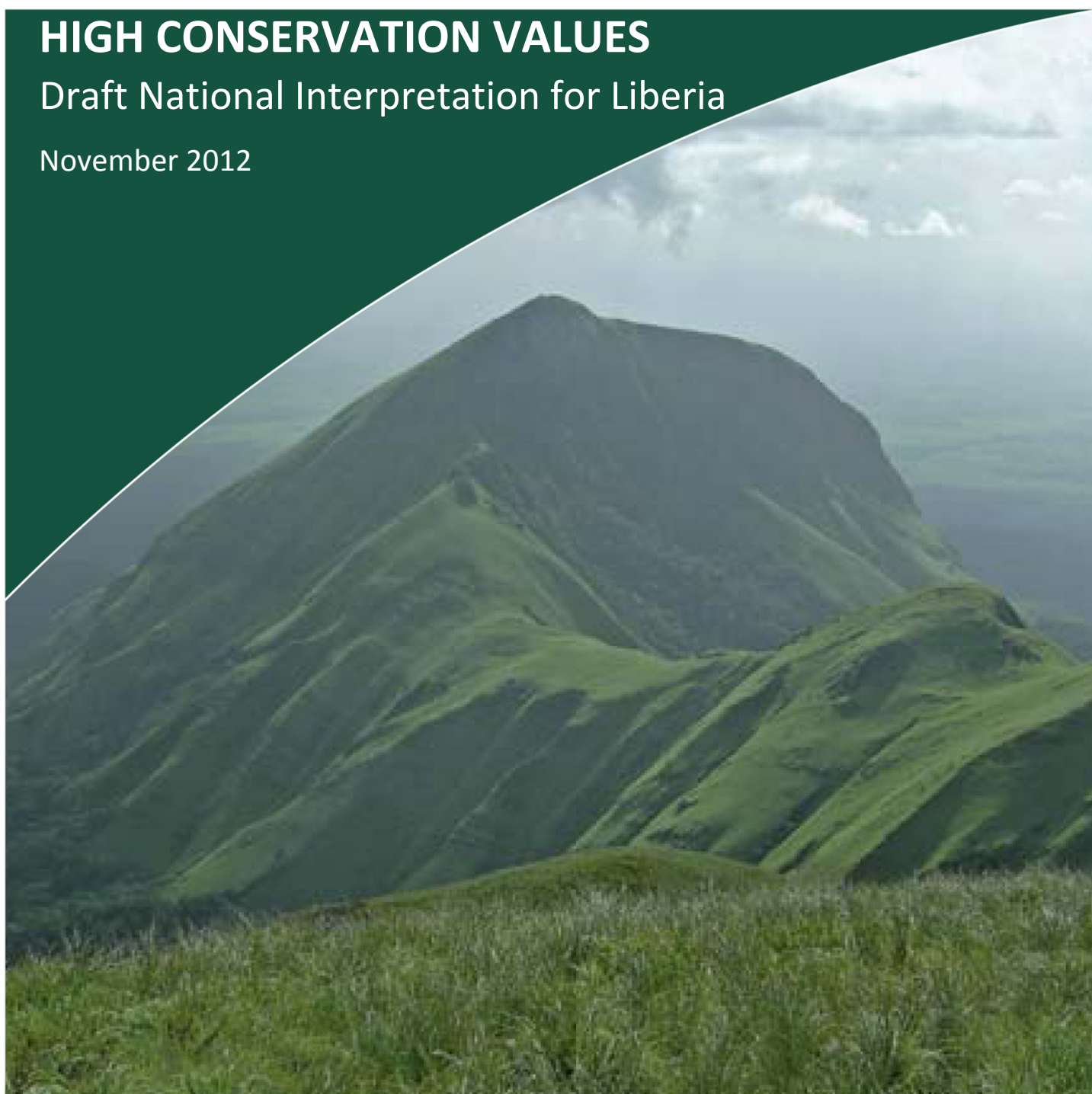


HIGH CONSERVATION VALUES

Draft National Interpretation for Liberia

November 2012



About The Proforest Initiative

The Proforest Initiative is an independent charitable organization with a global reach, supporting better management of the world's natural resources, with a focus on practical solutions. We provide support for the development of sustainability standards, safeguards and initiatives, work on research and policy development, and provide training and capacity building for a wide range of different stakeholders around the world. The Proforest Initiative is a registered charity in England and Wales (no. 1137523) and a company registered in England and Wales (no. 07293440).

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FFI protects threatened species and ecosystems worldwide, choosing solutions that are sustainable, based on sound science and take account of human needs. Operating in more than 40 countries worldwide – mainly in the developing world – FFI saves species from extinction and habitats from destruction, while improving the livelihoods of local people. Founded in 1903, FFI is the world's longest established international conservation body and a registered charity.

