CRITICAL ECOSYSTEM PARTNERSHIP FUND

Ecosystem Profile

UPPER GUINEAN FOREST ECOSYSTEM
Of the
GUINEAN FORESTS OF WEST AFRICA
BIODIVERSITY HOTSPOT

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INTRODUCTION

The Critical Ecosystem Partnership Fund (CEPF) is designed to better safeguard the world's threatened biological hotspots in developing countries. It is a joint initiative of Conservation International (CI), the Global Environment Facility (GEF), the Government of Japan, the MacArthur Foundation and the World Bank. CEPF provides financing to projects located in biodiversity hotspots — highly threatened regions representing only 1.4 percent of the planet's land surface, where some 60 percent of all terrestrial species diversity is found.

CEPF has been designed to build on the World Bank's commitment to biodiversity conservation and sustainable management, primarily implemented through the GEF and channeled to governments. CEPF will complement the efforts of the World Bank and the GEF to conserve biodiversity conservation by providing a streamlined funding mechanism to a broad range of civil society partners, including NGOs, community groups and private sector partners.

CEPF will further the overall goals of the Bank at the country level by offering an opportunity to engage local communities and other stakeholders in biodiversity conservation and ecosystem management. CEPF will also provide an important learning experience through an innovative online grant system at www.cepf.net and by focusing on on-the-ground results and experience. The site is designed to serve as a central node, disseminating lessons learned and facilitating cross-regional information exchange on conservation successes. It will also promote replication of successful projects by providing access to a wide range of resources designed to aid project implementers in the biodiversity hotspots.

CEPF will strive to use lessons from other programs, particularly the GEF's medium grants procedure, to ensure that funds are provided expeditiously and with appropriate, cost-effective levels of accountability. CEPF will also use the GEF national focal points to ensure client country endorsement of the strategic direction of CEPF. CEPF is intended to complement, rather than duplicate or overlap with, regular GEF activities.

CEPF will support strategic working alliances among community groups, NGOs, government, academia and the private sector, combining unique capacities and eliminating duplication of efforts for a more comprehensive approach to conservation challenges. CEPF is unique among other funding mechanisms in that it focuses specifically on biological areas rather than political boundaries and will look at conservation threats on a corridor-wide basis for maximum return on investment. In the case of West Africa, the majority of previous funding has been country-specific, making CEPF one of the early transboundary mechanisms used in the region. The strategic directions of the CEPF program are based on a priority-setting process that has taken place in the region, and target funding gaps in the larger regional strategy. Building on the collaborative processes already underway in the region will allow cooperation in an area rich in biological value yet straddling several national borders. Clearly, a regional approach will be more effective than a national one. In addition, CEPF has taken steps to assess current levels of funding in the region and aims to disburse funds to civil society in a more agile manner, complementing current funding available to government agencies.

Funds will be used to provide small grants to conservation projects managed by private, NGO, and civil society groups working in the critical ecosystems. Funding from CEPF at the project level will leverage additional financial and in-kind contributions. By funding

conservation efforts in production landscapes, such as agricultural areas, CEPF has the potential to build broader-than-usual support for conservation measures, thereby increasing the chances for sustainability.

In summary, CEPF offers an opportunity to promote the conservation of some of the most important ecosystems in the world — places of high biodiversity and great beauty. In addition, the importance of meeting conservation goals is enhanced by the growing recognition of the values provided by healthy, diverse ecosystems in areas such as agriculture, forestry, water supply and fisheries. These issues are critical to the Bank's efforts to alleviate poverty. CEPF will deliver assistance in an agile manner and it will allow the engagement of a wide range of local community groups, civil society organizations, NGOs and private companies in addressing conservation needs.

BACKGROUND: THE GUINEAN FOREST HOTSPOT

The most up-to-date assessment of conservation needs in the Upper Guinea region -including recommendations for priority areas, research opportunities, policy issues, and threats reduction -emerged from a Conservation Priority-Setting Workshop (CPW) held in Elmina, Ghana, in December 1999. The CPW, entitled "From the Forest to the Sea: Biodiversity Connections from Guinea to Togo," convened more than 140 expert conservationists, biologists, government officials, planners, and social scientists from nearly 30 countries. In a five-day consensus-building exercise, the participants combined their knowledge of biological distributions, habitat status, institutional capacities, and socioeconomic trends and opportunities to create a comprehensive picture of conservation in the six-country region comprised by the Upper Guinean Forest Ecosystem.

The resulting CPW outputs, including map, report, and CD-ROM with databases (the latter two to be released by early 2001), offer an investment guide to biodiversity conservation in the region, and suggest paths to conservation success in forest and coastal zones of the Upper Guinea region. The CPW was organized and coordinated by Conservation International, with support from the GEF. The results, however, are based on contributions from participants, and will be distributed to, and used by, multiple parties. The outputs have great potential to enrich ongoing national processes, such as National Biodiversity Conservation Strategies and National Environmental Action Plans, as well as evaluations of conservation effectiveness throughout the region. The CEPF ecosystem profile is largely based on recommendations from the CPW.[1]

With the backdrop of a consensus-driven baseline of priorities, the Ecosystem Profile for the Upper Guinean Forest Ecosystem focuses on a review of known threats to biodiversity conservation and the current level of "investment" that has been mobilized by donors, government agencies and NGOs to combat such threats. The results of this analysis highlight the complementary niche that CEPF seeks to fill in the Upper Guinean Forest Ecosystem. This niche is supported by an investment strategy that seeks to achieve five main funding outputs:

1. strengthened local institutional capacity for conservation;
2. effective processes for coordination and ecosystem monitoring;
3. mechanisms for promotion and implementation of biodiversity corridors;
4. effective collaboration in community outreach, awareness building and education; and

[1] A matrix summarizing the priority areas identified during the CPW is presented in Appendix 1. A list of institutional affiliations of participants appears in Appendix 2.

5. a fast response mechanism to address immediate and unpredicted conservation needs.
The purpose of the investment strategy is to facilitate the effective participation by nongovernmental and other private-sector organizations in the conservation of biodiversity in the Upper Guinean Forest Ecosystem.

To be eligible for funding under this ecosystem profile, a project must not only contribute to one or more of the strategic funding outputs, but must also meet the following general criteria:
1. Project execution must be within World Bank client countries that have ratified or otherwise acceded to the Convention on Biological Diversity. (In the Upper Guinean Forest Ecosystem, projects executed within five countries -Ghana, Côte d'Ivoire, Guinea, Togo and Sierra Leone- would meet these criteria. Liberia's CBD ratification instrument is currently pending with the Secretariat of the Convention on Biological Diversity. Any project directly involving organizations based in Liberia must await the formal acceptance of the country as a Party to the CBD.)
2. Project funding may by no means result in the physical relocation of people, be used for the purchase of land, be directed toward a government entity, or be used for the capitalization of trust funds or similar financial instruments.

BIOLOGICAL IMPORTANCE OF THE GUINEAN FOREST HOTSPOT

The Guinean Forest Hotspot represents the Guinean portion of the Guinea-Congolian forests and contains two main blocks that incorporate several major Pleistocene refugia. The Upper Guinea Forest Ecosystem extends from Guinea into eastern Sierra Leone, and eastward through Liberia, Côte d'Ivoire and Ghana into western Togo. The Lower Guinea Forest Ecosystem extends from western Nigeria to the Sanaga River in southwestern Cameroon and also includes the islands of Bioko and Pagalu, both part of Equatorial Guinea, and São Tomé and Príncipe, which together are an independent nation. The two major ecosystems are separated by the Dahomey Gap, a mixture of savanna and dry forest, in Togo and Benin. (Fig. 1).

The Guinean Forest Hotspot was originally covered in large part by tropical rainforest formations and extended an estimated 1,265,000 square kilometers. However, it has been dramatically reduced to a series of forest fragments separated by agricultural communities and degraded lands. Overall, the region retains approximately 141,000 square kilometers of closed canopy forest cover, or roughly 15% of its original vegetation, and only a little more than 20,000 square kilometers of the land area is found in national parks, nature reserves and wildlife sanctuaries that meet international standards for protection. It is important to note that, compared to the rest of this ecoregion, the Gulf of Guinea islands have higher percentages of their original forest cover intact, due largely to the inaccessibility of steep volcanic slopes that dominate these islands.

In terms of original extent, the Guinean Forest Hotspot ranks fifth among the 25 hotspots identified by Conservation International (the top four are the Mediterranean Basin, Indo-Burma, the Brazilian Cerrado and Sundaland). Its ranking rises to fourth on the world list when only the area still intact is measured. In that category, it trails the Brazilian Cerrado, the Tropical Andes, and Mesoamerica. When one considers the land area currently under official protection, however, the Guinean Forests fall to 12th among the hotspots, suggesting that a great deal of work lies ahead to safeguard this region's biodiversity.

The Coastal Connection

Aquatic systems, freshwater as well as coastal wetlands and near-shore marine communities, are clearly affected by upstream changes in terrestrial -and especially forested- environments. The north-south river systems that flow through the region show the impact of growing human populations, deforestation, expansion of commercial agriculture, and mining. Freshwater aquatic communities are not only heavily harvested -they are also degraded due to poor sanitation, siltation, and pollution. Furthermore, the capacity of rivers to support fisheries and coastal wetland and mangrove habitats is progressively weakened as they flow along their inland courses. Consequently, coastal habitats that are sustained by the ocean-bound freshwater flow are important not only for near-shore artisanal fishing but also for commercial marine fisheries, which are degraded. Marine turtles and manatees, as well as mangroves, wetland communities, and important sites for migratory shorebirds and waterfowl, are still found along the coasts, but receive limited protection. In addition to the challenges created by prevailing land use along watercourses, the conservation of aquatic systems and watersheds is often complicated by their transnational character, reflecting the impact of political fragmentation on the West African landscape.

Fig. 1. "Upper Guinea Forest Ecosystem" within Guinean Forest Biodiversity Hotspot

Levels of Species Diversity, Endemism and Flagship Species for Conservation

Approximately 9,000 species of vascular plants are estimated to occur in the Guinean Forest Hotspot, which ranks it eighth among the hotspots along with the Chocó-Darién/Western Ecuador. Of the plants, 2,250 (25%) are believed to be endemic, suggesting a global ranking of 15th in the number of endemic species (again along with the Chocó-Darién/Western Ecuador), and a ranking below median among hotspots with respect to the percentage of endemics

(Wallacea Hotspot has a 15% rate of plant endemism; the Madagascar and Indian Ocean Islands Hotspot and New Zealand Hotspot have rates of 81%). On average, there are 71 species of vascular plants for every square kilometer of intact natural vegetation in the Guinean Forest Hotspot. This falls in the bottom fifth of the hotspots, the low being 28 species per square kilometer for the Brazilian Cerrado and the high being a remarkable 2,000 species per square kilometer in the Eastern Arc Mountains and Coastal Forests of Kenya and Tanzania. The number of endemic plants per square kilometer, approximately 18, is also on the lower end of the scale with the least being 12 for the Brazilian Cerrado and the greatest being approximately 700, for the Eastern Arc Mountains and Coastal Forests.

Hotspot rankings aside, another global analysis conducted on centers of plant diversity and endemism has identified 14 centers of plant endemism within the Guinean Forest Hotspot: Taï National Park in Côte d'Ivoire, Southeast Forest Remnants in Côte d'Ivoire, Southeast Ghana, Mount Nimba on the Liberia-Guinea-Côte d'Ivoire border, the Cestos-Senkwen River Area in Liberia, Lofa-Mano in Liberia, Sapo National Park in Liberia, the Gola Forests in Sierra Leone, Loma in Sierra Leone, the Cross River National Park in Nigeria, Korup National Park in Cameroon, Mount Cameroon, Príncipe, and São Tomé. These should be considered in the assessment of focal areas for biodiversity conservation within the hotspot.

Levels of faunal diversity and endemism in the Guinean Forests are also impressive. Mammalian diversity, with 551 species, ranks first among the world's 25 hotspots and represents almost half of the 1,150 mammals that are native to continental Africa. Of the Guinean Forests' 551 mammals, 45 (8%) are endemic, a global ranking of 13th in terms of number and a relatively low percentage. At 4.3 mammal species per square kilometer of intact natural vegetation, the Guinean Forest Hotspot ranks an impressive seventh on the world list. However, as suggested by the figures for endemism, the ratio of endemic mammals to remaining intact natural vegetation is also on the lower end of the global scale at 0.3 per square kilometer.

Based on the Guinean Forest's rank as the world's foremost hotspot for mammalian diversity, combined with the relatively high number of species per unit area of intact natural vegetation and the large area of such vegetation that remains unprotected, it is clear that the single highest global priority for mammal conservation must be an increase in the size and number of protected areas within this region. The forest elephant (*Loxodonta africana cyclotis*) and bongo (*Boocerus euryceros*) have emerged as important flagship species for conservation in the Guinean region and beyond, as have Guinean endemics such as the pygmy hippopotamus (*Hexaprotodon liberiensis*), several species of forest duikers (*Cephalophus jentinki, C. maxwelli, C. niger, C. zebra*), and a host of highly endangered primate species and subspecies.

