.6	(0.4)

++ Global Footprint Network: National Ecological Footprint Account (NFA) Tables 2010 Results: (http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_for_nations/) Footprint **Global average: 2.7**; **African average: 1.4** global ha. per capita.

Ecological Footprint: A measure of how much area of biologically productive land and water an individual, population or activity requires to produce all the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices. The Ecological Footprint is usually measured in global hectares, which makes data and results globally comparable. For a city or a nation, it is simply the sum of the Ecological Footprint of all the residents of that city or nation. Because trade is global, an individual or country's Footprint includes land or sea from all over the world. Ecological Footprint is often referred to in short form as Footprint. Footprint varies each year with consumption and production efficiency.

[1] UNEP (2008): "Africa: Atlas of our Changing Environment"
[2] World Bank (2013) The World Bank – World Development Indicators: Table 1.1 Size of the Economy http://wdi.worldbank.org/table/1.1
**UNDP (2013) Human Development Report 2013 – The Rise of the South: Human Progress in a Diverse World. Table 14: Population trends

Biological Capacity or Biocapacity: The capacity of ecosystems to produce useful biological materials and to absorb waste materials generated by humans, using current management schemes and extraction technologies. “Useful biological materials” are defined as those demanded by the human economy. Hence what is considered “useful” can change from year to year. The biocapacity of an area is calculated by multiplying the actual physical area by the yield factor and the appropriate equivalence factor. Biocapacity is usually expressed in global hectares. Biocapacity varies each year with ecosystem management, agricultural practices (such as fertilizer use and irrigation), ecosystem degradation, weather and population size.

Importance of Agricultural Sector in Hotspot Countries, 2000 to 2013

Country	**Rural popn. as % of total popn.[3] (%) (2012)**	**% Land under agriculture (arable land + permanent crops)[4]**	**% Total labour force in agriculture[5] (2013)**	**Females as % of total labour force in agric.[6] (2013)**	**Total GDP (2000)[7] ($ billions)**	**Total GDP (2012)[5] ($ billions)**	**Agriculture share of GDP (2000)[5] (%)**	**Agriculture share of GDP (2012)[5] (%)**
Benin	54.4	25.5	41.5	40.1	2.4	7.6	35	32
Cameroon	47.3	16.1	43.9	46.8	9.3	25.3	22	nd
Côte d’Ivoire	48.0	23.0	34.8	35.7	10.4	24.7	24	nd
Equatorial Guinea	60.4	7.1	62.8	42.8	1.2	17.7	10	nd
Ghana	47.4	33.4	53.6	45.3	5.0	40.7	39	23
Guinea	64.1	14.4	78.5	50.2	3.0	5.6	22	21
Liberia	51.5	6.5	60.3	43.7	0.5	1.7	76	39
Nigeria	49.7	43.0	22.7	40.6	46.4	262.6	26	33
São Tomé and Príncipe	36.6	49.7	55.9	50.0	0.1	0.3	12	nd
Sierra Leone	60.4	17.2	58.2	61.6	0.6	3.8	58	57
Togo	61.5	50.0	51.6	42.2	1.3	3.8	35	31

Notes: nd = no data.

[3] UNDP (2013) Human Development Report 2013 – The Rise of the South: Human Progress in a Diverse World. Table 14: Population trends.
[4] FAOSTAT accessed February 2014 – *2011 data*
[5] FAOSTAT Country Profiles accessed February 2014 –data 2013- *http://www.fao.org/countryprofiles/index/en/?lang=en*
[6] FAOSTAT Country Profiles accessed February 2014 – data 2013- *http://www.fao.org/countryprofiles/index/en/?lang=en*
[7] http://wdi.worldbank.org/table/4.2 The World Bank 2013 World View 4.2 World Development Indicators: structure of output

Primary Designated Functions of Forest and proportion of Forest in Protected Areas in Hotspot Countries in 2010[8]

Country	Total forest area (1000 ha) (2010)	Primary designated function (%) (2010)							Forest within protected areas (% of total forest area) (2010)
		Production	Water and soil protection	Conservation of biodiversity	Social services	Multiple use	Other	None or unknown	
Benin	4,561	31	0	28	n.s.	40	0	0	28
Cameroon	19,916	73	3	17	1	6	n.s.	0	46
Côte d'Ivoire	10,403	89	3	8	n.s.	0	0	0	8
Equatorial Guinea	1,626	5	0	36	3	53	3	0	36
Ghana	4,940	23	7	1	1	0	0	68	1
Guinea	6,544	2	9	46	0	7	0	36	4
Liberia	4,329	25	0	4	0	0	0	71	4
Nigeria	9,041	29	0	28	0	0	0	43	28
São Tomé e Príncipe	27	-	-	-	-	-	-	-	-
Sierra Leone	2,726	9	0	7	0	0	0	84	7
Togo	287	68	16	16	0	0	0	0	-

Notes: ns = 'not significant' (i.e., very small value).

8 FAO (2012) Global Forest Resources Assessment (FRA): Main Report and Global Tables 2010. FAO Forestry Paper 163. FAO Rome. http://www.fao.org/forestry/fra/fra2010/en/

Forest Cover and Trends 1990-2010[9]

Country	Total forest cover (1,000 ha) (2010)	Forest cover as % of total land area (%) (2010)	Annual change rate – forest area 1990-2000		2000-2005		2005-2010		Planted forest (1,000 ha) (2010)	Forest within protected areas (2010)	
			1,000 ha/ year	%	1,000 ha/ year	%	1,000 ha/ year	%		(1,000 ha)	(% total forest area)
Benin	4,561	41	-70	-1.29	-50	-1.01	-50	-1.06	19	1,263	28
Cameroon	19,916	42	-220	-0.94	-220	-1.02	-220	-1.07	-	9,105	46
Côte d'Ivoire	10,403	33	11	0.10	15	0.15	n.s.	n.s.	337	808	8
Equatorial Guinea	1,626	58	-12	-0.65	-12	-0.67	-12	-0.71	n.s.	586	36
Ghana	4,940	22	-135	-1.99	-115	-1.97	-115	2.19	260	43	1
Guinea	6,544	27	-36	-0.51	-36	-0.53	-36	-0.54	93	242	4
Liberia	4,329	45	-30	-0.63	-30	-0.66	-30	-0.68	8	194	4
Nigeria	9,041	10	-410	-2.68	-410	-3.33	-410	-4.00	382	2,509	28
São Tomé e Príncipe	27	28	0	0	0	0	0	0	0	-	-
Sierra Leone	2,726	38	-20	-0.65	-20	-0.68	-20	-0.70	15	187	7
Togo	287	5	-20	-3.37	-20	-4.50	-20	-5.75	42	-	-

Notes: ns = 'not significant' (i.e., very small value).

[9] FAO (2012) Global Forest Resources Assessment (FRA): Main Report and Global Tables 2010. FAO Forestry Paper 163. FAO Rome. http://www.fao.org/forestry/fra/fra2010/en/

Major commodities grown in Hotspot countries: area harvested (ha) by country in 2012[10]

Benin		Cameroon		Côte d'Ivoire		Equatorial Guinea		Ghana	
Maize	938,846	Cacao, beans	670,000	Cacao, beans	2,500,000	Cassava	23,000	Cacao, beans	1,600,300
Cashew nuts, with shell	468,000	Beans, dry	300,000	Cashew nuts, with shell	900,000	Sweet potatoes	18,000	Cassava	868,550
Cassava	247,754	Cassava	290,000	Cassava	360,000	Coffee, green	12,500	Groundnuts, with shell	345,186
Groundnuts, with shell	140,014	Cow peas, dry	285,000	Coffee, green	160,000	Plantains	7,100	Cashew nuts, with shell	1,000
Coconuts	130,000	Coffee, green	210,000	Beans, dry	39,000	Bananas	6,000	Coconuts	60,000
		Bananas	85,000	Coconuts	38,000			Karite (shea) nuts	30,500

Guinea		Liberia		Nigeria		São Tomé e Príncipe		Sierra Leone		Togo	
Maize	490,000	Rice, paddy	250,000	Cassava	3,850,000	Cacao, beans	20,000	Cassava	490,000	Maize	576,000
Millet	315,000	Rubber, natural	76,000	Cow peas, dry	3,200,000	Coconuts	13,500	Groundnuts, with shell	125,000	Beans, dry	360,000
Fonio	300,000	Cacao, beans		Groundnuts +shell	2,420,000	Bananas	5,300	Cacao, beans	50,000	Cassava	155,000
Groundnuts, with shell	218,000	Cassava	70,500	Cacao, beans	1,196,000	Taro (cocoyam)	3,700	Maize	47,000	Groundnuts, with shell	66,000
Maize, green		Plantains	63,000	Fruit, citrus	800,000	Oil palm	1,670	Millet	33,500	Coffee, green	27,000
Cassava	132,000	Oil palm	21,500	Fonio	165,000			Oil palm	27,000		
	128,000		17,000								