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Cover picture: Mount Nimba (@UNESCO/G.Debonnet)

Preface

Background to this document

In 2003, a global High Conservation Value (HCV) toolkit¹ was developed by Proforest² to support the practical implementation of the HCV concept. This global toolkit has been adapted to several countries with the development of National Interpretation Toolkits. In 2012, Flora and Fauna International (FFI), working with Proforest, began work to carry out a national interpretation of the HCV toolkit in Liberia, with support from the Biodiversity and Agricultural Commodities Programme, Sime Darby, and the Liberian National Initiative for Sustainable Oil Palm (LINSOP). This document presents the results of a national workshop held in Monrovia in July 2012 to develop a national interpretation of the global HCV toolkit. For each HCV category, information is presented on their generic definitions, national interpretations, identification and possible management priorities.

Potential for the High Conservation Value approach in Liberia

The HCV concept originates from the Forest Stewardship Council (FSC) principles for sustainable forest management (Principles 6 and 9), which present both environmental and social considerations for conservation and the sustainable use of natural resources. **The HCV approach allows for the management and maintenance of environmental, ecological, socio-economic and cultural values that are considered to be of outstanding significance at the global, national or regional scale.** While the HCV concept was designed in the context of forests, its application is now widely recognised for a range of ecosystems and in broader land use planning. The HCV approach has been adopted by sustainability schemes for timber, oil palm, soy and other commodities. In addition to certification standards, HCVs are also considered by some financial institutions, meaning that banks would avoid lending to companies who threaten or damage HCVs. This HCV toolkit is intended to serve as a technical support tool and to contribute to larger efforts towards sustainable natural resource management in Liberia.

Forests and land use in Liberia

The Republic of Liberia is situated on the West Coast of Africa and covers approximately 111,370 km² (dry land extent is 96,160 km²). There are four distinct topographical regions, including the Coastal Plains, an almost 560 km long unbroken sand strip, extending to up to 40 km inland, and rising to 30 m above sea level (a.s.l.). Next to the Coastal Plains lies a belt of inundated plateaux followed by a belt of highlands and rolling hills in the north and northwest. The Northern Highlands boast the highest elevation with Mount Wutivi, the highest point in Liberia, rising to 1,350 m a.s.l. There are two distinct blocks of forest remaining in Liberia, the forest block located in the southeast consists of evergreen species, while the northern block is mostly semi-deciduous.

Despite its small size, Liberia is a significant country in terms of biodiversity, where over 2,000 flowering plants (225 timber species), 600 bird species, 150 mammals and 75 reptiles have been identified. Liberia hosts the largest portion of the remaining Upper Guinean forests of West Africa, which are globally renowned for their high levels of endemism and species diversity. Over the years, these forests have been significantly

¹ <http://www.hcvnetwork.org/resources/global-hcv-toolkits>

² www.proforest.net

reduced in extent and coverage, making the remnant forests a priority for conservation efforts.

Forest cover and biodiversity in Liberia are at risk from population pressures and rapid development. Natural resource production is central to the Government of Liberia's economic growth strategy, and thus far an estimated 1.05 million hectares of remaining forest have been formally assigned as national logging concessions, 2.6 million hectares assigned to commercial operators under Private Use Permits (PUPs) and a further 0.5 million ha of land allocated for oil palm cultivation. Land clearance for commercial purposes may also be accompanied by unregulated timber extraction, the creation of unplanned road networks and human settlements encouraging further forest clearance and hunting. Other threats include soil erosion, mining, firewood gathering, charcoal production (due largely to the absence of public electricity), invasive species, inappropriate use of agrochemicals, lack of or insufficient public awareness and inadequate law enforcement.

Post-conflict forest conservation efforts

After 14 years of civil war, Liberia signed a peace agreement in 2003. The country's growth is dependent on the exploitation and management of its natural resources (timber, minerals, arable land), however this needs to be done in a sustainable manner. This represents a challenge, but also an opportunity for the development of sustainable livelihoods in Liberia. Liberia has ratified important environmental conventions and developed institutional and regulatory measures to protect the environment. There is a framework for the use of tools such as environmental and social impact assessments and potential for certification of natural resources management activities according to international sustainability standards for which the HCV concept is widely recognised (e.g. the Forest Stewardship Council and the Roundtable Sustainable Palm Oil (RSPO)).

Following the end of Liberia's civil war, the Liberia Forest Reassessment (LFR) project, implemented from 2002 by Flora and Fauna International (FFI), Conservation International (CI), Forestry Development Authority (FDA), the Environmental Protection Agency (EPA), and the Ministry of Planning and Economic Affairs had the central goal of promoting sustainable forest management and conservation of Liberia's biological diversity and improving overall environmental management. This work led to the 2006 National Forest Reform Law which adopted the '3Cs' concept (Commercial, Community & Conservation) to drive its reform. The 3C's were designed to promote integrated and balanced forestry practices for conservation, commerce and community in the long term, promoting the sustainable use of forest resources that recognizes and benefits local communities whilst respecting the need to protect the forest ecosystems.