The status of the Guinean Forest primates, in fact, ranks it with the Indo-Burma Hotspot among the two highest-priority regions for primate conservation. According to the 2000 IUCN Red List of Threatened Species, five primates are critically endangered: the white-collared mangabey (*Cercocebus atys lunulatus*), Roloway monkey (*Cercopithecus diana roloway*), Stampfl's putty-nosed guenon (*Cercopithecus nictitans stampflii*), Miss Waldron's red colobus (*Procolobus badius waldroni*), and the Cross River gorilla (*Gorilla gorilla diehli*). Another 21 primates are considered endangered. All but the last two of these threatened primates, or 92%, are endemic to the Guinean Forests Hotspot, and at least one, Miss Waldron's red colobus, has not been sighted in over a quarter of a century and is suspected to be extinct. By far the most

important centers for primate diversity, endemism and threat are the island of Bioko, the Nigeria-Cameroon border, and the forests of southwestern Ghana-southeastern Côte d'Ivoire.

Birds also exhibit significant levels of diversity and endemism in the Guinean Forest Hotspot, with 514 species (14th among the hotspots) and 90 (18%) endemics (10th among the hotspots in number and a significant percentage). The figures for bird diversity (4.1 species per square kilometer) and endemism (0.7 endemic species per square kilometer) per unit area of intact vegetation, while not singularly impressive, still help to establish this region among the global priorities for avian conservation. BirdLife International recognizes six Endemic Bird Areas partly or entirely within the Guinean Forest Hotspot: the Upper Guinean Forests, with 15 restricted-range and 11 threatened species; the Cameroon Mountains (which extend into Nigeria and also include the island of Bioko) with 29 restricted-range and 12 threatened species; the Cameroon and Gabon Lowlands with six restricted-range and two threatened species; the island of São Tomé with 21 restricted-range and eight threatened species; the island of Príncipe with 11 restricted-range and two threatened species; and the island Annobón (also Pagalu) with three restricted-range and two threatened species. Clearly, the Upper Guinean Forests, Cameroon Mountains, and Gulf of Guinea islands emerge as high global priorities for avian priorities within this region.

Among the birds, important flagship species for tropical forest conservation in the Upper Guinean Forests include the white-breasted guinea fowl (*Agelastes meleagrides*), white-necked rockfowl (*Picathartes gymnocephalus*), rufous fishing owl (*Scotopelia ussheri*), Liberian greenbul (*Phyllastrephus leucolepis*), Nimba flycatcher (*Malaenornis annamarulae*), and the Gola malimbe (*Malimbus ballmanni*). On the island of São Tomé, three endemic and critically endangered species can be added to the list of conservation flagships: the dwarf olive ibis (*Bostrychia bocagei*), the São Tomé fiscal (*Lanius newtonii*), and São Tomé grosbeak (*Neospiza concolor*).

Of the region's terrestrial vertebrates, we know least about reptile and amphibian diversity. Minimum species estimates for each class are 139 and 116, respectively, but these should be regarded as preliminary. Levels of endemism within the known herpetological faunas are relatively high, however, with 46 species of reptile (33%) and 89 species of amphibian (77%) found only with the Guinean Forest Hotspot. While none of these figures place the Guinean Forests among the highest priority hotspots for reptile and amphibian conservation, the fact that we know relatively little about the levels of diversity and endemism for these vertebrate classes in this region establishes more extensive zoological research as a clear priority.

In terms of non-fish vertebrate diversity, West Africa's Guinean forests rank an impressive eighth among the world's hotspots, with 1,320 species, very similar to the level observed in Brazil's Atlantic Forest region. In terms of non-fish vertebrate endemism, the Guinean Forests rank 12th among the hotspots, with 270 endemic species or about 20% endemism. Given the relatively large area of intact natural vegetation, ratios of vertebrate diversity and endemism to area are relatively low compared to other hotspots, but this again points to the need to expand the total area of natural habitat under formal protection in order to safeguard this regions biodiversity.

Levels of Protection for Biodiversity

The consensus recommendations of the Conservation Priority-setting Workshop underscore the need to strengthen and expand national protected areas and the systems that support them across the region. While some ambitious plans are being developed and pursued in several countries for reform of the protected area systems, protection in existing areas is not viable at current funding and capacity levels. Existing protected areas within the Guinean Forest Hotspot are listed in the table below. The degree to which they include natural intact vegetation is not known at present, nor is the degree to which levels of biodiversity and endemism are represented within these collective national parks, nature reserves and wildlife sanctuaries. However, responding to the extinction crisis resulting from the bushmeat trade, a recent analysis of primate conservation efforts within the hotspots has identified a number of these protected areas as especially high priorities for the Guinean Forest region. (In the table, these are indicated by an asterisk.)

Country	**Protected Area**	**Area (km^2)**
Guinea	Massif du Ziama Strict Nature Reserve	1,123
	Mount Nimba Strict Nature Reserve	130
Sierra Leone	Tiwai Island Game Reserve *	12
	Outamba-Kilimi National Park	808
	Gola Forest Nature Reserves *	176
Liberia	Sapo National Park *	1,307
Côte d'Ivoire	Azagny National Park	190
	Banco National Park	340
	Iles Ehotile National Park	105
	Marahoue National Park *	1,010
	Mount Peko National Park	340
	Mount Sangbe National Park	950
	Tai National Park *	3,500
	Mount Nimba Strict Nature Reserve	50
Ghana	Bia National Park *	78
	Digya National Park	3,478
	Kakum National Park	207
	Nini-Suhien National Park *	160
	Kogyae Strict Nature Reserve	386
	Bomfobiri Wildlife Sanctuary	53
	Owabi Wildlife Sanctuary	13
Nigeria	Cross River National Park *	4,000
Cameroon	Korup National Park *	1,259
Equatorial Guinea	Pico Basile National Park	350
	Southern Highlands National Park *	600
	TOTAL	**20,625**

Many of the 41 consensus priority areas identified by the experts fall outside of strict protected areas, some within a variety of classifications of management including faunal and forest reserves (or proposed protected areas). Still others fall entirely outside any protection or management regime. According to Conservation International's hotspot analysis, approximately 141,000 square kilometers (roughly 15%) of the Guinean Forest Hotspot retains its natural vegetation intact (Fig.2). It is also important to note that only about 20,000 square kilometers of the hotspot can be found in Strict Nature Reserves and other protected areas, which represents

less than 2% of the hotspot's original extent. This is well below the level of habitat protection recorded for the hotspots, which averages 40% of the natural vegetation intact.

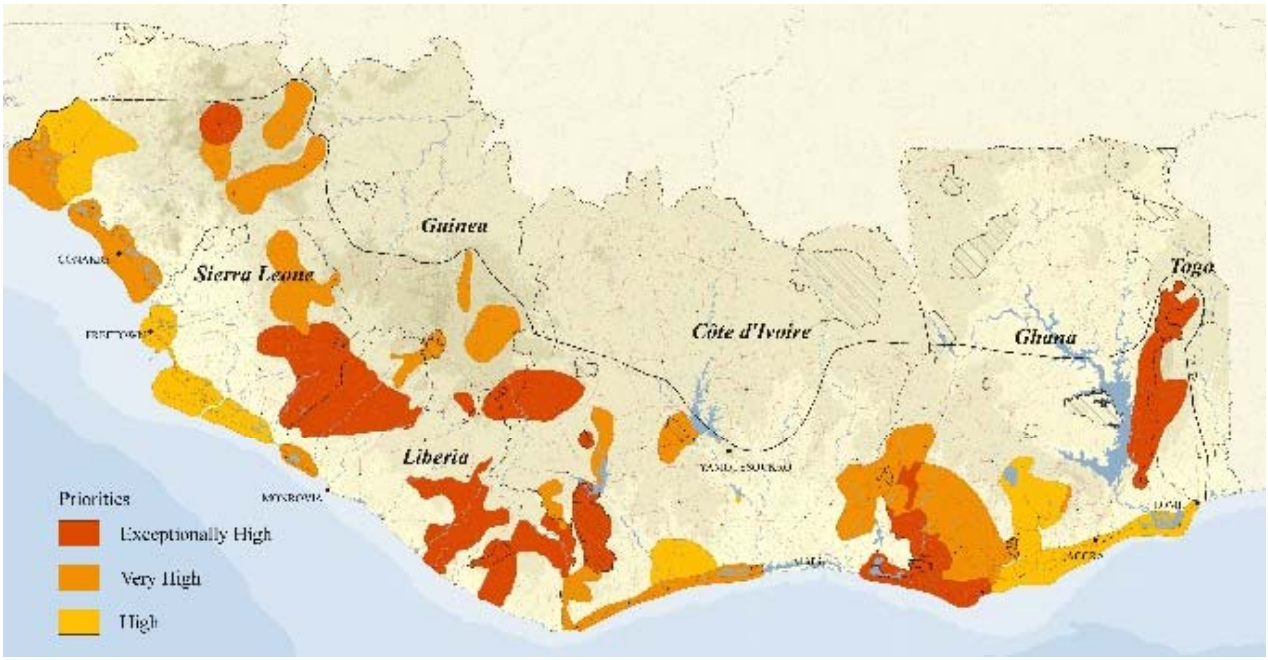

Fig. 2 Results of Priority-Setting Workshop: Upper Guinean Forest Ecosystem

Recommendations from the CPW include a priority emphasis on implementing the plans to establish the protected area system in Liberia, particularly in the northwest and southeast. Furthermore, experts encouraged initiatives such as those underway by Ghana to establish Globally Significant Biodiversity Areas. In many cases, recommendations include upgrading managed areas to national parks, nature reserves or wildlife sanctuaries, increasing levels of protection of resident biodiversity.

THREAT ASSESSMENT

The first decade of the 21st century could determine the future of biodiversity in West Africa. Principal threats to biodiversity and their root causes present a formidable challenge in a region that has lagged behind other parts of the world in terms of conservation investment and opportunity. CEPF's funding strategy includes support for initiatives that address threats to conservation progress in the region. Alliances of conservationists with other resource sectors, and partnerships among complementary organizations, will be needed in order to resolve threats, eliminate barriers to conservation, and halt or reverse the processes that have created the region's biodiversity crisis.

The Effects of Poverty

The vision statement of the African Development Bank (2000) declares,
"poverty alleviation is not just a noble goal and a worthy cause, but it is central to the achievement of long term sustainable development of the continent." Indeed, all of the region's threats to conservation are inextricably linked to poverty, which drives urgent short-term needs

that eliminate long-term opportunities. Much of the livelihood of the region's population is closely dependent on, or not far removed from, the natural resource base and the variety of goods and services that healthy, productive ecosystems can provide. Unemployment and weak development of human capital stimulates social unrest, human migration, ethnic tension, and land tenure conflicts, frequently near forested lands. Timber and mineral resources become currency for the purchase of arms, which are then used to foment civil conflict, eroding the rule of law, sound governance, and social capital. Lack of access to health care reduces work force productivity and promotes the spread of HIV and AIDS. Infrastructure for education, communication, and commerce is limited and inadequately maintained. This lack of public investment and personal opportunity, reflected in a widespread lack of institutional capacity in government agencies, NGOs, and communities, all combine with a low level of environmental awareness to create a challenging landscape for conservation success.

Tropical Rainforest Loss and Fragmentation: The Effects of Agriculture, Logging and Population Growth

The "plight of Guinea" began before the colonial period with widespread cultivation by the indigenous human population, which was then exacerbated during colonial times when the region was opened up to commercial plantations and large-scale logging. The effects of these policies were felt most severely in the British colonies of Sierra Leone, Ghana and Nigeria. In Sierra Leone, for example, forest exploitation began in the 1840s and reduced the overall forest cover from 70% to 6% in less than a century. The history of deforestation in Ghana and Nigeria has not been much better. Even in Liberia, which contains the largest remaining forest blocks in the Upper Guinea region, applications for concessions and the recent arrival of foreign logging companies constitute a clear and present threat to biodiversity conservation efforts in one of this hotspot's highest-priority areas.

Commercial logging in West Africa has historically been followed by slash-and-burn agriculture, which has exacted the greatest toll on the region's forests. The widespread practice of clearing, cultivating and then letting land lay fallow provides the major source of livelihood for the largely rural poor population of the forest region. Under low population pressures, slash-and-burn agriculture can be sustainable because fallow periods are often long enough to allow adequate reconstitution of soil fertility and restoration of the land's productivity. However, with populations now swelling throughout West Africa, fallow periods are becoming shorter and the demand for more "pristine" forested land, including that in parks and reserves, is increasing. The situation is aggravated by an influx of farmers from arid northern Africa. If the reliance on agricultural production remains prominent in this region, as is likely, this threat must be countered by measures that lessen the negative impact on biodiversity caused by traditional land management and growing methods.