[10] (all data for 2012; FAOSTAT – *accessed Feb 18, 2014*)

Appendix 7: Details of Governance Structures in Each Hotspot Country

Benin

Formerly Dahomey, the officially termed Republic of Benin is a presidential representative democratic republic, with the president comprising the head of state, government and of a multi-party system. The primary legislative body in Benin is the National Assembly, for which deputies are elected every four years. Absolute majority presidential elections are held every five years, and individual presidents can serve for up to two terms. The government exercises executive power, whereas legislative power is conferred on the government and legislature. The current political system replaced the People's Republic of Benin (1975–1990) and is derived from the 1990 Constitution of Benin. While this constitution has been beneficial to the country's economy, several problems are still present, most notably the non-successful separation of the political from the judiciary system. The Economist Intelligence Unit refers to the country's political system as a hybrid regime, with an appointed democracy index of 5.65 – ranging from 1.00 (authoritarian regime) to 9.99 (full democracy). For administration purposes, Benin is divided into twelve departments, which in turn are subdivided into 77 communes.

Cameroon

The Republic of Cameroon is a unitary presidential republic, whereby the president is head of the state, the government and a multi-party system. Executive power is exercised by the government, and legislative power by the government and the National Assembly of Cameroon. This power lies in effect decidedly in the hands of authoritarian President Paul Biya and his Cameroon People's Democratic Movement party since 1982. The 1972 constitution of the republic (reformed in 1996) allows for a powerful central government: The president is in full control, whereby he is not required to take counsel from the National Assembly in order to among others appoint or dismiss members of cabinet, generals, provincial governors, prefects, subprefects, and approve or veto regulations. A constitutional amendment that eliminated presidential term limits has been passed in 2008. Although Cameroon has experienced high social and political stability, poverty is still serious for many people and the human rights record remains flawed. The Economist Intelligence Unit lists the government as an authoritarian regime, with a democracy index of 3.41.

Cameroon is divided into ten semi-autonomous regions, each administrated by an elected Regional Council. The president also appoints a governor with broad powers to execute his will at each region and to control smaller administrative units. The regions are split into 58 divisions headed by presidentially appointed divisional officers (prefects); these comprise in turn subdivisions, headed by subprefects. The smallest administrative units are the districts, managed by district heads. Some regions of the country have grown increasingly distanced from the government, and politicians have requested greater decentralization of power and even secession.

Côte d'Ivoire

The Republic of Côte d'Ivoire (previously also Ivory Coast) is a presidential representative democratic republic. The government exercises executive power while legislative power is held by the government and parliament. Civil wars, the second of which ended in 2011, have hindered the election process in the country, as well as having caused significant human rights problems. The constitution of 1959 provides for a strong presidency within a separation of powers framework. The president, who is elected by popular vote for a five-year term (last elections held in 2000), selects members of the cabinet as well as the prime minister, discusses and ratifies treaties, and submits bills to the National Assembly. This assembly comprises 225 members – each elected for five years in constituencies of single seats – and agrees on legislation typically introduced by the president. A single party is dominant in Côte d'Ivoire, the Ivorian People's Front. Some proposed changes include the extension of term to seven years and the formation of a senate. Côte d'Ivoire holds a democracy index of 3.53, ranked by the Economist Intelligence Unit as an authoritarian regime.

Legislative power is exerted onto the 58 departments of Côte d'Ivoire, each appointed a prefect by the central government. These are split into 196 communes; each is headed by an elected mayor, with the city of Abidjan, the economic capital, having ten mayors.

Equatorial Guinea

Politics in the Republic of Equatorial Guinea take place within a presidential republic framework, in which the president is head of both the state and government. Executive power lies with the government, while legislative power is vested in both the government and the Chamber of People's Representatives. Since the country's independence from Spain in 1968, Equatorial Guinea has had two presidents. The latest is still in power – Teodoro Obiang Nguema Mbasogo assumed presidency in 1979 after a coup d'état and the execution of former president Francisco Macías Nguema, his uncle; he is elected to a seven-year term by popular vote. Obiang receives significant powers from the 1982 constitution, including: Calling of elections, dissolution of the Chamber of Representatives, choice of cabinet members, appointing and control of the prime minister, treaty negotiation and ratification, and decree of laws. One hundred members form the Chamber of People's Representatives, which are elected for five years in multi-member constituencies. Only one political party, the Democratic Party of Equatorial Guinea, holds effective power. The country holds one of the lowest democracy indices globally, 1.66, being characterized as an authoritarian regime.

The government administers the country through seven provinces, for which the president appoints governors. For administration purposes, each province is split into districts and municipalities.

Ghana

Like most countries in West Africa, the political system in the Republic of Ghana is described as a presidential representative democratic republic, with the President of Ghana being head of state and government and of a multi-party system. Executive power is exercised by the government at Golden Jubilee House. Legislative power is conferred upon the government and Parliament. Judiciary power acts independently of the executive and the legislature. The Fourth Republic of Ghana was established with a constitution that provides a framework for a republican democratic government, aiming at power sharing, and the prevention of coups, dictatorial government and single-party systems. It declares Ghana a unitary republic and intends for power to be shared between the president, a unicameral parliament, a state council and an independent judiciary. The 275-member Parliament controls legislative functions and agrees with the president on the formation of laws. Members are elected by simple majority vote for four years in single-seat constituencies, in 275 electoral constituencies. Ghana has two dominant political parties. The country holds one of the highest democracy indices in the region, 6.33, termed a flawed democracy by the Economist Intelligence Unit.

The country is divided into ten administrative regions, split into six metropolitan assemblies: 55 municipal assemblies and 216 districts, each with a district assembly. Various types of councils exist in lower levels, including 58 town or area councils, 108 zonal councils and 626 area councils. On the lowest level, 16,000 unit committees are present.

Guinea

The Republic of Guinea is a presidential representative democratic republic, where the President is head of both the state and the government. The government exercises executive power, while legislative power is exercised by the government and the National Assembly, however the latter has not met since 2008 after its dissolution following the 2008 coup d'état. The President, who governs the country with the council of 25 presidentially appointed civilian ministers is typically elected for seven years by popular vote. Elections in Guinea have been postponed multiple times, and in 2012, the President of Guinea postponed them indefinitely, stating the need for them to be "transparent and democratic". The political system of the country has been ranked as an authoritarian regime, with a democracy index of 3.01.

Guinea is divided into seven regions (eight with the capital, Conakry, which is a special zone), 33 prefectures, over 100 subprefectures, and many districts. The president appoints officials for every level of a highly centralized administration, except for district-level leaders, who are elected.

Liberia

The Republic of Liberia is a presidential representative democratic republic, with the President being head of state and of government. Liberia's political system is under an ongoing transition from civil war and dictatorship to democracy. It has been modeled on that of the United States with three branches of government, however unlike the US and much like most countries of West Africa, Liberia is a unitary state with a multi-party system, rather than a federation with a two-party system. The President of Liberia typically exerts the most control on the country's politics; the government exercises executive and legislative power, while the Senate and the House of Representatives exert legislative power. The president is elected for six years (renewable term) by popular vote, and appoints a cabinet, which is confirmed by the Senate. The latter has 30 seats, with members serving nine-year terms and elections taking place by popular vote. The House of Representatives has 64 seats (popular vote and six-year terms). Liberia is ranked by the Economist Intelligence Unit as a hybrid regime, with a democracy index of 4.95.

The town chief comprises the basic unit of Liberian local government. Also present are clan chiefs, paramount chiefs, and district commissioners. The 15 counties of Liberia are governed by presidentially appointed superintendents.