Today, rapidly increasing population pressure is the most crucial factor in deforestation and land degradation in this region. For example, Nigeria is already the continent's most populous nation with more than 110 million people. With some of the world's highest annual growth rates, the populations of other West African countries are likely to double in size in the next two decades. Although this increase will not necessarily be concentrated in the remaining tropical forest ecosystems, the resulting demand for forested land will increase dramatically, and the pressure on existing protected areas will be even more severe than it already is. This will, no

doubt, lead to over-exploitation of forest resources and the potential extinction of threatened species, especially some of the larger mammals. The threat, therefore, is twofold: (1) critical tropical rainforest land not yet included in the national systems of protected areas of the Guinean Forest region are likely to be irreparably altered before appropriate levels of protection can be established and (2) lands that are currently under official protection will continue to be depleted of forest cover and their overall biodiversity because current levels of protection and enforcement may not be sufficient to mitigate growing population pressure. Efforts to counter this pervasive threat to biodiversity are probably best focused at the community level in the areas surrounding existing and proposed protected areas, where it is important that people understand and appreciate the contribution that these areas can make to environmental stability, human health and local economies.

Ecosystem Degradation: The Effects of Mineral Extraction, Hunting and Overharvesting

Both small-scale and industrial mining pose serious threats to the remaining tropical rainforests of the Guinean Hotspots, most of which are located on substrates rich in iron ore, diamonds, gold and bauxite. Large-scale mining is a particular concern in mountainous areas, such as Mount Nimba, where deposits of iron ore and bauxite are common and can severely affect freshwater systems and regional watersheds. Small-scale extraction of diamonds and gold poses threats to biodiversity through forest clearance and associated bushmeat hunting.

The hunting tradition is very strong in the Guinean forest countries, and bushmeat consumption has historically represented a significant source of protein for the rural population. The most commonly hunted game species are the larger birds and medium-sized mammals such as forest antelopes (duikers) and diurnal monkeys. Bushmeat hunting, like slash-and-burn agriculture, will not necessarily cause significant negative ecological impacts when practiced at subsistence levels in areas of low human population density. However, levels of bushmeat hunting in Central and West Africa have soared in recent years, especially as a function of logging. New logging roads provide easier access to formerly remote areas and allow hunters to move deeper into the forests. In addition to animals killed to meet subsistence needs, hunters are now being paid to shoot significantly more game to feed the growing number of logging crews, and they are not discouraged from shooting even more animals for sale in city markets. In fact, the logging companies that subsidize hunting to provide meat for logging crews also transport large quantities of bushmeat to major population centers. As a result, bushmeat hunting has now reached epidemic levels in the Guinean Forest region and is rightly blamed for the "empty forest syndrome" (the absence of wild animals in otherwise intact forest). It is also largely responsible for driving several of West Africa's primate species to the brink of extinction -or maybe even beyond, as suggested by reports that no evidence of Miss Waldron's red colobus can be found in its former range in Ghana and Côte d'Ivoire despite several intensive surveys over the last few years. This threat will be difficult to combat without the cooperation of foreign logging companies that now subsidize the over-exploitation of native wildlife. It will also need to be attacked at the market level due to consumers' willingness to pay much higher prices for bushmeat. Bushmeat hunting is a large-scale problem that will require a comprehensive strategy to address. CEPF resources will help mitigate bushmeat trade, but CI's Center for Applied Biodiversity Sciences will take a more active leadership role in addressing this issue.

Coastal zones are also under intense pressures, including pollution, habitat degradation, erosion, overexploitation, and degradation of marine resources. Urbanization along coasts is high, and human population growth rates range from 3-5%. Fish, mollusks, and crayfish serve as principal protein sources for coastal populations, and they are increasingly transported upcountry to interior markets. Sea turtles and their eggs are over harvested. Mangrove forests are intensively used by communities and are under threat of clearing for aquaculture. Local interests in coastal resources face competition from multinational companies for fisheries as well as mining of oil and minerals -which creates additional ecosystem pressures.

Limited Local Capacity for Conservation: The Effects of Insufficient Professional Resources and Minimal Biodiversity Information

Local capacity to carry out conservation work in this region appears to be lower than in any other top-priority hotspot, except perhaps Indo-Burma. Recent survey data do not exist for many key species or for the most important protected areas, and many of the region's national parks, nature reserves and wildlife sanctuaries are inadequately funded and staffed. There are very few trained specialists in environmental conservation, wildlife management or restoration ecology, and overall there is a low level of international involvement in conservation. NGOs are few and have yet to play a significant role in conservation. Similarly, the links between conservation and the West African academic community, in the form of research assistance and as repositories of information, are limited. When the low capacities in these areas are combined with the historic lack of regional planning and integration needed in order to foster international dialogue, it is easy to understand the lack of an effective conservation plan for the ecoregion as a whole. Clearly, a great investment must be made in the training of biologists and resource managers, in combination with basic surveys of biodiversity in the existing protected area networks and beyond. Conservationists need to know, more accurately and in greater detail, to what extent biodiversity is distributed throughout this hotspot, to what degree it is presently protected, and where the broadest gaps in protection are.

Governance: The Effects of Political and Cultural Fragmentation and Civil Conflict

The cultural diversity of the Guinean Forest Hotspot is reflected in the vast number of languages spoken by different ethnic groups in each of the countries. Many of these are split across national borders, so that their political reality is shaped by the drastically different legacies of the Dutch, German, French, British, Spanish, Portuguese and freed slaves in Liberia and Sierra Leone. In the period since independence, nation-building has been prioritized over regional cooperation. As a result, the hotspot is fragmented not only in terms of forest cover, but also of language, infrastructure, and legal and financial systems. Cross-border tension limit international collaboration. At national levels, weak accountability and quests for power lead to corruption, which can neutralize good policy where it does exist.

The continuum of conflict, ranging from tension to warfare to post-conflict recovery, presents challenges to conservation at every point. Protected areas in Côte d'Ivoire face encroachment and unrest from migrant farmers searching for settlement lands and agricultural sites. Refugees from Liberia and Sierra Leone flee into forests in adjacent countries, settle, and survive by hunting already-reduced populations of wildlife. War is waged over the control of diamond and timber resources. The 600,000 or more refugees who have settled in Guinea exceed the capacity of that country’s forests to provide fuelwood, building materials, and other products.

The threat to biodiversity conservation posed by national and regional conflict must be met with conservation efforts rooted at the local level and fully supported by the people in charge of implementation. This should help reinforce the commitment of institutions that can provide large-scale support and that must remain confident that essential programs will continue even during times of civil unrest, corruption and uncertain governance.

ASSESSMENT OF CURRENT INVESTMENT

This section provides a breakdown of the various donors, government agencies, NGOs, academic and research institutions, and private-sector concerns that play a significant role in biodiversity conservation in the Upper Guinean Forest Ecosystem. Many programs and activities described here will also appear in a subsequent section of this profile that describes opportunities for CEPF investment.

Multilateral and Bilateral Investment

For the region overall, foreign donor assistance accounts for approximately 9% of the aggregate Gross Domestic Product of West African countries. Of this amount, approximately half is derived from multilateral sources and half from bilateral sources. The principal multilateral sources include the **World Bank**, the **International Monetary Fund**, the **African Development Bank** (ADB), the **United Nations** agencies, and the **European Union**. **France, Germany, Japan**, the **United States**, the **Netherlands** and **Canada** are the largest bilateral donors.

The prevailing trends in multilateral and bilateral donor investment in West Africa are relevant to biodiversity conservation only by comparison, not as a focus of the investments themselves. In fact, the portion of this support directed to biodiversity or, more generally, to environmental conservation has accounted for only 0.1% of the total investment by these countries and institutions over recent decades. In the region, conservation has been regarded as a luxury compared to the alleviation of poverty and refugee needs. Meanwhile, environmental degradation undermines the resources on which future economic growth and development depend.

Regional Programs of International Support

Support from the **Global Environmental Facility**, channeled to **Conservation International** through the **United Nations Development Program**, was instrumental in conducting the West African Conservation Priority-Setting Workshop (From the Forest to the Sea: Biodiversity Connections from Guinea to Togo) in December 1999. As noted, many of the recommendations from the workshop form the basis for strategic directions that will be supported by CEPF.

The **World Bank**-funded initiative that is most relevant in the region is the West Africa Pilot Community-Based Natural Resource and Wildlife Management Project. While the project's focus is on drylands outside the Guinean Forest Hotspot, it is relevant for two reasons. First, it is an ongoing ambitious transboundary initiative in the region (between Côte d'Ivoire and Burkina Faso), and second, it promotes connectivity by working with communities on compatible land uses bordering national parks, and promotes sustainable use by building capacity for conservation-based enterprise.

The **African Development Bank** (ADB), based in Abidjan, Côte d'Ivoire, unites 53 African member countries and 24 nonregional members. Recognizing the importance of a strong resource base, the ADB has added environmental protection to its strategic areas of focus, and in its vision statement identifies environment and gender as two cross-cutting issues that will pervade all of its operations and sectoral activities. Additionally, its role in supporting good governance in member countries is described as "probably the single most important catalytic role the Bank will play in the years ahead in the fight against poverty." The ADB's developing role in resource management and multisector planning is expected to expand in the coming decade.

Similarly, the role of the Economic Community of West African States (ECOWAS) is expected to expand as its Early Warning Observatory becomes operational. Already involved in issues of governance, peace, and security, this regional entity now includes environmental degradation and monitoring among its goals. The 16 nation members of ECOWAS share a commitment to reduction of economic barriers across national lines, and consider environmental and resource management to be essential strategic components of a strengthened regional economy.

National Government Agencies

A large portion of the international support for environmental projects in West Africa is channeled through government ministries and institutions whose objectives include the management and regulation of natural resources. The agencies in each country in the Guinean Forest Hotspot are:

Côte d'Ivoire	Ministry of Construction & Environment Direction de la Protection de la Nature Protected Area Management Program Société de Développement des Forêts
Ghana	Ministry of Lands and Forestry Forestry Commission Wildlife Division Forestry Division Ministry of Environment, Science and Technology Environmental Protection Agency Water Resources Commission
Guinea	Administration et Coordination des Grands Projets Direction Nationale de l'Environnement Direction Nationale des Eaux et Forêts Direction Nationale des Mines
Liberia	Ministry of Planning and Economic Affairs Forestry Development Authority National Environmental Commission of Liberia
Sierra Leone	Ministry of Agriculture, Forestry, and the Environment

	Forestry Division
Togo	Ministère de l'Environnement Direction de la Faune et de la Chasse

National Programs that have Received International Support for Biodiversity

These are examples of national programs that have received support from international donor agencies for projects implemented by the government agencies listed above.

Côte d'Ivoire

National Protected Areas Management Program (PCGAP): Côte d'Ivoire's 12-year National PCGAP has been launched at a projected cost of US$68 million to enhance the country's protected-area management capacity, both by broadening the array of partners and improving the relationship between people and protected areas. National implementing agencies will be the **Ministry of Construction and the Environment** and the **Directorate for Nature Protection**. Because implementation of the strategy implies important legal and institutional reforms as well as major capacity-building efforts, PCGAP will be implemented in phases using the **World Bank's** Adaptable Program Lending mechanism, with multiple donors participating.

Primary goals for the PCGAP are to:
1. provide the Government of Côte d'Ivoire with the capacity to effectively manage protected areas over the long term;
2. develop and implement sustainable resource management strategies that enhance NGO, private sector and community involvement; and
3. restore most protected areas to ecologically acceptable levels.

The development objective will be achieved by establishing an appropriate legal framework, creating new institutions to manage the technical and financial aspects of the system, and investing in activities in the protected areas themselves.

Groundwork has been laid for PCGAP with resources from government, **GEF Block C**, **EU STABEX** funds and contributions by the **World Wildlife Fund** and **Conservation International**. Simultaneous work has focused on establishment of a new national institution for protected area management and the stabilization of three protected areas (Marahoué, Comoe and Mt. Peko) under the "Programme Transitoire." The project financing plan includes US$15 million from the **International Development Association**, US$12 million from the **Government of Côte d'Ivoire** and US$41 million in co-financing from the **European Development Fund** (EDF), **Fonds d'Aide et de Cooperation**, **Agence Francaise de Développement**, **GEF**, **Kreditanstalt Fur Wiederaufbau** (KfW) and the **World Wildlife Fund**. This support will be directed toward deforestation, biodiversity protection, land tenure and land management.

UNDP-GEF: The GEF Small Grants Programme (GEF/SGP) was launched in 1992 by UNDP. The GEF/SGP provides grants of up to US$50,000 and other support to community-based organizations and NGOs for activities that address local problems related to the GEF areas of concern. Since its inception, the GEF/SGP has funded over 1,500 projects in Africa, North America and the Middle East, Asia and the Pacific, Europe, and Latin America and the Caribbean. Today, the programme is operational in 50 countries, including Côte d'Ivoire.

The GEF/SGP recognizes the essential role that households and communities, applying locally appropriate solutions, can play in conserving biodiversity, reducing the likelihood of adverse climate change, and protecting international waters. The program operates on the premise that people will be empowered to protect their environment when they are organized to take action, have a measure of control over access to the natural resource base, have the necessary information and knowledge, and believe that their social and economic well-being is dependent on sound long-term resource management. However, the GEF/SGP is more than simply a fund that provides small grants to improve the local environment. By raising public awareness, building partnerships, and promoting policy dialogue, the GEF/SGP seeks to create a more supportive environment within countries for achieving sustainable development and addressing global environment issues.

The decentralized structure of the Small Grants Programme encourages maximum country and community level ownership and initiative. UNDP-GEF Small Grants Programme is supporting a project for the protection and recovery of degraded mangroves in an area near the Azagny National Park in Fresco.

Ghana

In Ghana, the **United States Agency for International Development** (USAID) has invested heavily in Kakum National Park and has pledged US$2 million to endow the **Ghana Heritage Conservation Trust**, as part of an economic growth through resource conservation initiative in Ghana's Central Region. Other important biodiversity investment in recent years has come through the **European Union**, which has focused on an integrated development and conservation program for Bia and Ankasa National Park, and several major **World Bank** initiatives over the past decade in the forest and wildlife sectors that laid the groundwork for a National Resource Management Program.

Natural Resource Management Program (NRMP): The government of Ghana has obtained a US$8.6 million grant from the **GEF** to support implementation of the Biodiversity Component of its US$90 million NRMP, for which the World Bank is coordinating investments from several donors. This program will be conducted under the auspices of the Ministry of Lands and Forestry. In Phase I of the NRMP, the Biodiversity Component will be implemented to identify, document, establish and legally protect two new types of strict protected areas, Globally Significant Biodiversity Areas and Provenance Protection Areas, in remnant dry forests of southern Ghana. All of the targeted forests are currently listed as forest reserves and are not included within the national system of protected areas.

The NRMP seeks to establish an appropriate national policy and an effective institutional framework for sustainable natural resource management, and to develop and test resource management systems. There are five project components:

• First, high-forest resource management will establish forest policy and legal framework, design and test integrated forest reserve management systems, and encourage private-sector involvement in settings on and off forest reserves.

• Second, savanna resource management will develop new multidisciplinary approaches to dry lands management, and will improve systems for community-based management of savanna woodland and other resources.

• Third, wildlife resource management will retrain personnel in the Wildlife Department and introduce park and reserve management plans.
• Fourth, environmental management coordination will support district-level planning and monitoring, and will improve information flow among sectoral agencies.
• Fifth, biodiversity conservation efforts will develop and implement integrated reserve management plans.
Recent talks have raised the prospect of integrating the follow-up program to the Coastal Wetland Management Program, creating a strategic package.

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The **UNEP-GEF** project description under development is "Preparation of a Trans-Boundary Diagnostic Analysis for the Integrated Management of the Volta River basin."

The objective is to prepare a Transboundary Diagnostic Analysis, a preliminary outline of a Strategic Action Programme (SAP), and a GEF Project Brief. The project aims to establish the framework for a consensus-building process for which the long-term purpose is to secure global environmental benefits by reducing the degradation of the Volta River basin.

All the activities to be implemented in the PDF-B are designed as preparatory actions, and require a regionally collaborative SAP.

The project brief that will be submitted to the GEF will outline the modalities of operation and management of the full project. The document will include identification of priority short-term actions -i.e., pilot projects. More specifically, the project brief will include a list of activities required for the formulation of an SAP- such as additional studies; demonstration projects to test feasibility and costs; priority investment projects; and capacity-building at national and regional levels, including an analysis of baseline and incremental costs.

The **GEF/SGP** is also funding a Hippo Conservation Project on the north border of the Bui National Park, to be implemented by Conservation International, as well as two projects in the Western Region: Wantram Sacred Grove Conservation in an off-reserve area, and a second project that supports NGO efforts to conserve on and off-reserve forests in exceptional hotspots by maximizing returns per unit area of forest land in ways that are compatible with forest conservation.

Guinea

Guinea received support from the **USAID**, approximately US$4 million of which has been directed to the Guinea Natural Resources Management Project completed in September 1999. This project focused on the Fouta Djallon Highlands. It is being followed by the Expanded Natural Resources Management Project, which will run through the year 2005 and include other forested regions of Guinea, possibly those of the southeastern portion of the country.

The **European Commission** has supported watershed-based regional planning in the northern sector of the country, including the establishment of national parks and agricultural and infrastructure development.

UNEP-GEF is in the process of developing a project brief on "Integrated Management of the Fouta Djallon Highlands" with UNEP functioning as the lead IA with support from World Bank and UNDP. The Executing Agencies at a regional level are International Co-ordination Office (ICO/OAU) of the FDH-IRDP, Conakry, Guinea, in collaboration with ECOWAS.

The main objectives of the GEF project to be developed during the PDF-B are the conservation and sustainable use of the international watersheds and the biodiversity resources of the Fouta Djallon Highlands that are of paramount importance for the subregion. The GEF project will draw on the experiences and information collected by the Fouta Djallon Programme coordinated by ICO-OAU, to promote holistic approaches to integrated ecosystem management and to design participatory and community-based strategies for management of basin slopes in the Fouta Djallon Highlands that will lead to *in-situ* conservation and sustainable use of soil, water and biota. These activities are also expected to mitigate downstream effects of land degradation in the international river basins that originate in the Highlands. The project will take a watershed approach to ensure transfer of best practices and lessons learned between different river catchments, and to identify socially and culturally acceptable approaches that are economically viable; the resulting improvements in land management and catchment management will be disseminated throughout the Highlands. The project will also draw on the broad political support for the OAU-coordinated program from the eight member states watered by rivers originating in the Highlands.

Liberia

Liberia's ratification of the Convention on Biodiversity is still pending approval by the Secretariat; until it is approved, Liberia will not be eligible for CEPF support or any GEF investment. The UNDP and European Union resident representatives have both taken personal leadership to initiate the first significant biodiversity investment since Liberia's civil war. Last year UNDP pledged US$350,000 to establish the National Environmental Commission, and the EU approved a US$750,000 for a forest assessment that requires 20% matching funds. In addition, the U.K.-based Darwin Initiative has recently invested US$100,000 in Sapo National Park, the country's sole protected area.

Sierra Leone

Biodiversity investment in Sierra Leone in recent years has been limited to extremely small sums through regional NGOs such as the Environmental Foundation for Africa and individual field research biologists.

NGOs

The NGO community in West Africa includes local, national and international entities, many of which have interests in natural resource management and conservation -including management of natural habitats, investment in capacity-building, and better communication regarding the significance of conservation efforts.

Local and National NGOs: Local NGOs vary significantly with regard to their institutional capacity and the degree to which their activities focus on biodiversity conservation. Many are young institutions that lack experience. Others function largely as consultants to development agencies, working on contracts. Many have a limited geographic scope. The leading NGOs in this region, in terms of their past and potential contribution to biodiversity conservation, have worked on biodiversity conservation projects in the past, maintain an active presence with government agencies, and have track records that indicate leadership potential for the civil sector. These are:

Ghana Wildlife Society
Guinée Ecologie
Society for the Conservation of Nature in Liberia
Conservation Society of Sierra Leone
Côte d'Ivoire-Nature
Nigerian Conservation Society

The **Environmental Foundation for Africa**, based in Monrovia, Liberia, has worked successfully in the U.K. to raise awareness and build support there for the region. The foundation has emphasized the impact of conflict on conservation. Although small and young, its focus and leadership occupy a unique niche among regional organizations.

International NGOs dedicated to biodiversity conservation in the region are relatively few. **World Wide Fund for Nature – International (WWF-IT)** maintains a regional office in Abidjan, Côte d'Ivoire, providing conservation support to a large region extending from Senegal to Nigeria. In Côte d'Ivoire, WWF-IT serves as partner to the government for the management of Comoe National Park and participates in a consortium that advises the government on the development of PCGAP. **BirdLife International** is involved in a parallel role in Mt. Peko National Park and has been active designing initiatives on the Côte d'Ivoire side of Mt. Nimba and participating in the PCGAP consortium. The third NGO consortium member in Côte d'Ivoire is **Conservation International** (CI), which has its project base in Marahoué National Park. CI also has been involved since 1992 in Ghana, starting with the Central Region Natural Resource and Cultural Heritage Conservation Project and maintains offices in Accra and Cape Coast. **WWF-Cameroon** is now actively involved in efforts to survey and monitor wildlife populations in the Takamanda and Mone Forest Reserves, especially the critically endangered Cross River gorilla, and to upgrade the status of these reserves to that of national parks. **Flora and Fauna International's** project roster includes the upcoming Liberia forest assessment and Mt. Nimba (Guinea side) GEF project. **Wetlands International** has a regional office in Dakar, Senegal, and to date has had more intensive involvement west of Guinea (outside the Guinean Forest Hotspot), but is potentially a strong ally.

Academic Institutions

With only a few exceptions, the involvement of West African institutions of higher learning in conservation is best described as minor. Progress suffers for lack of available researchers, analysts, and facilities that can support baseline studies, periodic monitoring, and training. Nevertheless, with appropriate strengthening, this sector could be positioned to fortify the conservation community significantly.

One way to strengthen the capacity of West African universities to contribute to conservation efforts is to promote exchange and collaborative work with foreign universities that have been active in the region. There are several good examples of foreign university programs that have already established such collaborations or could do so. The **University of Wageningen** (Netherlands) and its ECOSYN Project has conducted a series of vegetation studies and botanical surveys in the Upper Guinea region. The **University of Quebec** (Canada) has initiated an environmental studies program at the **University of Conakry**, Ghana. **Beaver College** (United States) has established the Bioko Biodiversity Protection Program in collaboration with the **Universidad Nacional de Guinea Equatorial**, the focus of which is the long-term monitoring and ecological study of Bioko's endemic primates.

Likely national academic partners from West African countries to participate in future activities of this nature include:

Ghana	University of Ghana – Legon University of Cape Coast University of Science and Technology (Kumasi)
Côte d'Ivoire	Université de Cocody (Abidjan) Université d'Abobo-Adjamé
Guinea	Université de Conakry
Liberia	University of Liberia
Sierra Leone	University of Sierra Leone (Freetown)

Research Institutions

Many national research institutions in West Africa region are quasi-governmental entities affiliated with universities from which they remain distinct. Like universities, their capacities and infrastructure are severely constrained, but their missions and output could be strengthened as part of the effort to provide greater benefit to national conservation efforts. Many of these research institutions already participate in the development of national conservation strategies and contribute to impact assessments for development agencies. These research institutions are potential partners in regional biodiversity conservation efforts:

Ghana	Center for African Wetlands (regional), Legon Center for Development Studies, Cape Coast Remote Sensing Applications Unit, Legon
Côte d'Ivoire	Bureau National d'Etudes Techniques et de Développement Centre de Recherche en Ecologie, Abidjan Centre de Recherche Océanologique Centre Suisse de Recherche Scientifique

Guinea	Centre de Recherche Scientifique de Conakry Rogbane Centre National des Sciences Helieutiques de Boussoura

Private Sector

The private sector, in this context, includes businesses and companies whose profits are derived from the exploitation of natural resources through logging, mining, oil and gas, and fisheries, but which could contribute to biodiversity conservation by adopting environmentally and socially responsible practices — and by giving financial and logistical support to specific projects. Historically, private-sector support for conservation has not been strong in this region, however, the potential is considerable and early interest from companies such as **Rio Tinto Mining and Exploration Ltd.** is promising. Airlines, particularly **British Airways**, have also supported the conservation community with in-kind services and through the design of industry-selected "conservation travel" awards.

CEPF NICHE FOR INVESTMENT IN THE REGION

In developing this profile, root causes were considered, including: poverty; civil unrest and political instability, lack of national-level policies for conservation; and limited opportunities for education. More proximate threats include local community activities that are incompatible with biodiversity conservation, bushmeat hunting and lack of local awareness of conservation issues and biodiversity values. Given the small amount of money available through CEPF for this corridor, project designers had to make some choices regarding resource allocation. This project is fundamentally regional and transboundary in its approach. As such, it proposes to address some national-level root causes directly, such as policies for conservation. In other cases, it addresses more proximate-cause issues, such as implementation problems at the level of communities and municipalities. The communications component seeks to build a constituency for conservation at the national, regional and local levels. Recognizing that its resources are limited, CEPF has always proposed to play a strategic coordination role and in so doing leverage considerably more resources in support of conservation than it could possibly bring to the table itself. In this spirit, CEPF proposes to invest significantly in activities that will focus the many disparate efforts at work in this vast corridor while ensuring that the best and most objective information is available to shape decision-making by a broad range of actors. In this way, CEPF expects to influence the root causes of biodiversity loss, albeit indirectly in some cases.