Nigeria

Nigeria is a federal republic whose political system is modeled, like Liberia, on that of the United States, where the president, who is elected through universal suffrage, exercises executive power. The governing structure of Nigeria has also been influenced by the Westminster Parliamentary system. Nonetheless, the president comprises the head of government, state and of a multi-party system. The Nigerian governmental framework is a federal, presidential, representative democratic republic, where legislative power is vested on the government and the two legislature chambers, namely, the House of Representatives (360 members; four-year terms) and the Senate (109 members; four-year terms). Together these form the National Assembly, responsible for law making in the country. The Supreme Court of Nigeria holds the highest judiciary power in Nigeria. The country practices the theory of the separation of powers. The Nigerian legal system's basis is on the rule of law, the independence of the judiciary, and British common law. It is comparable to the English and Welsh legal system. The legal framework for this system is provided by the Constitution of Nigeria. Nigeria has a very low democracy index, 3.75, and is considered an authoritarian regime.

Administratively, the country is split into 36 states and one territory, with each state divided into Local Government Areas, of which 774 exist.

São Tomé and Príncipe

Unlike other countries of the hotspot, the Democratic Republic of São Tomé and Príncipe is a unitary semi-presidential representative democratic republic, in which the President is head of state, while the Prime Minister is head of government, and of a multi-party system. The government exercises executive power, whereas legislative power is held by both the government and the National Assembly. The Judiciary is independent of both the executive and the legislature. The president of the republic is elected by a majority popular vote and a ballot for five-year terms (maximum two consecutive). The president appoints the prime minister, who must be ratified by the majority party, and who in turn names 14 cabinet members. The National Assembly has 55 members, elected for four years, and is the highest state organ and legislative body.

For administration purposes, the country is divided into seven municipal districts. The governing councils in these districts, which are reelected every five years, hold a limited degree of autonomous power. Príncipe, comprising its own district, has been self-governed since 1995.

Sierra Leone

The governing authority of the Republic of Sierra Leone is established by the Sierra Leone Constitution, which describes the country as a presidential representative democratic republic, where the President is head of state and government, and of a multi-party system. The government is split into the executive, legislative and judicial, the latter being independent of the former two, whereby the president exercises executive power, while legislative power is conferred on the Parliament. The President is elected by popular vote for five years and names the Ministers of State, who are approved by the House of Representatives of 124 members (112 elected for four-year terms, and 12 Paramount chiefs). Civil rights are respected by the Sierra Leonean government. Sierra Leone is considered to be a hybrid regime, holding a democracy index of 4.56.

The country is split into provinces, districts, and chiefdoms. There are three rural provinces, in addition to the capital city administrative province. Fourteen districts exist: Twelve rural and two for Freetown, the capital. Sierra Leone is further divided into 149 chiefdoms, which comprise local governance as tribal and hereditary units.

Togo

The Togolese Republic is a presidential republic, with the president being head of both state and government. Executive power is vested in the government, while legislative power is conferred upon the government and parliament. Since independence from France in 1960, the political system of the country has been dominated by the authoritarian party Rally for the Togolese People, making Togo a one party dominant state. While opposition parties are not forbidden, they are thought to be extremely unlikely to gain power. The President of Togo is elected for a five-year term by popular vote, and names the prime minister, as well as the Council of Ministers (on the prime minister's advise). The National Assembly comprises 81 single-seat constituencies, members for which are elected for five years. The country's judiciary is modeled on the French system, comprising the Court of Appeal and Supreme Court. The African Union considers the current president's rise to power a military coup d'état, while the political system of the country has been described as an authoritarian regime by the Economist Intelligence Unit, giving it a democracy index of 3.45 out of 10.

Administratively, Togo is divided in five regions and 30 prefectures, each having an appointed prefect.

Appendix 8: Details of the NBSAP Process in Each Hotspot Country

The NBSAP for Benin was developed through a long consultative and iterative process and was published in 2002. It provides a strategic roadmap for sustainable development over the period from 2002 to the next five years, while the 2014 fifth national report evaluates progress for the period of 2011 to 2020 (Republic of Benin 2002; 2014). The NBSAP lists the following main goals:

- Capacity development of structures and stakeholders in the management of biological diversity;
- Promotion of research;
- Promotion of values and relevant endogenous know-how;
- Valuation of genetic resources;
- The development of cooperation at the national, regional and international level in science, technology and biotechnology.

Cameroon published its first NBSAP in 1999, which was later revised in 2012 (NBSAP II). It is the fruit of valuable contributions from key actors involved in the protection of the nation's biodiversity and national and international experts in biodiversity protection and acts within the 2035 Cameroon's national Vision for Development and its Growth and Employment Strategy (Republic of Cameroon 1999; 2012). The NBSAP lists the following main strategic objectives:

- Increasing awareness on the value of biodiversity to ensure a change in human behavior and attitudes that today favor biodiversity loss;
- Strengthening efforts in mitigating or restoring degraded ecosystems and species to redress the consequences of biodiversity loss;
- Focus on human wellbeing for more proactive measures to generate wealth from biodiversity and the services offered by the ecosystems;
- Recognizing mainstreaming as the most appropriate approach to ensure the effective appropriation of NBSAP II by key sectors and decentralized authorities.

The NBSAP for Côte d'Ivoire, published in 2002, was the result of evaluation, analysis and consultation conducted during regional and national workshops for formulation and validation that took place in 2000, 2001 and 2002, aimed at improved management by 2025 (Republic of Côte d'Ivoire 2002). It lists the following eight fundamental themes:

- Conservation of biological diversity;
- Use and enhancement of biodiversity;
- Education and information;
- Awareness and participation of the population;
- Training and research for the integration of spiritual values and traditional knowledge in the conservation of biological diversity;
- Improvement of the legislative and institutional framework;
- Fair and equitable sharing of benefits from the exploitation of biological resources;
- Management of biotechnology and biosafety.

Equatorial Guinea published its NBSAP in 2005 (Republic of Equatorial Guinea 2005). It lists, among other aspects, the following goals:

- Concrete content and appropriate legal and practical development to constitutionally guarantee the right to live in a sustainable environment to all persons;
- Establishment of an institutional framework to promote at a national level the solution of

environmental problems that have been generated from a global approach;

- Creation of tools for efficient environmental management that allows for adequate protection of natural resources;
- A general legal body that can serve as reference for any other sectoral environmental legislation.

The NBSAP of the Republic of Ghana, published in 2002, proposes among others the following actions (Republic of Ghana 2002):

- Capacity building to ensure in-depth assessment of biological resources;
- Promotion of community participation in sustainable management of biodiversity;
- Strengthening of the management of forests and protected areas as well as other off-reserve biological resources.

Guinea published an NBSAP in 2002, for which 13 national and regional experts were consulted (Republic of Guinea 2002). It proposes the following main goals and objectives:

- Conservation of terrestrial and aquatic ecosystems and their biodiversity;
- Access to resources and equitable sharing of revenues from their exploitation;
- Valuation of ecosystems and their biodiversity;
- Strengthening the institutional and legal framework.

Liberia's NBSAP was published in 2004 and focused on the 2010 target for reversing biodiversity loss as called for by the Johannesburg Plan of Implementation. It comprises the work of fully participatory national and international actors (Republic of Liberia 2004). The country has since embarked on a medium-term economic growth and development strategy, "The Agenda for Transformation", in order to guide development activities over the years 2012 to 2017, publishing its Fifth National Report (Republic of Liberia 2014). The NBSAP lists the following five goals, namely to:

- Maintain ecosystems and ecological processes essential for the functioning of the biosphere;
- Ensure sound management of the natural resources and the environment;
- Adequately protect humans, flora, fauna, and their biological communities and habitats against harmful impacts, and preserve biological diversity;
- Integrate environmental considerations in sectoral and socio-economic planning at all levels throughout the nation;
- Find common solutions to environmental problems at regional and international levels.

The Nigerian NBSAP was published in 2006, with the participation of various agencies of the Federal and State governments, academia, non-governmental agencies and local communities through national and regional level consultative workshops (Republic of Nigeria 2006). It states four main objectives:

- Expansion and improvement of the information base on the biodiversity of Nigeria;
- Development and institutionalization of systems to monitor key elements of biodiversity;
- Institutionalization of an environmental resource accounting system to monitor key elements of biodiversity;
- Establishment of local evaluation and assessment of forest resources.

The Democratic Republic of São Tomé and Príncipe published its NBSAP in 2005, following a participatory and interactive process (Democratic Republic of São Tomé and Príncipe 2005). The NBSAP lists among others the following goals:

- Strengthening of *in situ* and *ex situ* conservation;
- Valuation of biodiversity;
- Creation of mechanisms for access, and fair and equitable sharing of biological resources at the national and international level;
- Conservation of marine and coastal ecosystems, forest ecosystems and agro-ecosystems;
- Strengthening of institutional and legal framework, working as a transverse theme.

The Sierra Leonean NBSAP was published in 2006 with a vision towards the reconstruction and development of the country by the end of 2025 (Republic of Sierra Leone 2006). It is intended to:
- Provide a framework for setting priority policies and actions for the conservation and sustainable use of biological diversity in Sierra Leone;
- Catalyze and provide guidance for legal policy and institutional reforms necessary to achieve effective conservation and sustainable use of biological diversity;
- Enhance the planning and coordination of national efforts aimed at the conservation and sustainable use of biological diversity;
- Guide the investment and capacity building programs for the conservation and sustainable use of biodiversity;
- Facilitate information sharing and coordinated action among the various stakeholders at the national level and foster scientific and technical cooperation with other countries and international organization.

Togo published its NBSAP in 2007 through a process initiated by the Ministry of Environment and Forest Resources and supported by national consultants and scientific and steering committees. It proposes the following main goals:
- Legal capacity building for conservation and sustainable use of biodiversity;
- Capacity building of institutions and technical stakeholders;
- Strengthening national capacity for characterization and monitoring of biological diversity;
- Consolidation of conservation priority protected areas within the national system of protected areas;
- Increasing representation of Togolese Afromontane ecosystems within the national system of protected areas;
- Increasing representation of wetland ecosystems in Togo;
- Development of conservation initiatives in rural and urban areas through a micro-reserve network;
- Sustainable management of natural forest and savanna formations allocated to production targets and/or protection.

Appendix 9: Overview of Conservation Approaches Linked to Threats in the Guinean Forests of West Africa Hotspot

Threats/drivers	Examples of key actors	Approaches for mitigation	Current/previous examples of approaches
Hunting for bushmeat/wildlife trade Overexploitation of fisheries	Communities and specific user groups – harvesting for own use/ consumption Communities – traders/ small enterprise Industry/ private sector/ national and multi-nationals (logging, offshore fisheries, oil) and knock-on effects (e.g. increased bushmeat demand around logging camps) Urban/ international markets and traders Artisanal fisheries Industrial fisheries including national and international trawler fleets e.g. from the European Union, Korea and Japan	Regional partnerships (to govern marine/wildlife resources)	- Canary Current Large Marine Ecosystem (CCLME) initiative - Guinea Current Large Marine Ecosystem (GCLME) project
		Creation/extension of protected areas	- WWF 's West African Marine Ecoregion program
		Community-based natural resource management (CBNRM) (of areas and wildlife)	- Marine Protected Areas (MPA) co-management(Sierra Leone and Liberia) - Bushmeat hunting and trade in the Nimba Mountains project (Guinea) - Community wildlife sanctuaries (e.g. Ghana) - Co-management of Pendjari Biosphere Reserve (Benin)
		Alternative livelihoods	- Guinea Eco-Development Project (Guinea) - Conservation and Sustainable Use of the Ngoyla-Mintom Forest Project (Cameroon)
		Research and policy/strategy development	- Addressing the Threat of the Bushmeat Trade to Wildlife in the Upper Guinea Forest (Ghana) - Rural Bushmeat and Public Opinion survey (Liberia)
		Demand-side measures and awareness raising	- Awareness Campaign on the Bushmeat Crisis (Ghana) - Campaigns in China, Vietnam etc (Traffic, WildAID)
Unsustainable logging/timber trade Fuelwood collection Charcoal production	Communities and specific user groups – harvesting for own use/ consumption Urban/international markets and traders Chainsaw operators/ illegal and black market trade Some large-scale logging companies, e.g. inCameroon: GRUMCAM(a subsidiary of Italian owned ALPI), PALLISCO (a subsidiary of French PASQUET Group), CFCandCUF(bothCameroonian) Small-scale and large scale wood processing businesses	Sustainable forest management/RIL	- Wildlife Wood Project (Cameroon) - FSC certification: 20 certificates (COC and FM) in Cameroon; 16 certificates (COV and FM) in Ghana; 1 certificate (COC) in Nigeria;
		Forest Law Enforcement Governance and Trade (FLEG and FLEGT)	- Convergence Plan for the Sustainable Management and Conservation of Forest Ecosystems in West Africa (Draft) (ECOWAS) - FLEGT Voluntary Partnership Agreements (VPA) (VPAs being implemented with Cameroon, Ghana, Liberia; under negotiation with: Côte d'Ivoire)
		Community forestry/participatory forest management	- Community forestry by-laws and Forest Management Committees (Nigeria) - County Forest Forums (Liberia)
		Wood processing/industry sustainability	- Developing alternatives for illegal CSM (chain saw milling) through Multi- Stakeholder Dialogue (MSD) (Ghana) - Competitive value chains project (Cameroon)
		Fuel wood/charcoal	- Efficient Fuel Wood Stoves for Nigeria (CDM project,)

Threats/drivers	Examples of key actors	Approaches for mitigation	Current/previous examples of approaches
		sustainability	- International Biochar initiative (e.g. Ghana) - International Network for Bamboo and Rattan (INBAR) bamboo charcoal (Ghana)
Agricultural expansion (including commercial plantations) Insecure land tenure/lack of investment in land	National and international companies: Rubber - Firestone, Liberia Agricultural Company, Guthrie, and Liberia Company Palm Oil - Presco Plc, Okomu Oil Palm Company Plc. (in Nigeria), Dekel Oil (in Côte d'Ivoire), Ghana Oil Palm Development Company Ltd., Twifo Oil Palm Plantations Ltd., Benso Oil Palm Plantations Ltd. (Ghana), SOCAPALM, SAFACAM, Swiss Farm, CDC and PAMOL (Cameroon) Affected communities/farmer organisations Government agencies responsible for land-use planning, agricultural investment, approvals Bilateral and multilateral partnerships/initiatives in the agricultural sector, e.g. RSPO, G8 New Alliance for Food Security and Nutrition	Landscape/regional approaches	- WWF Kudu-Zombo Programme, Campo Ma'an National Park (Cameroon) - Conservation of the Western Area Peninsula Forest Reserve (WAPFoR) and its Watersheds (Sierra Leone)
		Improvement of PA management	- Strengthening the Conservation Role of Togo's National System of Protected Areas - Protected Area Project for Comoe National Park (Côte d'Ivoire) - Biodiversity and Protected Area Management Programme (BIOPAMA) (regional)
		Establishment of conservation corridors and transboundary PAs	- Gola Peace Park/Across the River project (Sierra Leone, Liberia) - Sapo-Tai Forest Complex: Transboundary Conservation Area for Environmental Cooperation and Sustainable Development (Côte d'Ivoire, Liberia) - Development of a trans-frontier conservation area linking forest reserves and protected areas in Ghana and Côte d'Ivoire
		Sustainable agriculture and land management guidelines/certification	- Community-based Management of On-farm Plant Genetic Resources in Arid and Semi-Arid Areas of Sub-Saharan Africa - West Africa Fair Fruit (NGO providing support for smallholder and company capacity building, RSPO certification) - Unilever/Solidaridadsustainability initiative in West Africa (including hotspot subregions) - RSPO certified plantations include the Siat GroupandBenso OilPalmPlantation inGhana.Upper East Region Land Conservation and Smallholder Rehabilitation Project (LACOSREP) (Ghana) - Chinese Government issued voluntary guidelines for overseas investment (plantations); FAO plantation guidelines
Impacts from mining, oil and gas	International Oil producers - Shell, Total, Addax petroleum, ExxonMobil and Chevron Gold mining companies (Ghana) - Gold Fields	Transparency and reporting initiatives	- Liberia (EITI-compliant countries also include Cameroon, Côte d'Ivoire, Ghana, Nigeria and Togo) - Publish What You Pay (affiliated coalitions in most countries in hotspot)