It has been determined that the most strategically compelling niche for CEPF is to focus on filling the gaps between existing efforts and investments. For this reason, defining the mechanisms to ensure the proper coordination among existing efforts is a major component of each of the profiles.

It must also be understood that the set of CEPF objectives is not meant to resolve all of the threats described in the profile. CEPF is one small element of much larger strategies in each ecosystem. Given the current levels of investment, the programs and strategies already in place and those anticipated, CEPF strives to fill a particular niche that has yet to be addressed at the level required for positive impact. This niche, and the main objective of CEPF, is to provide civil society, organizations, and individuals with the capacity to manage biodiversity conservation more effectively. CEPF focuses on this group based on the hypothesis that sustainable biodiversity conservation will only be realized if civil society groups existing within

the critical ecosystems drive the process. To extend the logic, if these groups become the actors and voices for biodiversity conservation, then decision-makers will begin to incorporate these issues into national and transboundary policies, legislation and action. Only if this impact is achieved will resources from CEPF be able to realize sustainable biodiversity conservation.

CEPF INVESTMENT STRATEGY AND PROGRAM FOCUS

CEPF's current investment will focus on the Upper Guinean Forest Ecosystem of the Guinean Forest Hotspot, based on the expert consensus of the Conservation Priority-Setting Workshop. The Lower Guinea portion of the hotspot may become eligible for investment from CEPF in the future. For both CEPF and the CPW there are a variety of justifications to dividing this 11-country hotspot. First, as noted, there is a biogeographic separation of Upper and Lower Guinea by the dry zone known as the Dahomey Gap. Second, because the Guinean Forest Hotspot covers a culturally diverse and politically complex area, a narrow focus is more feasibly implemented than a broad agenda. However, there are some types of conservation action that will be best organized hotspot-wide and this investment strategy provides guidelines that encourage the exchange of lessons between Upper and Lower Guinea and sets in motion hotspot-wide coordination for long-term monitoring.

As noted, the CEPF investment strategy builds on recommendations of priority areas and actions that resulted from the CPW. In response to the threat of fragmentation in West Africa, a primary direction of the CEPF program there is to support connectivity. Fragmentation is not only ecological -it also characterizes the region's political, administrative, and social systems. Consequently, CEPF seeks to establish connections not only among forest fragments, through either biophysical links or through standardized management approaches, but also among agencies that have not traditionally coordinated their activities across national borders and with regulations and policy instruments that would harmonize approaches to biodiversity conservation.

CEPF priorities will be to counter the most serious threats to biodiversity in this region, including:

• **forest loss and fragmentation** due to agricultural expansion, exploitative logging and rapid population growth;
• **ecosystem degradation** due to extractive practices such as mining and bushmeat hunting;
• **limited local capacity for conservation** due to insufficient professional human resources, minimal information, lack of regional mechanisms and limited cross-border collaboration; and
• **institutional elements** (policies, regulations, and practices) that undermine conservation effectiveness.

The thematic foci of this investment will include:

Institutional Strengthening, including capacity-building, training, and technical assistance, to help increase of protection for biodiversity by:

• supporting development of conservation professionals;
• strengthening protected-area management practices;

• commissioning biological surveys and other needed research;
• providing resources to analyze the feasibility of using financial incentives to promote biodiversity conservation;
• leveraging additional investment for conservation in West Africa; and
• strengthening policy instruments and intersectoral support for biodiversity conservation.

Development of Conservation Corridors, to expand the application of conservation practices in a variety of land-use contexts, including:
• agricultural landscapes;
• transfrontier areas;
• civil conflict zones; and
• watersheds.

Increased Public Awareness to broaden support for, and understanding of, biodiversity conservation at local and national levels, including:
• value (cultural and social) and amenities of forests and protected areas;
• impact of bushmeat trade and unregulated hunting; and
• global significance of local resources.

Hotspot/Regional Biodiversity Database establishment, to monitor and track conservation progress and challenges.

1. Strengthening Institutional Capacities for Conservation

Training, Networks, and Protected Area Management

In terms of research and management capacity, the Guinean region lacks expert botanists, wildlife ecologists, environmental educators, protected-area managers, and law enforcement officials. Through CEPF, training in these related fields will be supported through participation in biological surveys and other field activities; resident programs based at existing parks and reserves; and scholarships for study at national and foreign institutions. Similarly, efforts to connect professionals through networks of scientists, academics, and area resource managers will be instrumental in reducing the tendency for each country's cadre of professionals to "reinvent the wheel" when addressing conservation challenges.

Innovative protected-area management programs, such as the one overseen by Conservation International at Ghana's Kakum National Park during the late 1990s, provide fine models and natural classrooms for national and regional professional training programs. In the case of Kakum, this includes a very successful ecotourism strategy that could benefit biodiversity conservation efforts at other national parks and nature reserves throughout the Guinean Forest Hotspot. The ecotourism aspect of such training could also attract partners and support from the private sector.

Along the border of Ghana and Côte d'Ivoire, vast cultivated areas have fragmented forests, and there is well-organized, but illegal, commercial surface mining and extraction of non-timber forest products within the region's system of forest reserves and protected areas. A critical need in this region is training in law enforcement, conservation education, and GIS and land-use management techniques to support biodiversity conservation.

While working with the scientific and conservation communities, efforts should also focus on training and employing an appropriate number of law enforcement officials (guards and rangers) for those same protected areas. This is one of the best ways to reduce threats to biodiversity within parks and reserves due to human encroachment and illegal extractive activities. Significantly increased law enforcement may be the most effective way to curtail bushmeat hunting, which should be halted within protected areas. A commitment to the enforcement of existing wildlife laws also presents an opportunity for CEPF to leverage considerable funding from other sources, such as from the pool of multilateral and bilateral donors that are supporting Côte d'Ivoire's PCGAP.

The next step, and just as important, will be to develop approaches for long-term ecological monitoring of wildlife populations and ecosystem functions within existing protected areas. This initiative should build on professional expertise already in place and should increase the number of conservation professionals at work within the region's national protected area systems to an effective level.

As Côte d'Ivoire's PCGAP becomes operational, it will be necessary to bridge support for essential operations of the Ministry of Construction and Environment and the Directorate of Nature Conservation. To ensure that tens of millions of dollars of future funding from multilateral and bilateral sources are put to the best use, a relatively modest amount of CEPF funding could be used in the short term by civil society to support the efforts of the appropriate national partner agencies, especially those that focus on protected areas of the Krahn-Bassa/Sapo/Grebo/Taï-N'Zo Complex in southwestern Côte d'Ivoire.

Also in Côte d'Ivoire, as well as in Liberia, there is a trend toward involving NGOs (such as Côte d'Ivoire Nature and the Society for the Conservation of Nature in Liberia) in the management of national protected areas. CEPF support of such collaborations could add a new dimension and broader support to government programs that are currently under funded and understaffed. The resumption of management efforts in Liberia's Sapo National Park, following years of abandonment during the country's civil war, would be a good focal point for such support.

Research: Catalyzing Comprehensive Biological Surveys in Priority Areas

As noted earlier, there is inadequate information about biodiversity in the existing protected areas of the Guinean Forest Hotspot. Current data were assembled for the CPW, and the results reflect multiple geographic and thematic gaps. A series of surveys is needed to fill those gaps. Provisions for a number of these targeted surveys already exist in national inventory programs to be funded by multilateral and bilateral donors; such funding would reduce the need for, and would complement, CEPF support for this effort.

The CPW assessment acknowledged limited research capacity in most countries in the region. The institutions and experts involved recommended the integration of training, capacity building, and international teams in all survey work undertaken. Economies of scale, including bilingual efforts, are recommended in order to stimulate collaboration among colleagues in neighboring countries and to stimulate additional national-level efforts based on international projects.

Before surveys are conducted, a thorough investigation of previous information from these areas is in order. Targets will include:

• areas rated by the CPW as having significant needs for biological research;
• areas rated by the CPW as having high biological value;
• areas for which the generated information will have immediate practical bearing on priority management challenges; and
• areas in which biological assessments would be feasible, taking political stability into account.

During the CPW, participants were asked to rate priority areas according to research needs. The areas prioritized for further scientific research in three or more of the thematic groups (Mammals, Birds, Insects, Reptiles and Amphibians, Plants, Freshwater and Marine) are (as shown in Figs. 3 and 4):

• A3 - Loma-Tingi Hills Complex (Birds, Insects and Freshwater)
• A4 - Scarvies Riverine Forest (Mammals, Plants, Marine)
• B8 - Gola/Ziama Complex (Birds, Insects, Plants)
• C2 - Eastern Liberian Moist Lowland Forest/Sapo National Park (Mammals, Insects, Plants)

Such inventories would provide the basis for an ongoing biodiversity monitoring network that would provide researchers and policy makers with access to constantly updated information in the form of an early warning system. Currently, the lack of reliable data precludes measurement of forest cover and biodiversity in the region. There is no established baseline from which to calculate change. With reliable data, threats to biodiversity will be more easily detected and mitigated. Additionally, biological research stations remain undeveloped in the region. Their roles -not only as sources of new information, but in maintaining a management presence in protected areas- merit attention and long-term financial support.

Institutional Assessments and Policy Instruments

Long-term funding for conservation is inadequate throughout the region. Funding opportunities in the region are limited and financial mechanisms to create conservation funds have not been adequately explored. Similarly, policy instruments to create conservation incentives, or to eliminate disincentives, have rarely been considered. Varying regulations between countries create a mosaic of management prescriptions that result in the region's fragmented approaches to ecosystem management, especially in transboundary watersheds.

CEPF will seek to leverage a range of policy and regulatory instruments to evaluate their potential to resolve barriers to conservation. These include support for improved law enforcement and strengthened regulations, and for assessment of potential financing mechanisms and incentives that, where appropriate, can influence land use trends. The creation of the Ghana Heritage Conservation Trust has broken new ground in creating conservation funds that support protected areas. Similarly, efforts in Côte d'Ivoire to create a quasi-national parks management agency, drawing on international support for funding, has led to modification of national policies to support biodiversity. While CEPF will not fund the capitalization of trust funds, nor provide resources for conservation set-asides, it will provide funds to evaluate the feasibility of such mechanisms. Private-sector engagement in key corridors will be sought as well. Conservation International's new **Center for Environmental Leadership in Business** has already committed

matching funds and expertise to assess the most strategic private-sector conservation opportunities across the region and will provide technical assistance to engage corporations thought to have the greatest opportunities for investment.

2. Establishing a Hotspot Biodiversity Monitoring System

Concurrent with the biological surveys would be the development of a regional biodiversity database, mostly archiving biological information regarding the existing national parks, nature reserves and wildlife sanctuaries. The database would also serve as a repository for information about Guinean forests currently unprotected, which is essential to the broader long-term biodiversity conservation goals for the region. This database project like the surveys, may need to be managed initially by foreign specialists, but it would provide employment and significant training opportunities for their West African counterparts.

Building an operational monitoring system to evaluate trends in the Upper Guinea Forest requires a multifaceted approach addressing biological systems, socioeconomic factors, and institutional capacities. First, a standard monitoring protocol is needed to make accurate measurements of indicators used to correlate relationships within the ecosystem. Identifying gaps in scientific efforts, and establishing geographic priorities for research, will help focus investment and incorporate the best scientific methodology available. Ideally, a network of institutions staffed with local biologists in each of the six West African countries will be developed to provide the necessary capacity to survey and monitor the status of critical species and habitats.

This strategy will be tailored to the specific national contexts, including institutional capacity, ecological and biological significance, and socioeconomic threats. Establishing a baseline of knowledge at a country level is required in order to implement the protocol. In addition to conducting surveys and developing a regional biodiversity database, CEPF support will be used to strengthen the reference libraries and information management systems of key national NGOs and to promote independent, longer-term ecological studies by West African biologists. This includes incorporating current museum collection records for each country's biodiversity into a database to retrieve information from past field surveys — a process that will enhance understanding of the biogeography of the region. Prioritizing areas within the region based on their biological characteristics will provide a rough map of the greatest concentrations of biodiversity and identify areas ripe for field surveys. These priorities will form a baseline of information from which to deduce changes and specific threats.

The last step in this process will be the actual collection and analysis of data specified as inputs into the monitoring strategy. Field data must be well documented, validated, and distributed in a logical package to all stakeholders. Additionally, data must be fed into a monitoring system that allows the evaluation of indicators both temporally and comparatively. Remotely sensed data will be a key input to the system, providing up-to-date information on the extent, condition, and integrity of the forest ecosystem. Two regional organizations are in the process of developing environmental information systems: the African Development Bank, based in Abidjan, developing a centralized knowledge and information system for all 40+ member countries; and ECOWAS, which has taken initial steps to develop an Environmental Monitoring Information System. These initiatives will help to disseminate and store data

collected for the monitoring protocol, enhancing government's access to better information concerning biodiversity.