Threats/drivers	Examples of key actors	Approaches for mitigation	Current/previous examples of approaches
	Limited, AngloGold Ashanti Ltd. And Golden Star Resources Ltd. Affected communities and CSOs working in sector Government agencies responsible for mining, oil and gas policy, planning and approvals	Sustainability certification	- Property Rights and Artisanal Diamond Development (PRADD) project
		Ecosystem restoration	- Mangrove restoration in The Gulf of Guinea Large Marine Ecosystem project funded by Global Environmental Facility (GEF) - Mangroves for the Future (MFF) (Sierra Leone) - Sustainable Livelihoods and Biodiversity Project to sustain and restore wetlands in the Niger Delta
		Private sector partnerships / offsets	- Niger Delta Shell-Wetlands International wetlands programme (Nigeria) - AML/East Nimba Nature Reserve and Biodiversity Conservation Programme (Liberia)
Hydropower Unsustainable water resource management	Hydropower projects/developers - Bui Hydropower Project (Ghana) - AkosomboDam (Lake Volta (Ghana) - The Nangbéto Hydroelectric Dam (Togo) - Mabilla Hydropower project (Nigeria) Affected communities, CSOs working in the sector Government agencies responsible for hydropower/water reosurcesplanning and approvals Regional organisations: ECOWAS Permanent Forum for the Coordination and Monitoring of the Integrated Management of Water Resources in West Africa; river basin authorities	Integrated water resources management/ catchment management	- River Basin Committees (e.g. Volta Basin Authority, Lake Chad Basin Commission) - Senegal River Basin Water and Environmental Management Program - Reversing Land and Water Degradation Trends in the Niger River Basin
		Resource efficiency/sustainable consumption and production	- Hydropower Sustainability Assessment Protocol (Ghana)
		Infrastructure development standards /safeguards	- ECOWAS draft guideline on water infrastructure - Safeguard policies for infrastructure development/investment projects (eg IFC, World Bank, national ESIA requirements)
Economic corridors and infrastructure development	Infrastructure development companies Investors and loan provides, e.g. World Bank, African Development Bank, China Exim Bank Infrastructure promotion programs, e.g. PIDA Government agencies	Infrastructure development standards /safeguards	- Safeguard policies for infrastructure development/investment projects (eg IFC, World Bank, national ESIA requirements) - Chinese Government issued voluntary guidelines for overseas investment (general)

Threats/drivers	Examples of key actors	Approaches for mitigation	Current/previous examples of approaches
	responsible for infrastructure development, investments, approvals (including EIAs)		
Residential and commercial development - Coastal development - Urban/industrial expansion - Waste/pollution	Developers of coastal tourism; resorts Sand and gravel miners (for building materials) Rural-urban migrants Land-use/town planners Commercial developers	Integrated land-use planning / coastal zone management	There are no Integrated Coastal Zone Management Initiatives in a formal sense in the hotspot. However, there are several regional and international organizations that are working to build collaborative and interdisciplinary marine resource management in the region: - The FAO in terms of fishing areas/data collection (CECAF is the West Africa region corresponding to FAO Fishing area 34). - The Regional Coastal and Marine Conservation Programme for West Africa (PRCM) which is a regional political/economic management body for West African coastal areas. - The UNDP project "Adaptation to climate change: responding to shoreline change and its human dimensions in West Africa through integrated coastal area management"
		Sustainable consumption and production	- West and Central Africa Subregional Workshop on Better Air Quality (BAQ), held on 20 -21 July (Policy Session) and 22 July 2009 (Ministerial Session) in Abidjan, Côte d'Ivoire.
		Mangrove protection, restoration and afforestation	- Mangrove in West Africa Initiative (Guinea, Sierra Leone) - Building Mangrove Resilience to Climate Change – Douala-Edea, Ntem, and Rio del Rey Estuaries (Cameroon)
		Waste treatment/disposal	- The 'Integrated waste management in western Africa' (IWWA) project (Ghana, CôteD'ivoire, Nigeria)
Climate change	- Climate change offices/agencies (e.g. in charge of adaptation and mitigation planning) - Land-use/town planners - REDD+/CDM project developers - Transport and energy sector	Renewable energy/energy efficiency /CDM	- SANIA fuel switching from natural gas to renewable biomass project (CDM, Côte d'Ivoire) - Efficient Fuel Wood Stoves for Nigeria (CDM)
		REDD+/ forest carbon related/reforestation and afforestation	- Gola Rainforest REDD+ project (Sierra Leone) - Nigeria/Cross River State REDD+ initiative (Nigeria Readiness Programme) - Greenpeace-TFT-Golden Agri-Resources Ltd collaboration on methodology to identify High Carbon Stock forest (Indonesia) - National Council on

Threats/drivers	Examples of key actors	Approaches for mitigation	Current/previous examples of approaches
			Shelterbelt and Afforestation/national afforestation programme (Nigeria)
		Adaptation/resilience	- Adaptation to climate change in vulnerable coastal communities (SãoToméand Príncipe) - Building Mangrove Resilience to Climate Change – Douala-Edea, Ntem, and Rio del Rey Estuaries (Cameroon) - Protected Areas Resilient to Climate Change (PARCC) in West Africa (PARCC) (regional)
Invasive and other problematic species and genes, and diseases	- Agriculture and fisheries agencies - Vetinary/health agencies and research institutes - Forecasting initiatives for disease	Removal of invasive species	- Ministry in charge of Environment project to manage the water hyacinth and other invasive species (Cameroon) - Biological control of water hyacinth (Benin)
		Disease prevention	- Ebola vaccine trial for wild chimpanzee conservation- New Iberia Research Center

Appendix 10: Additional Details on Climate-change-related Projects in the Hotspot

Active Climate Change Mitigation Projects in the Hotspot Countries

Country	REDD+ Programmes	Clean Development Mechanism (CDM) projects
Benin	**UN-REDD**: Partner country since 2011. **FCPF**: None **Other:** None	None active; project idea listed on CDM Bazaar.
Cameroon	**UN-REDD**: Partner country since 2011; National REDD Steering Committee established; Regional GEF-REDD programme supporting communications strategy. **FCPF**: Readiness Preparation Proposal (RPP) to FCPF in 2012, finalised early 2013. Grant agreement in Nov. 2013 to support development of National REDD+ Strategy. **Other**: • REDD Desk notes ca. 20 REDD+ initiatives by a variety of actors, incl. COMIFAC, WWF, WCS. • Voluntary REDD+ Database (VRD) notes 28 arrangements and flows of $10.67m.	Two landfill gas projects registered.
Cote d'Ivoire	**UN-REDD**: Partner country since 2011. Receiving support for the preparation of a National REDD+ Strategy. **FCPF**: Requested support in 2012. Recently accepted as partner country. **Other**: • VRD notes 13 REDD+ arrangements, $4.73m in flows. • UK Forest Governance, Markets and Climate Programme (FGMC) also active.	Five registered projects including/: • 1 x landfill gas recovery and flaring, • 1 x fuel switch, • 1 x waste-to-energy, • 1 x conversion to combined cycle, • 1 x biomass-to-energy.
Equatorial Guinea	**UN-REDD:** Selected as a participant country but not agreed. **FCPF**: Submitted R-PIN in 2008. Not a partner/candidate country. **Other**: None	
Ghana	**UN-REDD**: Partner country since 2011. National REDD+ Secretariat established. **FCPF**: R-PIN approved in July 2008 R-PP signed in August 2009. Readiness Grant in 2011, with launch of Ghana's REDD+ Readiness programme in 2012. National REDD+ Strategy under development. **Other:** • VRD notes 16 REDD+ arrangements, $54.4m in flows. • Japanese Funded Forest Preservation Programme (FPP) Technology Transfer and Support for trend analysis of forest land change, forest resource map, biomass and C-Stock estimation and Capacity building ($7.8m). • IUCN private investment in restoration to advance REDD+ • UK Forest Governance, Markets and Climate Programme (FGMC).	Two registered projects: • 1 x landfill gas utilization, • 1 x municipal waste composting.
Guinea	**UN-REDD**: None **FCPF**: None **Other**: None	
Liberia	**UN-REDD**: None **FCPF**: R-PP approved in March 2012 and preparation grant signed in June 2012 to prepare elements of a National REDD+ Strategy ($0,2m). **Other**: • RRI Tenure and Governance Reform for REDD+ project UK FG • Bilateral agreement with Norway (NOK 1 billion), Sept. 2014.	

Country	REDD+ Programmes	Clean Development Mechanism (CDM) projects
Nigeria	**UN-REDD:** Partner country since 2010, with a National Programme, with focus on Cross River State. $4m approved for NP in 2011 for 2012-2014. Here pilot sites identified in CRS (Ekuri-Iko Esai-Okokori-Etara Eyeyeng-Owai Ukpon River Forest Reserve Mbe mountain-Afi River Project; new mangrove forest reserve. **FCPF**: Submitted interest to join in 2009. Recently accepted as partner country. **Other**: • VRD lists 6 arrangements with $3m in national funding. • GCF support network for REDD+ project. • Other oganisations involved in pilot sites include NCRC/Katoomba Group, WCS	10 registered projects including: • 1 x gas utilisation, • 3 x gas recovery, • 1 x fuel substitution, • 1 x hydropower rehabilitation, • 1 x municipal waste composting, • 1 x landfill gas, • 1 x efficient fuelwood stoves, • 1 x combined cycle.
São Tomé and Príncipe	**UN-REDD**: None **FCPF**: None **Other**: VRD notes 3 REDD arrangements with $0.11m in flows.	Several CDM capacity building activities for CDM, for e.g.: • ACP-CD4CDM Project, • EC Programme for Capacity Building for MEAs in African, Caribbean and Pacific countries. • CDM hydropower project submitted for initial consideration in Aug 2012.
Sierra Leone	**UN-REDD**: None **FCPF**: In 2011 a private company presented Govt. of Sierra Leone with a FCPF R-PP proposing licensing agreement for c. 488,000 ha to the company; no consultation was conducted and later revealed as a carbon scam. National process has since been revived with support from EC. **Other**: • 'Gola Rainforest REDD+ project' being implemented by RSPB, MAFFS and the Conservation Society of Sierra Leone (CSSL), currently seeking CCB and VCS validation • Bumbuna Hydroelectric Environmental and Social Management Project developing REDD+ feasibility studies • Western Area Peninsula National Park developing a PDD for VCS. • GCCA 'REDD+ Capacity Building in Sierra Leone' project.	1 registered project: Makeni power project; Also first sugarcane-based power project for ethanol production to be registered in Africa.
Togo	**UN-REDD**: None **FCPF**: R-PP revised in Nov 2013 and June 2014, after expression of interest in joining in Jan 2013. **Other**: ITTO support on REDD+	

Notes: ACP: African, Caribbean and Pacific countries; CCB: Climate, Community and Biodiversity Standards; CRS: Cross River State (Nigeria); COMIFAC: Central African Forest Commission (Commission des Forêts d'Afrique Centrale) ; EC: European Commission; GCCA: Global Climate Change Alliance; ITTO: International Tropical Timber Organisation; MEA: Multilateral Environmental Agreement; NCRC: Nature Conservation Research Centre; NP: National Programme; PDD: Project Design Document; R-PIN: Readiness Project Idea Note; R-PP: Readiness Preparation Proposal; RRI: Rights and Resources Initiative; RSPB: Royal Society for Protection of Birds; VCS: Verified Carbon Standard; VRD: Voluntary REDD Database; WCS: Wildlife Conservation Society.

Active Climate Change Adaptation Projects in the Hotspot Countries

Country	Examples of Climate Change Adaptation Projects in the Hotspot
Benin	• Emergency Urban Environment Project, DRR and floods in Cotonou Agglomeration, 2011-2015; • Lagoon ecosystems project in AF pipeline. • GCCA: DRR through gallery forest conservation. • Flood control and agricultural infrastructure resilience in Oueme Valley (AfDB, $7.2m)
Cameroon	• Flood Emergency Project in north Cameroon, 2013-2017 (World Bank, $108m).
Ghana	• Sustainable Land and Water Management Project, under Green Wall/SAWAP, 2010-2016 (GEF, $8.5m). • LEDS/Climate Compatible Development project, CDKN, 2011-2012. • Request to AF for funding for increasing resilience in Northern Ghana.
Guinea	• CCLME mangroves project. • World Bank/GEF projects Senegal River Basin Multi-Purpose Water Resources Development Project 2 and the Senegal River Basin Climate Change Resilience Development Project: include IWRM as well as water resources development, management of dams in context of improving climate resilience.
Nigeria	• Erosion and Watershed Management Project (under SAWAP/Green Wall), 2012-2020 (GEF)
São Tomé and Príncipe	• Increase the adaptive capacity of vulnerable coastal communities, 2011-2016 (GEF). • GCCA support for reducing vulnerability. • UNDP/GEF project to promote sustainable and climate-resilient grid-based hydroelectric electricity in São Tomé and Príncipe • World Bank/GEF São Tomé - Adaptation to Climate Change project, which includes an early warning system, coastal protection works, and CBA-EBA measures
Sierra Leone	• National Sea-Level Observing System has been established. • Climate change resilience in WATSAN sector (AfDB, $4m) • PARCC participating country • CCLME mangroves project.
Togo	• Integrated Disaster and Land Management Project (under SAWAP/Green Wall), 2013-2016 (GEF, $17.3m?); • PARCC participating country

Notes: AfDB African Development Bank; CBACommunity-based adaptation; CDKNClimate and Development Knowledge Network; DRRDisaster risk reduction; EBAEcosystem-based adaptation; GEFGlobal Environment Facility; GCCAGlobal Climate Change Alliance; IWRMIntegrated Water Resources Management; LEDSLow-emission Development Strategy; PARCC Protected Areas Resilient to Climate Change; SAWAP Sahel and West Africa Program; UNDP United Nations Development Programme; WATSAN Water and Sanitation

Examples of Local and Regional Civil Society Organizations Operating in the Hotspot

Level	Key actors	Description	Links to biodiversity	Link/ref	Language
Ghana	**Hatof Foundation**	Promotes Biodiversity Conservation and Integrated Coastal Zone Management-ICZM, climate change (policy, legal, mitigation and adaptation activities), sustainable land management, and technology based solutions to problems facing local communities in Ghana. Established in 1999. Accreditation from the United Nations Framework Convention on Climate (for what?); currently the Focal Point for West Africa Global Environment Facility (GEF) NGO Network and is the host secretariat for Climate Action Network (CAN) Ghana. "The approach is to develop projects with community groups – especially the youth and women – to meet their development challenges, and to enhance community-based adaptation to climate change and other environmental issues" (Project Coordinator). Hatof is engaged in restoring some mangrove areas along the coast, encouraging the use of renewable energy, planting of sunflower crops for use in bio fuel production, tree-planting initiatives, and collaborating with government agencies and other NGOs.	Yes; works on biodiversity conservation.	http://www.hatof.org/	Ang
Ghana	**Green Earth Organization (GEO)**	Began in 1989. The mission of the organization is to ensure the conservation, preservation, protection and restoration of natural resources on earth. Engaged in issues associated with forests, biodiversity, CC, water resources, women's empowerment, etc. It has been instrumental in the formation of over 175 Green Earth Clubs in primary secondary and tertiary institutions in Ghana.	Works in biodiversity relevant themes/areas.	http://www.greenactorswestafrica.org/organisations/geo/	Ang
Nigeria	**All Farmers Association of Nigeria (AFAN)**	National Platform for farmers in Nigeria; network of affiliates based on commodity associations. Mission: "To enhance the skills of farmers and other related stakeholders through modern technology and agribusiness approach focused on wealth and job creation." Considered a potential platform/channel for engaging farmers in CC activities.	Limited.	http://allfarmersassociationofnig.gnbo.com.ng/ http://afanplaza.com/	Ang
Nigeria	**Nigerian Conservation Foundation (NCF)**	Mission to preserve the full range of Nigeria's biodiversity which includes species, ecosystems and genetic biodiversity; promote the sustainable use of natural resources for the benefit of present and future generations; and advocate actions that minimise pollution and wasteful utilisation of renewable resources. Member of IUCN and working with major international environmental NGOs e.g. WWF, Birdlife, etc. Numerous biodiversity/forest projects, with field offices. Has a CC programme, with a CC strategy (2009); plans to engage in awareness raising, mitigation, adaptation, climate finance, policy advocacy. NCF has had input in fora to develop the REDD strategy for Nigeria. No current CC projects but active in Cross River State	Yes; works on biodiversity conservation.	http://ncfnigeria.org/	Ang