3. Developing Conservation Corridors
Intersectoral Initiatives For Biodiversity Conservation
Success factors are likely to reside as much in sectors and agencies outside of parks and wildlife departments as within them. Thus, CEPF initiatives that successfully integrate biodiversity concerns into other public or private sectors, such as forestry, agriculture, mining, tourism, governance, and development, will broaden conservation impact beyond its traditional and limited scope by expanding stewardship responsibilities and commitments. Such integration will be favored by partnerships that address overlapping areas of interest and responsibility. Recent integration of efforts by the forestry and wildlife sectors in Ghana is one example in which biodiversity assessments of forest reserves contribute to management plans. CEPF support for assessment of forest reserves in other countries in the region would actualize these links between institutions. Similarly, the cocoa sector in the region, especially in Ghana, is becoming cognizant of the nexus between agriculture and biodiversity, and efforts are needed to identify "win-win" solutions and incentives that integrate conservation considerations into agriculture.

The 41 priority areas identified during the CPW (Fig. 2) include fragmented forests and coastal ecosystems. Natural areas found within these priority sites emerge as key foci for place-based CEPF conservation projects and could ultimately function as core areas in larger corridors for protection of biodiversity and ecosystem functions. Of the intact forest remaining in the six-country region, the largest portion (43%) is believed to remain in Liberia. Côte d'Ivoire share is estimated at 28%, Ghana at 16%, Guinea at 8%, Sierra Leone at 5%, and Togo at 0% (though remnant patches still exist).

Transfrontier Collaboration
Of all 41 CPW priority areas, 25% occupy transfrontier lands. Overcoming political and administrative fragmentation, by developing collaborative efforts that focus on the biological and environmental resources shared throughout the Upper Guinea region, will prevent these critical areas from “falling through the cracks" in the region. International support for these key areas will be sought, especially from entities that have regional oversight and which join countries in forums that consider regional issues such as African Development Bank and ECOWAS.

The three largest forest complexes in the region can be viewed as clusters of priority areas, and illustrate comprehensive conservation initiatives in the region. They include the Gola/Lofa/Mano complex of Sierra Leone and Liberia, the Krahn-Bassa/Sapo/Grebo/Taï complex of Liberia and Côte d'Ivoire, and the fragmented *forêts classées* and forest reserves of eastern Côte d'Ivoire and western Ghana respectively. On a coarse scale, these three clusters range across a west-east continuum of threats dominated by conflict, logging, and agricultural expansion. Each cluster reflects the challenges that would be faced in any of the priority areas they comprise.

Cluster 1: Sierra Leone-Liberia
The Gola/Lofa/Mano Complex represents a mix of lowland forests on the Sierra Leone and Liberia border (A2). This priority area represents the westernmost extent of many plant and animal communities within the Upper Guinea forest ecosystem. Though poorly studied and largely inaccessible by researchers and conservationists in recent years, the area still contains

large tracts of contiguous forest for the potential establishment of core-protected areas. These include the Gola Forest Reserves in Sierra Leone and the Lofa-Mano National Forests in Liberia, each of which could be upgraded to National Parks or Strict Nature Reserves. The contiguous nature of these cross-border forests also presents opportunities for transfrontier conservation initiatives between the two countries.

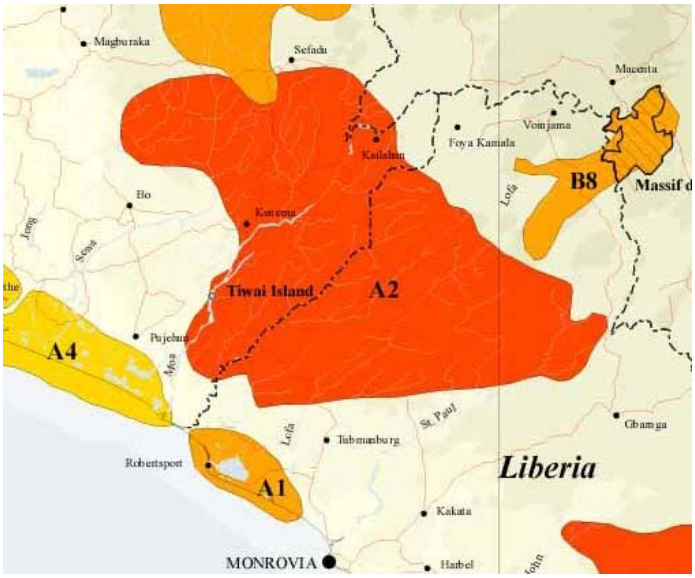

Fig. 3. The Gola/Lofa/Mano complex of Sierra Leone and Liberia.

Both the Liberian and Sierra Leonean portions of this complex have experienced a high degree of civil conflict over the past ten years. The highly porous border between Sierra Leone, Liberia, and Guinea to the north has allowed several groups of competing factions to move freely between countries. Since the end of the civil war in Liberia, there are indications of increased settlement, shifting agriculture, hunting and general human disturbance along with the resumption of full-scale logging activities. Furthermore, violence has again flared up in the Liberian portion of this complex and continues to displace local peoples in some areas and to increase pressure from refugees in others. Persistent civil unrest in the Sierra Leone portion of the complex continues to cause tension among government, rebels, and international intervention efforts providing peacekeeping and humanitarian assistance.

Choosing from a range of priority needs for the Gola/Lofa/Mano complex, CPW participants placed an emphasis on first undertaking a rapid biological assessment and, second, updating scientific knowledge, notably the capacity for remote sensing in the area. Furthermore, regional experts noted, "Collaboration with the respective governments of Guinea, Sierra Leone and Liberia is important, with the aim of incorporating management strategies into national conservation action plans."

Cluster 2: Liberia-Côte d'Ivoire

The Krahn-Bassa/Sapo/Grebo/Taï complex contains the largest tract of contiguous forest left in the entire Upper Guinea ecosystem and represents the greatest opportunity to establish and maintain protected areas containing large intact stands of forest. Most of the forests in eastern Liberia (C1-C4) emerged as extremely high regional priority sites and include prospective core areas like Sapo National Park, Krahn-Bassa National Forest, and the Grebo National Forest. Taï

National Park (C6) in Cote d'Ivoire is the single largest existing forest protected by a national park in the region and offers a potentially good opportunity for transfrontier conservation along the Liberian border.

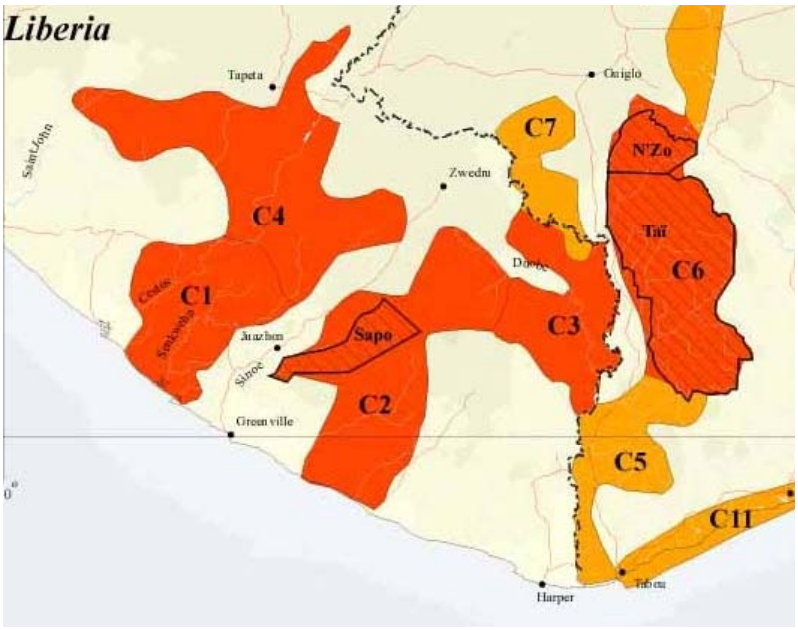

Fig. 4. The Krahn-Bassa/Sapo/Grebo/Taï complex of Liberia and Côte d'Ivoire

In the Liberian portion of the complex (C1, C4, C2, and C3), a range of new disturbances is underway within forest areas believed to be mostly intact. After the civil war, scientists working in the region in 1997 observed little disturbance to areas of forest not formally exploited for timber. In fact, observations indicated that in many areas wildlife had made a comeback during the war. However, since 1998, human settlement, farming, and hunting have steadily advanced into the forest. Such activities have generally followed a pathway opened up by a new Malaysian timber operation that built a major highway into the remaining forest clusters. The operation currently extracts an estimated 50,000-80,000 cubic meters of timber per month, which could destroy the remaining forest blocks in less than five years. Lack of enforcement of existing forestry legislation reflects the limited capacity of the Liberian Forest Development Authority and inadequate environmental governance in general. Scientists participating in the CPW documented the primary threats to the forest ecosystem as timber extraction, road construction, and increased human settlement, which leads to a higher intensity of farming and hunting. Recommended interventions include updating scientific knowledge, conducting biological surveys, building capacity within the forest development authority, and reassessing the protected area network. Major stakeholders in this region include the Oriental Timber Company, the Liberian Forest Development Authority, the Society for Conservation of Nature in Liberia, and a diverse array of local communities from several ethnic groups.

The Ivorian side of the complex (C7, C6, C5) has, by contrast, a host of threats affecting biodiversity. Industrial plantations of cocoa, rubber and palm have increased pressure on the surrounding landscape by drawing in workers who supplement their wages by farming in adjacent forests. Furthermore, human pressure, intensified by the arrival of thousands of

Liberian refugees during the 1990s, has continued along the border region. The growing population has increased demand for bushmeat and small-farmer agricultural production. Low-level gold mining also occurs in this area, which threatens to increase erosion and siltation of aquatic systems.

Experts at the CPW recommended several specific interventions for the Ivorian side of the complex:
1. taking an inventory of unknown areas to the northwest of Taï National Park on both sides of the Cavally River;
2. measuring the impact of conservation activities on wildlife using Taï National Park as a reference point;
3. developing a transnational approach to conservation to harmonize wildlife management;
4. developing regional tourism as an alternative income source; and
5. investigating the potential for upgrading the protection status of the region's protected areas.

Cluster 3: Côte d'Ivoire–Ghana

This complex includes a large number of forest reserves in Côte d'Ivoire and Ghana. The 10 priority sites in this complex are largely contiguous, providing an opportunity for landscape approaches to conservation that could incorporate existing forest fragments as "core" areas. The existing landscape contains wet evergreen, moist evergreen, and moist semi-deciduous vegetation zones. Several national parks — Bia, Ankasa and Kakum — contain remnant wildlife populations of species typical of the eastern Upper Guinea (i.e. the area east of the Bandama River, Côte d'Ivoire). Sadly, this is the first region to have recorded the extinction of a large mammal, with the recent report of the apparent disappearance of Miss Waldron's red colobus. Until the mid-1970s, this subspecies of red colobus was known in a few localities within this region.

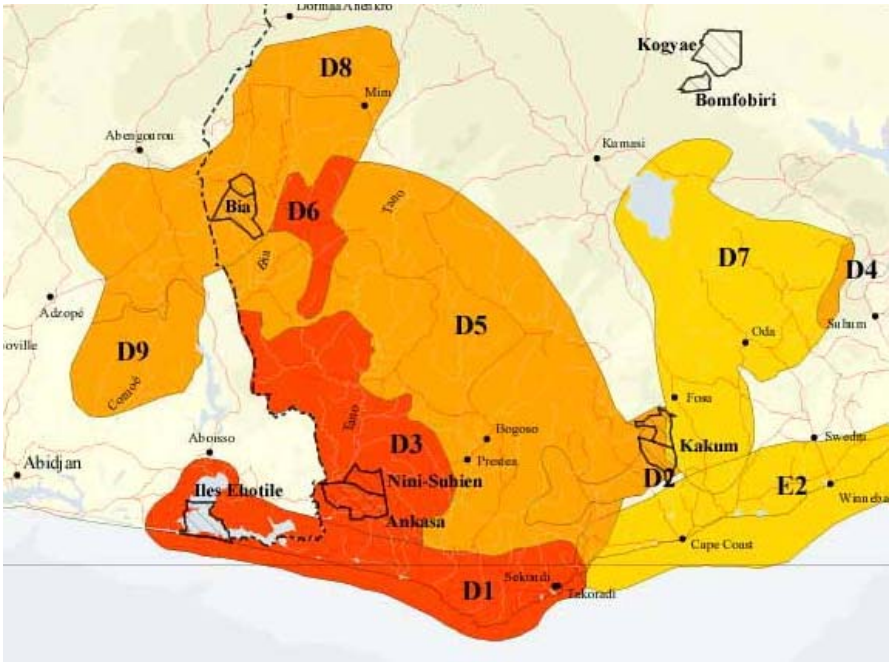

Fig. 5. Fragmented forests of Côte d'Ivoire and Ghana

Threats documented by scientists at the Conservation Priority-Setting Workshop include vast areas of cash/food crop cultivation resulting in forest fragmentation, well-organized illegal

extraction of non-timber forest products, timber extraction, and commercial-scale surface mining. Recommended responses include training in law enforcement, conservation education, and GIS and land-use management. Experts recommended that long-term conservation strategies for the region include ecological monitoring, community participation, conservation education, land-use management, and rapid assessments and biological inventories.