Level	Key actors	Description	Links to biodiversity	Link/ref	Language
Nigeria	**Pro-Natura International (PNI)**	PNI has experience in implementing projects on sustainable community development with environmental protection particularly in various locations in the Niger Delta. They are developing a REDD pilot project for a new protected area in Ogun, Ondo and Osun States. PNI and NCF began working with the state governments on a project to establish a new protected area consisting of the remaining 40% of natural forest (about 100,000 ha) found in the reserves. The project hopes to establish a REDD pilot to market the carbon credits from the regenerating forests in order to provide sustainable finance for the protection of these forests and the livelihoods of the people that depend on them in perpetuity.	Works in biodiversity relevant themes/areas.	Nigeria REDD Assessment, 2010; http://www.fundsforngos.org/all-listings/pro-natura-international-nigeria/	Ang
Nigeria	**NigeriaCAN (Climate Action Network)**	A coalition (public and private sectors, CSOs, international development organisations and individuals in Nigeria working to promote government and individual actions to combat climate change. Members work to achieve this goal through the coordination of information exchange and civil society strategy on national and international issues. Coalition's activities are organised around three focus groups: a) Climate Change Policy and Institutional Change Group, b) Climate Change Information Access Group and c) Climate Change International Participation Group. NigeriaCAN seeks to create arenas where stakeholders in civil society can engage with private sector and decision-makers at both National Assembly and the Executive around the process of climate change institution-building.	Limited; focus is on CC.	http://nigeriacan.org/web/index.php	Ang
Liberia	**Action Against Climate Change (AACC)**	Established in 2009, aims "To protect our environment, natural resources management and benefit sharing given its flagrant abuse by many, and the damaging effects on the future of our people thereby helping to forestall the country's propelling climate change, miss-management of the natural resources and environmental degradation." Strong media use, with radio shows, TV, blog, Facebook page etc., school awareness programs.	~	http://aaccliberia.blogspot.co.uk/	Ang
Nigeria	**African Radio Drama Association**	Climate Change Adaptation in Northern Nigeria - collaborative project, headed by ARDA, aims to improve the capacity of smallholder farmers in Northern Nigeria to the effects of climate change. With sponsorship from IDRC Canada, and ARDA's joint organization with Farm Radio International (FRI), Women Farmers Action Network (WOFAN), and the University of Guelph, a 26 episode radio drama will air in 5 provinces in Northern Nigeria.	~	Nigeria REDD Assessment, 2010	Ang

Level	Key actors	Description	Links to biodiversity	Link/ref	Language
Togo	**Les Compagnons Ruraux**	NGO de conservation de la biodiversité, de lutte contre la désertification et de promotion du Tourisme Durable; Contribuer à la pérennisation des programmes de conservation de la biodiversité et de lutte contre la désertification des Associations de protection de l'environnement; Œuvrer pour une meilleure prise en compte des problèmes de désertification au Togo.	Works in biodiversity relevant themes/areas.	http://www.greenactorswestafrica.org/organisations/les-compagnons-ruraux/; http://www.lcr.tg/index.shtml	Fr
Regional/ Nigeria	**International Centre for Energy, Environment and Development (ICEED)**	Provider of expertise in energy access policy reform, renewable energy technical assistance and climate change and clean energy financing. ICEED provides policy research, policy development support, programme design, project management, capacity building, monitoring and evaluation and advocacy to a wide range of Nigerian and international organisations. Involved in energy efficient wood stoves project; has CC programme with no. of activities, including work on CDM, building of the Nigeria Climate Action Network coalition, development of CC related agricultural insurance scheme, developing indicators for measuring energy sector vulnerability to climate change, providing policy advice.	Indirect. E.g. wood stoves project.	http://www.iceednigeria.org/	Ang
Regional	**AGRHYMET**	Interstate public institute with a legal status and financial autonomy, based in Niamey, Niger. UGF members: Benin, Cote d'Ivoire, Guinea, Togo. Its main objectives are contribution to achieving food security and increased agricultural production in the CILSS member States and improvement of NRM in the Sahelian region. Involved in several CC projects, e.g. disseminating agro-meteorological information to reduce vulnerability to current climate variability; provide seasonal forecasts and information on current climate variability to farmers.	Limited. Biodiversity not part of mission/goals/activities, but data may be relevant.	http://www.agrhymet.ne/	Ang/Fr
Regional	**Green Actors of West Africa (GAWA)**	Group of environmental organisations across the region with a goal to develop ways of enhancing cooperation and coordination between and among the various donors and environmental actors in the subregion. Covers UGF countries: Benin, Cote d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone, Togo. Core issues: 1.Forests; 2.Marine and Coastal Resources; 3.Mining; 4.Renewable Energy; 5.Waste Management / Pollution; 6.Water Resources and River Basins.	Works in biodiversity relevant themes/areas.	http://www.greenactorswestafrica.org/	Ang/Fr
Regional	**L'Observatoire du Sahara et du Sahel (OSS)**	Based in Tunisia; to improve early warning and monitoring systems for agriculture, food security and drought in Africa, covering arid, semi-arid and subhumid areas of the Sahara and Sahel. Early warning and monitoring systems for agriculture, food security and drought. Provides member countries and organisations with a forum where they can share experiences and harmonise the ways in which data is collected and processed to feed into decision support tools. Initiator and facilitator of partnerships around common challenges related to shared water resources and implementation of MEAS, including those on desertification, biodiversity and climate change climate. UGF members: Cote d'Ivoire.	Limited. Biodiversity not part of mission/goals/activities, but data may be relevant. Limited coverage of UGF region.	http://www.oss-online.org/	Fr

Level	Key actors	Description	Links to biodiversity	Link/ref	Language
Regional	**Volta Basin Authority**	The 1st Assembly of the Heads of State of the riparian countries of the Volta Basin held on 19 January 2007, signed a Convention for the establishment of the Volta Basin Authority (VBA). Member states: Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Togo. The mandate of the VBA is to: Promote permanent consultation tools among the parties for the development of the basin; Promote the implementation of integrated water resources management and the equitable distribution of the benefits resulting from their various utilizations; Authorize the development of infrastructure and projects planned by the stakeholders and which could have substantial impact on the water resources of the basin; Develop joint projects and works; Contribute to poverty alleviation, the sustainable development of the Parties in the Volta basin, and for better socioeconomic integration in the subregion. Has range of IWRM/sustainable development projects, including an arm of Challenge Program on Water and Food (CPWF), plus observatory.	Not explicit, but relevant; access to data on river basin?	http://www.abv-volta.org:10000/abv2/	Ang/Fr
Regional	**IPACC - Indigenous Peoples of Africa Coordinating Committee**	Network of 150 indigenous peoples organisations in 20 African countries. IPACC is accredited with the UN Economic and Social Council, the UN Environment Programme, the Global Environment Facility, UNESCO and the African Commission on Human and Peoples' Rights. It has regional representatives; for West Africa (2012-2014): Sada ALBACHIR, Tuareg, Niger. Carries out training and awareness raising on CC and adaptation, and is active at UN conferences, e.g. facilitated global indigenous dialogue on climate adaptation at COP18	Indirect, eg participation in forums, events, statements on international policy.	http://www.ipacc.org.za/eng/default.asp	All
Regional	**NGO Climate and Development Network**	Made up of 70 NGOs from Francophone countries in Europe and Africa, including some from UGF countries: Benin, Cameroon, Cote d'Ivoire, Guinea, Togo. Conducts advocacy, awareness, capacity building for NGOs from South and North on issues related to negotiations within UNFCCC, integration of CC into development plans.	Some; works mainly on CC but links to other conventions support.	http://ressourcesclimatdeveloppement.jimdo.com/	Ang/Fr

Appendix 11: Medium- and Full-sized GEF Projects within the Hotspot

Country	Project/Programme Title	Location	Total Project Cost (USD)	Total GEF Grant (USD)	Additional Donor(s)	Start Date	End Date
Benin	SPWA - Incorporation of Sacred Forests into the Protected Areas System of Benin		6,500,000	5,380,000	UNDP; Local governments	2010	2014
Benin	Forests and Adjacent Lands Management Project		6,000,000	6,000,000	World Bank /International Development Association	2011	2013
Benin	AF-Forest and Adjacent Land MGMT (PSG)		3,560,000	3,560,000	World Bank /International Development Association	2013	2016
Benin	Community-Based Coastal and Marine Biodiversity Management Project	Coastal and Marine Area	4,300,000	4,300,000	World Bank /International Development Association	2011	2014
Benin	Support to the Protected Areas Management Project		2,300,000	1,900,000	World Bank /International Development Association; German government (KFW)	2011	2016
Cameroon	Cameroon Forest and Environment Sector Program (FESP)		10,000,000	10,000,000		2006	2011
Cameroon	Sustainable Agro-Pastoral and Land Management Promotion under the PNDP		6,000,000	6,000,000		2006	2012
Côte d’Ivoire	Ivory Coast Protected Area Project	Comoe National Park	2,540,000	2,540,000		2009	2014
Côte d’Ivoire	Protected Areas Management Project (PCGAP)	Various PAs	12,340,596	11,624,000	G; German government(KFW/GTZ); EU; UNESCO; NGOs	2009	2012
Equatorial Guinea	CBSP - Sustainable forest management in Equatorial Guinea for the conservation of representative ecosystems and globally significant biodiversity	Three pilot sites (2 at Rio Muni and 1 in Bioko Island)	7,195,000	4,745,000	UNDP; EU; Conservation International; G	2010	2013

Country	Project/Programme Title	Location	Total Project Cost (USD)	Total GEF Grant (USD)	Additional Donor(s)	Start Date	End Date
Ghana	Ghana - West Africa Regional Fisheries Program	Coastal and marine	3,500,000	3,500,000	World Bank /International Development Association	2011	2017
Guinea	Community-Based Land Management Project	(selected subcatchments)	14,500,000	9,500,000	International Fund for Agricultural Development; LC; World Bank /International Development Association; G	2006	2014
Guinea	Coastal Marine and Biodiversity Management	Guinean coastal priority sites	11,830,000	6,630,000	International Fund for Agricultural Development , OTH; LC; International Development Association; G	2006	2013
Liberia	Expansion of Protected Areas Network - II	Nation-wide	2,000,000	1,000,000	G	2011	2015
Liberia	Establishment of Protected Areas Network		7,280,000	750,000	GEF+WBFP; NGO/B	2008	2012
Nigeria	SPWA-Niger Delta Biodiversity Project	Niger Delta	4,610,000	4,610,000	UNDP/TRAC	2011	2015
Nigeria	Nigeria Erosion and Watershed Management Project		8,592,593	8,590,000	World Bank /International Development Association	2012	2020
Sierra Leone	Wetlands Conservation Project	Wetland areas in Sierra Leone	1,800,000	1,800,000		2011	2015
Sierra Leone	SL-GEF Biodiversity Conservation Project	Selected priority biodiversity conservation sites (CSs)	21,800,000	20,800,000	International Development Association; B; Foreign M; G	2010	2015

Country	Project/Programme Title	Location	Total Project Cost (USD)	Total GEF Grant (USD)	Additional Donor(s)	Start Date	End Date
São Tomé and Príncipe	São Tomé - Adaptation to Climate Change	les districts de Caué, Cantagalo, Me-Zochi, Lemba, Lobata et la Région Autonome de Príncipe	4,150,000	4,150,000		2013	2018
Togo	Renforcement de capacités pour la gestion de l'environnement (PRCGE)	Nationwide	1,000,000	1,000,000	World Band; Europenan Commission	2010	2013
Togo	SPWA - Strengthening the conservation role of Togo's national System of Protected Areas (PA)		4,369,727	1,272,727	UEMOA; UNDP/TRAC; G	2011	2015
Regional	Evolution of PA Systems with Regard to Climate Change ing West Africa Region (under SPWA-BD Programme)	Sierra Leone and Togo (within hotspot)	13,636,364	3,636,364			
Regional	Integrated Development for Increased Rural Climate Resilience in the Niger Basin	Benin, Cameroon, Côte d'Ivoire, Guinea, Nigeria (within hotspot)	73,014,800	12,014,800			

Note: Only projects that can be linked to biodiversity conservation within the hotspot have been included.

Appendix 12: Expected Contributions of the CEPF Investment Portfolio in the Hotspot to the Sustainable Development Goals and the Aichi Targets

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
Objective Engage civil society in the conservation of globally threatened biodiversity through targeted investments with maximum impact on the highest conservation priorities.	At least 60 local communities are empowered to engage in the sustainable management of priority sites and/or consolidate ecological connectivity at the landscape scale.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels
	At least 20 Key Biodiversity Areas targeted by CEPF grants have new or strengthened protection and management.	**Goal 15** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	**Target 11** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes
	At least 100,000 hectares within production landscapes are managed for biodiversity conservation or sustainable use.	**Goal 12** Ensure sustainable consumption and production patterns	**Target 7** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
	Public policies and/or private sector business practices in at least 6 conservation corridors incorporate provisions for biodiversity conservation.	**Goal 12** Ensure sustainable consumption and production patterns	**Target 3** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions
	Populations of at least 30 globally threatened species targeted by CEPF grants are stable or increasing.	**Goal 15** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	**Target 12** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained
	At least 15 networks are formed among civil society, government and private sector actors to facilitate capacity building, avoid duplication of effort and maximize impact.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
	At least 50 civil society organizations, including at least 10 Indigenous People's, women's and/or youth groups, demonstrate improvements in organizational capacity.	**Goal 5** Achieve gender equality and empower all women and girls **Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels
	Investment strategies of at least 2 other donors active in the Guinean Forests incorporate geographic and/or thematic priorities from the ecosystem profile.	**Goal 17** Revitalize the global partnership for sustainable development	**Target 20** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
Outcome 1 Local communities are empowered to engage in sustainable management of 40 priority sites and consolidate ecological connectivity at the landscape scale.	At least 15 local land-use plans elaborated and implemented to facilitate good governance in the management of community and private reserves and concessions.	**Goal 2** End hunger, achieve food security and improved nutrition and promote sustainable agriculture	**Target 14** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable
	At least 10 local and indigenous communities are trained to initiate and advocate for land tenure and forestry reforms in relation to management of community and private reserves and concessions.	**Goal 4** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	**Target 5** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced
	At least 10 participatory management plans that support stakeholder collaboration in Protected Area management are prepared and implemented.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 11** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes
	At least 30 local communities targeted by sustainable livelihood/job creation activities or benefit-sharing mechanisms show tangible wellbeing benefits.	**Goal 1** End poverty in all its forms everywhere **Goal 8** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	**Target 16** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
Outcome 2 Biodiversity conservation mainstreamed into public policy and private sector practice in the nine conservation corridors, at local, sub-national and national levels.	At least 5 conservation-related policies of national governments are informed or influenced by research, analysis and outreach supported by CEPF grants.	**Goal 9** Build resilient infrastructure, promote sustainable industrialization and foster innovation **Goal 13** Take urgent action to combat climate change and its impacts	**Target 3** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions
	Locally-relevant information on natural ecosystems is generated for at least 20 key biodiversity areas and used to influence political and economic decision-making in favor of their conservation	**Goal 15** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	**Target 2** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems
	At least 20 partnerships are formed or strengthened among civil society, government, private sector and communities to promote best practices in mining, sustainable forestry and agriculture by private companies.	**Goal 12** Ensure sustainable consumption and production patterns **Goal 17** Revitalize the global partnership for sustainable development	**Target 4** By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits
	At least 5 private companies adopt new management practices consistent with biodiversity conservation at operations in the conservation corridors.	**Goal 9** Build resilient infrastructure, promote sustainable industrialization and foster innovation **Goal 12** Ensure sustainable consumption and production patterns	**Target 7** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
Outcome 3 Priority globally threatened species are safeguarded by identifying and addressing major threats and information gaps.	Priority actions identified in Conservation Action Plans are implemented for at least 15 Critically Endangered and Endangered species.	**Goal 15** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	**Target 12** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained
	The inventory of Key Biodiversity Areas in the hotspot is updated to fill critical information gaps, particularly with regard to the Lower Guinean Forests subregion, and freshwater ecosystems.	**Goal 15** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	**Target 19** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied
	The global conservation status of at least 100 species from poorly assessed taxonomic groups is updated or assessed for the first time on the IUCN Red List.	**Goal 15** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	**Target 19** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
Outcome 4 Capacity of local civil society organizations, including Indigenous People's, women's and youth groups built to conserve and manage globally important biodiversity.	At least 50 local civil society organizations, including at least 10 Indigenous People's organizations, demonstrate strengthened capacity with regard to financial, institutional and project management, organizational governance, and fundraising.	**Goal 4** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all **Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels
	At least 20 women-led conservation and development organizations, associations and networks are established and strengthened to foster gender equality in natural resource management and benefit sharing.	**Goal 5** Achieve gender equality and empower all women and girls **Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels
	At least 20 local civil society organizations demonstrate increased communication capacity in ways that support the delivery of their mission.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 1** By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
Outcome 5 A Regional Implementation Team provides strategic leadership and effective coordination of CEPF conservation investment in the Guinean Forests Hotspot.	At least 60 civil society organizations, including at least 30 local and indigenous NGOs actively participate in conservation actions guided by the ecosystems profile.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
	At least 85 percent of local NGOs receiving grants demonstrate more effective capacity to design and implement conservation actions.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels
	At least 5 civil society organizations supported by CEPF secure follow-up funding to promote the sustainability of their CEPF grants.	**Goal 16** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	**Target 18** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels

Objective / Outcome	Targets / Indicators	Relevant Sustainable Development Goals	Relevant Aichi Targets
	At least $1 million in additional funding is leveraged from other donors towards the priorities set in the ecosystem profile.	**Goal 17** Revitalize the global partnership for sustainable development	**Target 20** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties
	At least 2 participatory assessments are undertaken and documented.		