Conservation Corridor Coordination and Strategies

Fragmentation of landscapes inhibits or alters flows of genetic materials, water, and wind. It also isolates small populations and places biological resources in the fragments at greater risk. Furthermore, fragmentation can lead to piecemeal interventions for conservation when more extensive landscape approaches may be more effective. Corridor feasibility, function and establishment have not been appropriately explored in the region as a means to counteract fragmentation. However, CPW priority areas, especially in clusters, offer opportunities for landscape management and regional planning.

Corridor strategies in these areas, coordinating the integration of multiple sectors and using protected areas as anchors, will be promoted under CEPF as part of CPW follow-up and implementation. The range of activities for corridor development includes biological surveys, aerial photography and remote sensing imagery analyzed in GIS packages, multi-agency planning, enterprise development, and community outreach and awareness. Whether corridors become physical presences in the landscape, or whether they are conceptual patterns that broaden management approaches to include transfrontier efforts or cross-border watersheds, they can serve as valuable units for protecting biological and other natural resources on the ground. Multisector initiatives will also be instrumental in leveraging investments from multiple donors to corridors. Corridor coordination will also be linked clearly with the Hotspot Biodiversity Monitoring System.

4. Public Awareness

Initiatives developed at the local level are essential to the success of larger-scale national and regional conservation programs. These are most often created as collaborations between communities and NGOs. CEPF grants will be directed to such collaborations to support environmental education programs, appropriate agroforestry extension services, the replacement of slash-and-burn agricultural techniques with cash-crop production, ecotourism guide training, and other employment opportunities that biodiversity conservation programs may generate. In the process, CEPF will also be sensitive to the institutional needs of the NGOs involved, and will be prepared to help sustain their continued participation in regional efforts.

Awareness campaigns will also be supported at the national level within countries whose forests constitute the Guinean Forest Hotspot. Broadened impact will result from projects that successfully increase biodiversity awareness among potential partners, decision-makers, and the general public. Campaigns to educate consumers about impact of the bushmeat trade, and to inform the judiciary of wildlife laws and regulations, will contribute to efforts to reduce the impact of unregulated hunting. Conservation International's Center for Applied Biodiversity Sciences (CABS) has supported a regional bushmeat assessment workshop and will contribute to a national campaign in Ghana on the subject. The bushmeat trade is a problem requiring a multi-pronged, extensive strategy. Since this is such an important challenge, CEPF resources will

focus on supporting additional initiatives, led by CABS and others, to reduce the bushmeat trade, rather than mobilizing to combat the threat independently.

There is a growing trend in Ghana and Guinea for local communities to become involved in conservation planning. CEPF support for such grassroots activities would be most appropriate in communities surrounding existing protected areas based on a model employed by Conservation International at Kakum National Park in Ghana. Kakum has been the site of innovative programs in revenue-sharing, community outreach, enterprise development, agroforestry, and environmental education, all of which can be replicated throughout the region.

There is an urgent need for conservation education in communities that surround forest reserves along the border of Ghana and Côte d'Ivoire, a region that is currently being ravaged by over-exploitation of forest resources. Education programs would be linked to biological surveys aimed at upgrading protection levels in extractive reserves.

5. Biodiversity Action Fund
In order to respond to unforeseen circumstances that affect biodiversity conservation, and to facilitate inter-institutional coordination and small-scale capacity building, it is recommended that CEPF provide resources to establish a Biodiversity Action Fund. Small grants from the Biodiversity Action Fund will range in size but no single grant will exceed US$10,000.

SUSTAINABILITY

The CEPF Investment Strategy will be funded over a period of three years and represents the beginning of a larger process to bring about sustainable biodiversity conservation within the region. It is therefore important to highlight the sustainability of the CEPF strategy beyond the initial three-year funding period. There are three key elements to the sustainability of these objectives; the first, already noted, is a tremendous current level of investment within the region by several multilateral and bilateral organizations, government agencies, and international and local NGOs. In order to build on this, CEPF plans to encourage sustainability by building local capacities, the second key element of sustainability. Much of the implementation of biodiversity conservation efforts is currently done by outside organizations and the focus of CEPF is to build local capacities to take over much of this role and for these civil society groups to take the lead on conservation efforts. Capacity alone, however, may not be sufficient. Financial resources for biodiversity conservation will remain a critical issue for sustainability. For this, through cultivation of partnerships and alliances, CEPF hopes to leverage new funding for biodiversity conservation. This is the third element of sustainability. It is expected that quality results from CEPF projects will generate increased interest and confidence in the donor community leading to increased investment. The combination of local capacity and increased overall funding, together with current levels of investment in the region, should lead to greater biodiversity conservation impacts that can be sustained for a long time to come.

While the overall sustainability hypothesis is logical and sound, there will be much to learn from each individual CEPF grant project. Accordingly, all project proposals will include a section in which external risk factors and long-term sustainability issues will be addressed. Projects will be required to highlight key external factors that might reduce the benefits of their activities and discuss plans to mitigate these. Applicants will also explain how they see the objectives of their specific projects carrying forward after the initial CEPF funding period. All

of this will be shared on the CEPF web site, allowing other project teams to learn from successful risk mitigation strategies and sustainability measures put in place by various projects. To continue this process after the initial project design phase, grantees will revisit these issues in each of their quarterly project performance reports. The purpose is not only to highlight risk and sustainability at the outset, but also to track these critical issues throughout the life of each project.

CONCLUSION

The CEPF investment strategy for West Africa builds on priority areas and actions identified during the Conservation Priority-Setting Workshop held in Elmina, Ghana, in 1999. Consensus recommendations from the 140 participants created a blueprint for conservation investment in the region that addresses the most pressing threats to the forests and coastal zones of the six-country area. Drawing on the expertise of conservationists, biologists, ecologists, economists, sociologists, and planners, the CPW examined biological criteria within a socioeconomic context. By highlighting biological diversity and species endemism against a backdrop of threats to their continued existence, CPW results point to the most important sites for conservation and the issues that must be confronted to conserve them: lack of institutional and human capacity, destructive land-use practices, limited conservation awareness, underdeveloped environmental processes, and weak governance.

By stepping beyond a set of recommendations that is exclusively biological, the CPW results illustrate the broad approach that must be taken among institutions and sectors if natural environments are to be conserved in West Africa. For environments to function properly, supporting a full complement of species and providing a wide range of goods and service, multiple roles and initiatives must converge in new ways. That convergence is already beginning, with similar goals and needs assessments appearing independently within the strategies of a wide range of donor agencies, NGOs, and governments. Linking these varied convergences of mission with specific actions in the region through the collaborative work of alliances is the primary focus of CEPF.

CEPF is intended to provide a rapid response to conservation needs, to complement initiatives already underway, and to stimulate wider participation in conservation in West Africa. Immediate actions now to "hold the line" on the biodiversity crisis, stabilize protection, and to begin building alliances to rescue the hotspot will establish a positive trend toward the long-term vision of ecosystem health and stability in a region eager for solutions.

APPENDIX 1

Summary matrix of general description, biological priorities, existing core protected areas, socio-economic threats, and research and conservation priorities for regional priority sites from Guinea to Togo

Sub-Region	**Regional Priority Site ID**	**General Description of Landscape and Locality**	**Biological Priorities**	**Existing Core Protected and Managed Areas** *(National Parks, Forest Reserves, Forêt Classées, and National Forests)*	**Socio-Economic Threats** *(Land Use, Civil Conflict, Extractive Industries, and Protected Areas)*	**Research and Conservation Priorities**
North Western Region (Sierra Leone, Liberia, and Guinea)	A11 and A12	A12 is the coastal area of mangroves in northern Guinea, extending from the Guinea-Bissau border to just south of Tougnifili. A11 abuts this coastal area and extends inland to Sangaredi and Boké to accommodate important drainage basins (Kogon River). The area is well known for bauxite mining.	Plants (mangroves vegetation), Birds, Freshwater (fishes), and Marine (coastal mangrove ecosystem)		*Land Use:* Extraction of firewood, fishing, hunting and rice paddies *Civil Conflict:* Over-hunting, deforestation, disturbance of water courses, search for alternative sources of revenue by displaced populations and refugees, sand mining, small scale diamond and gold mining, commercial overexploitation of marine resources, coastal erosion, water pollution, and land degradation.	Both sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed
	A7, A8,	All four areas are	Insects	Forêt de Sala	*Land Use:* Hunting,	All sites need

	A9, and A10	within the Fouta Djallon mountain area in Guinea. The landscape consists of rolling hills with savanna and naturally fragmented forests in the valleys. The mountain range is an important source of several major rivers in West Africa. It is also an important agricultural region in Guinea.	(butterflies) and Freshwater (fishes)	Forêt de Nialama Forêt de Bakoun Forêt de Dokoro Forêt de Bouia Forêt de Bani Forêt de Dar es Salam	bush fires, farming and settlement within classified forests, overgrazing of pastureland, poor agricultural systems/methods and erosion of soils. *Civil Conflict:* Uncontrolled fisheries, deforestation, over-exploitation, disturbance of water courses, and habitat degradation by refugees	update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed
	A5 and A6	This area includes the coastal mangrove zone north (to Boffa) and south (to the Sierra Leone border) of Conakry, capital of Guinea. It is important for the agriculture and fisheries industry.	Plants (mangroves), Birds, Freshwater (fishes) and Marine (coastal mangrove ecosystem)		*Land Use:* Extraction of firewood, fishing, hunting and rice paddies *Civil Conflict:* deforestation, forest degradation and destruction by refugees *Extractive Industries:* Mining Process	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, and training are needed
	A4	This area encompasses all of the Sierra Leone coastal mangroves, stretching north from the Guinea border to south to the Liberian border. It also	Plants (mangrove vegetation), Birds, Mammals, Herps, Insects (butterflies), Freshwater (fishes), and	Western Area Forest Reserve	*Land Use:* Logging, firewood, charcoal, hunting and trapping, and cutting of bush poles. *Civil Conflict:* Forest degradation and	Area needs update of scientific information through quick assessments and ecological studies; habitat restoration,

		includes several major estuaries, the entire island of Bonthe, and forests on the Freetown Peninsular.	Marine (coastal mangrove ecosystem)		destruction, uncontrolled logging by refugees and displaced persons *Protected Area:* Poaching, lack of capacity to control or limit access	establishment of new protected area, improved protection of existing protected area and training are needed
	A3	Includes the Loma and Tingi Mountains, and adjacent lowland areas (including Lake Sonfon) in Sierra Leone. The vegetation is primarily semi-deciduous forest.	Plants (semi-deciduous forest), Birds, Mammals, Herps, Insects (butterflies), and Freshwater (fishes)	Loma Mountain Forest Reserve Tingi Hills Forest Reserve Tonkoli Forest Reserve Tama Forest Reserve	*Land Use:* Overgrazing; bush fires, mining for diamonds and gold, logging and road construction, agriculture and settlements. *Protected Area:* Encroachment on existing forest reserves from agriculture and settlements, poaching, lack of awareness and community involvement in management.	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, and training are needed
	A2	Primarily lowland moist evergreen forest vegetation. Extends from the Kambui Hills in Sierra Leone across the Liberian border to the Lofa-Mano National Forests. Includes important	Plants (evergreen forest), Birds, Mammals, Herps, Insects, and Freshwater (fishes)	Tiwai Island Game Sanctuary Gola National Forest Gola West Forest Reserve Gola East Forest Reserve Gola North Forest	*Land Use:* Hunting; logging; shifting cultivation and agricultural expansion. *Civil Conflict:* Deforestation through increased agricultural activities (shifting cultivation) by refugees	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area,

		drainage basins for the Sewa, Moa, Mano, and Lofa rivers. Important for agriculture and small-scale mining activities.		Reserve Kangari Hills Forest Reserve	and internally displaced persons *Protected Area:* Logging, poaching, and mining for diamonds	and training are needed
	A1	Area is centered on Lake Piso in western Liberia and extends along the coast to include estuaries of the Lofa River.	Plants (coastal forest and mangrove vegetation), Birds, and Marine (coastal mangrove ecosystem)	Cape Mount Nature Reserve	*Land Use:* Poaching, logging and shifting cultivation (agricultural expansion). *Civil Conflict:* Deforestation and habitat degradation by refugees and internally displaced persons *Protected Area:* Farming (subsistence)	All sites need update of scientific information through quick assessments and ecological studies; restoration, establishment of new protected area, and training are needed
Mount Nimba Range (Liberia/Guinea/Cote d'Ivoire)	B3, B4, and B5	Mountainous zone, stretching across Guinea, Ivory Coast and Liberia. Biosphere reserve and world heritage. Equatorial humid forest, drained by several waterways, very rich in endemic fauna species (birds, mammals, reptiles, insects) and flora.	Plants (montane forests), Birds, Mammals, Herps, Insects, and Freshwater (fishes)	Mount Nimba Nature Reserve Scio Forest Reserve Mont Peko National Park Mont Sangbe National Park	*Land Use:* Agriculture and hunting; exploitation of the forest resources, mining, logging and road construction, and settlements. *Civil Conflict:* Deforestation, sand mining, commercial overexploitation of marine resources, coastal erosion, water pollution, deforestation and land degradation due to refugees. *Protected Area:*	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed

					Poaching, encroachment by refugees, road construction, lack of effective surveillance, lack of community participation in management, and agriculture	
	B7, B8 and B9	B7 and B9 are both mountainous extensions situated in Guinea, and covered mostly by tropical moist forest vegetation. B8 extends from the Wologisi mountain range in Liberia to the Ziama Massif in Guinea. These mountain ranges contain headwaters of several major rivers including the Lofa and St. Paul River's.	Plants (montane forests), Birds, Mammals, Herps, Insects, and Freshwater (fishes)	Wologisi Mountain Nature Reserve North Loma National Forest Ziama Massif	*Land Use:* Agriculture, hunting, logging; shifting cultivation (agricultural expansion) *Civil Conflict:* Deforestation, sand mining, commercial overexploitation of marine resources, coastal erosion, water pollution, deforestation and land degradation due to refugees and internally displaced persons *Protected Area:* Poaching, encroachment by refugees, road construction, lack of effective surveillance, lack of community participation in management, and	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed

					agriculture	
South Western Region (Liberia and Cote d'Ivoire)	C1, C2, C3, C4, C5, C6, and C7	Encompasses much of the lowland evergreen forest areas of southeast Liberia and across the Cavally River into Western Cote d'Ivoire. C1 is mostly wilderness area between the Cestos and Sehnkwen Rivers in Liberia and contains one of the most unique forest types for Upper Guinea. This area receives the highest rainfall in Upper Guinea, up to 4000 mm. C7 is covered with lowland evergreen rainforest with a few large inselbergs.	Plants (lowland evergreen forest vegetation), Birds, Mammals, Herps, Insects, and Freshwater (fishes)	Krahn-Bassa National Forest Gbi and Gbo National Forest Sapo National Park Grebo National Forest Forêt Classée de Haute Dodo N'Zo Faunal Reserve Taï National Park Forêt Classée de Cavally-Gouin	*Land Use:* Rubber and oil palm plantations, farming in forest and wildlife hunting, road construction, settlements. *Civil Conflict:* Forced migration, movement and settlement of refugees and internally displaced persons *Extractive Industries:* Timber extraction, and small scale mining *Protected Area:* Agriculture encroachment, potential for expansion of cocoa and coffee in Cote d'Ivoire, mining and poaching.	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed
	C8 and C9	C8 lies in Upper Sassandra river basin, and includes a zone of transition from evergreen forest to driest type of semi-deciduous forests at medium altitude. The landscape also includes inselbergs, riverine forest, and	Plant (semi-deciduous forest vegetation), Birds, Mammals, Herps, and Insects (butterflies)	Forêt Classée de Haute Sassandra Marahoué National Park	*Land Use:* Urban migration in south west region of Cote d'Ivoire, agriculture; exploitation of forest resources, hunting, cash cropping (cocoa) *Protected Area:* Agriculture encroachment, overexploitation of	Both sites need update of scientific information through quick assessments and ecological studies; habitat restoration, improved protection of existing protected area and training

		savanna. C9 is also primarily transitional zone, and includes semi-deciduous forest with savanna vegetation dominated by *Borassus* palm.			forests, potential for expansion of cocoa and coffee in Cote d'Ivoire, mining, poaching and inadequate protected area management.	are needed
	C10 and C11	Includes the lower Sassandra river, and coastal area between the Cavally and Bandama Rivers. The area is interspersed with urban centers, and includes a major East-West road. The vegetation is coastal evergreen rainforest, with coastal lagoons, swamps, marshes, and mangroves.	Plants (coastal forests and mangrove vegetation), Birds, Mammals, Herps, Insects, Freshwater (fishes), and Marine (coast mangrove ecosystem)	Forêt Classée de Niegre Forêt Classée de Monogaga Azagny National Park	*Land Use:* Agriculture (numerous plantations), exploitation of forests, migration for agricultural labor, habitat conversion, industrial plantation development, timber exploitation, over-fishing in coastal areas *Civil Conflict:* Refugee migration and settlement *Protected Area:* Agriculture encroachment (and associated bush fires), uncontrolled hunting and fishing, invasion of exotic plants, demographic pressure, and inadequate protected area management.	Both sites need update of scientific information through quick assessments and ecological studies; habitat restoration, improved protection of existing protected area and training are needed
	C12	This site lies on the southern most part of savanna (south of the	Plants (semi-deciduous forest and riverine	Lamto Forêt classée de La Téné		

		V-baoulé). Includes primarily forest-savanna transition zone with riverine vegetation along the Upper Bandama River.	vegetation) and Herps			
Eastern Region (Cote d'Ivoire and Ghana)	D1	Coastal lowland and promontories between Abi lagoon in Cote d'Ivoire and west of Takoradi Town in Ghana. Includes beaches with rocky outcrops and promontories, islets, coastal lagoons, swamps, and river estuaries. Vegetation is mainly composed of mangroves, palms (coconut, oil, etc.), grass and evergreen forest, including an area of primary forest (Cape Three Points).	Plants (lowland forest and mangrove vegetation), Birds, Mammals, Herps, Insects, Freshwater (fishes) and Marine (coastal mangrove ecosystem).	Cape Three Points Forest Reserve Neung Forest Reserve îles des Ehotiles National Park	*Land Use:* Poaching, logging and shifting cultivation (agricultural expansion). *Protected Area:* Agriculture encroachment, overexploitation of forests, poaching and inadequate protected area management.	Needs update of scientific information through quick assessments and ecological studies; habitat restoration, improved protection of existing protected area and training are needed
	D8 and D9	Includes all of remaining lowland forests in Eastern Cote d'Ivoire. The vegetation is moist evergreen forest. Riverine vegetation is also included as part	Plants (moist evergreen forest), Birds, Mammals, Herps, Insects (butterflies), Freshwater (fishes)	Forêt classées de Mabi Sognan-Yaya-Tamin Forét classée de Bossématie	*Land Use:* Logging, hunting, agriculture, exploitation of forest, urbanization	Both sites need update of scientific information through quick assessments and ecological studies; habitat restoration, establishment of

		of the Comoe River drainage basin.				new protected area, improved protection of existing protected area and training are needed
	D2, D3, D5, and D6	This area encompasses the lowland forests in the Western, and Central Regions of Ghana. The vegetation is wet evergreen to moist evergreen with rainfall of 1500-2000mm. There are also large areas of moist semi-deciduous forests, primarily cocoa farming areas. An important drainage basin for several major rivers including the Bia, Tano Sui and Pra. The terrain is undulating, hilly and difficult to access. This is Ghana's main cocoa production area, and includes important mining areas for gold.	Plants (evergreen and moist semi-deciduous forest), Birds, Mammals, Herps, Insects, and Freshwater (fishes)	Ankassa Game Production reserve Nini-Suhien Bia National Park & Game production reserve Dadiasco Forest Reserve Kakum National Park Assin Attandaso Game Production Reserve	*Land Use:* Logging, hunting, agriculture, extraction of firewood, fishing, and rice paddies *Extractive Industries:* Timber extraction, hunting. *Protected Area:* Agriculture encroachment, lack of institutional capacity, increased access to locals, population explosion, mineral exploitation, poaching, deforestation.	All sites need update of scientific information through quick assessments and ecological studies; habitat restoration, improved protection of existing protected area and training are needed
	D4 and D7	D7 consists of scattered, partly degraded forest reserves, including the	Plants (moist evergreen forest), Birds, Mammals, Herps, and	Neung Forest reserve Atewa Range Forest Reserve	*Land Use:* Logging, hunting, agriculture, and urbanization. *Extractive Industries:*	Both sites need update of scientific information through quick assessments

		Nkawkaw scarp and the Atewa Range Forest Reserve (D4). The landscape is covered mainly by moist semi-decidous forest, and is generally gentle rolling up to the escarpment at Nkawkaw near Atewa Ranges where the land rises to about 600m. The Atewa Range (D4) includes a series of highlands between 300-600m above sea level. Rainfall in this region is between 1500-1800mm.	Insects (butterflies)		Illegal mining activities and land degradation.	and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed
Togo Highlands and Eastern Ghana Coastal Region	E1	This area extends from the Volta region in Ghana to the eastern highlands of Togo. It is characterized by a series of mountain ridges running almost north-south. The vegetation is moist semi-deciduous forest with pockets of forest-savanna transition areas.	Birds, Mammals, Herps, and Insects (butterflies)	Kyabobo National Park Fazao-Malfakassa National Park	*Land Use:* Hunting, agriculture, and exploitation of forest resources	Needs update of scientific information through quick assessments and ecological studies; establishment of new protected area, improved protection of existing protected area and training are needed
	E2	Includes marshes and	Plants (mangrove	Shai Hills	*Land Use:* Agriculture,	Needs update of

		mangroves, coconut groves, lagoons, freshwater depressions and adjoining grasslands along Ghana's Eastern Coast.	vegetation), Birds, Mammals, Insects (butterflies), Freshwater (fisher), and Marine (coastal mangrove ecosystem)	Resource Reserve	bush fires, hunting and Urban migration, coastal exploitation (fisheries)	scientific information through quick assessments and ecological studies; habitat restoration, establishment of new protected area, improved protection of existing protected area and training are needed

APPENDIX 2

Institutional Affiliations of Conservation Priority-Setting Workshop Participants: "From the Forest to the Sea: Biodiversity Connections from Guinea to Togo"
December 6-10, 1999

Côte d'Ivoire:
Agroforesterie et Gestion des Aires Protegées
Centre de Recherche en Ecologie
Centre de Recherche Océanologiques
Centre Suisse de Recherche Scientifique
Bureau National d'Etudes Techniques et de Développement
Société de Développement des Forêts
Direction de la Protection de la Nature
ECOSYSN
GEPRENAF Project
Ministère de l'Environnement et de la Forêt
Network for Environment and Sustainable Development
Tropenbos Foundation
Université d'Abobo-Adjame/CRE
University of Cocody

Ghana:
Environmental Protection Agency
Ghana Wildlife Society
Ministry of Lands and Forestry
University of Ghana, Legon
University of Science and Technology
Water Resources Commission
Wildlife Department

Guinée:
Administration et Coordination des Grands Projets
Centre de Recherche Scientifique de Conakry Rogbane
Centre National des Sciences Halieutiques de Boussoura
Direction Nationale de l'Environnement
Direction Nationale des Eaux et Forêts
Direction Nationale des Mines
Institut de Recherche Environnementale de Bossou
Université de Conakry

Liberia:
Environmental Foundation for Africa
European Commission
Forestry Development Authority
Ministry of Planning and Economic Affairs
Refugee Repartriation and Resettlement Commission
Society for Conservation of Nature in Liberia

Sierra Leone:
Conservation Society of Sierra Leone

Ministry of Agriculture, Forestry, and the Environment
University of Sierra Leone

Togo:
Direction de la Faune et de la Chasse
Ministère de l'Environnement

International:
American Museum of Natural History-USA
Biodiversity Support Program-USA
BirdLife International
Chester Zoological Gardens-UK
Conservation International
Eberhard-Karls-University-Tuebingen-Germany
ECOSYN-Wageningen University-The Netherlands
Food and Agriculture Organization (FAO)
GEF - UNDP/PNUD Regional Bureau for Africa
ICRAM-Italy
Institute of Zoology-UK
Instituto di Ecologia Applicata-Italy
International Soil Reference and Information Center
Jardins Botaniques-Switzerland
National Museums of Kenya
Natural History Museum-UK
New England Aquarium-USA
Northwestern University-USA
Population Action International-USA
Rio Tinto Mining and Exploration Ltd.
Texas A & M University-USA
United Nations High Commission on Refugees (UNHCR)
United States Agency for International Development (USAID)
United States Department of State
University of Cambridge-UK
University of California at San Diego-USA
University of Sussex-UK
University of Vermont-USA
University of Wuerzburg-Germany
Wetlands International
World Bank
World Conservation Monitoring Centre (WCMC)
World Resources Institute (WRI)
World Wildlife Fund (WWF)
Zoological Museum University of Copenhagen-Denmark