In 1999 the Government, with the assistance of UNDP, established the National Environmental Commission of Liberia (NECOLIB) with a mandate to oversee all environmental activities in the country and to develop environmental policy and legislative arrangements. NECOLIB drafted the National Environmental Policy of Liberia, the Environment Protection and Management Law and the Environment Protection Agency Act. Liberia is party to a number of international conventions including the Convention on Biological Diversity, the Ramsar Convention on Wetlands, the Convention on International Trade in Endangered Species, etc.

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List of acronyms and abbreviations

a.s.l.	Above sea level
CBD	Convention on Biological Diversity
CI	Conservation International
CITES	Convention on Trade in Endangered Species
CR	Critically endangered (IUCN list)
EBA	Endemic Bird Area
EN	Endangered (IUCN list)
EPA	Environmental Protection Agency
FDA	Forest Department Authority
FFI	Flora and Fauna International
FPIC	Free Prior and Informed Consent
FSC	Forest Stewardship Council
ha	hectares
HCV	High Conservation Value
IBA	Important Bird Area
KBA	Key Biodiversity Area
km	kilometers
m	meters
IUCN	International Union for the Conservation of Nature
LFR	Liberia Forest Reassessment
LINSOP	Liberia Initiative for Sustainable Oil Palm
NECOLIB	National Environmental Commission of Liberia
NTFP	Non Timber Forest Products
PA	Protected area
PUP	Private Use Permits
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WCMC	World Conservation Monitoring Centre
WWF	World Wildlife Fund
ZSL	Zoological Society of London

1 HCV 1 Concentrations of biodiversity values

HCV 1 refers to areas that contain high concentrations of biodiversity values including endemic species, rare, threatened or endangered species that are significant at global, regional or national levels. HCV 1 also includes protected areas (PA), which often harbour important concentrations of biodiversity. Four sub-categories exist under HCV 1.

1.1 HCV 1.1 Protected Areas

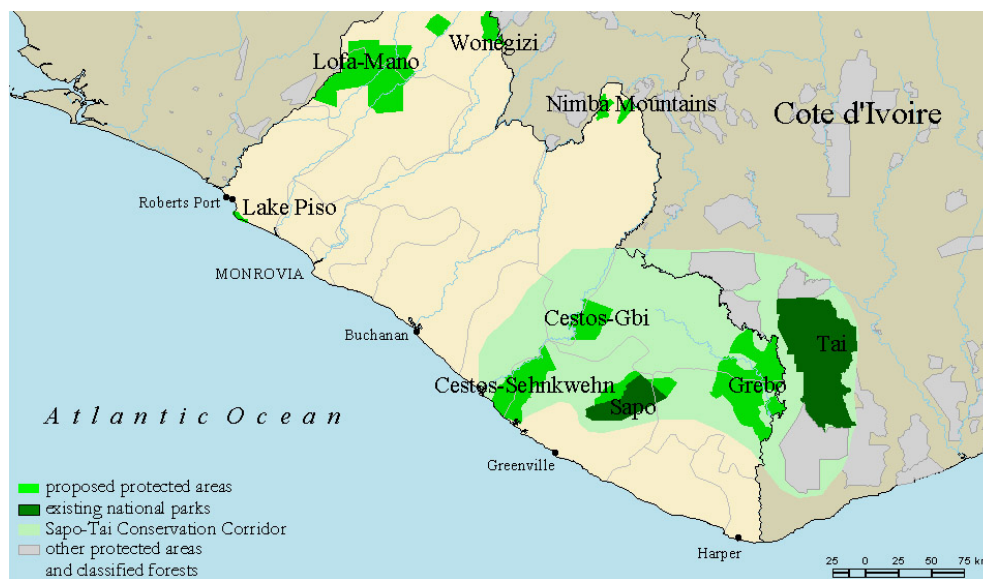
1.1.1 Definition

HCV 1.1 refers to areas that have been legally gazetted as protected areas and meet IUCN’s protected area categories I-V³.

1.1.2 Interpretation

The Liberian Protected Forest Areas Network Act identifies the following categories of PA in the country as requiring *preservation* or strict protection:

- National Parks
- Nature Reserves
- Strict Nature Reserves
- Cultural sites



In addition to the categories of PAs listed above, there are other forest reserve classifications under various management regimes for sustainable exploitation of natural resources. These include:

- National Forests
- Communal and Community Forests
- Multiple Sustainable Use Reserves

³ See Annex 1

Liberia has a target of achieving a PA network coverage of 1.5 million ha (representing 30% of the existing forest estate as of 2003) and a number of forested areas in the country are currently proposed for protection under the Protected Areas Network. However, as of July 2012 only 290,500 ha have legally been gazetted, with work underway to gazette more.

The working group considered the following categories of protected areas as HCV 1.1 within the Liberian context:

- National Parks IUCN Category II (e.g. Sapo National Park)
- Strict Nature Reserve IUCN Category IA
- Nature Reserve (e.g. East Nimba Reserve)
- Cultural Sites
- Game Reserves
- Wetlands of International Significance (RAMSAR sites) - the Liberian Government has ratified the RAMSAR convention and the following have been designated as Wetlands of International Significance as at August, 2012: Gbedin Wetlands, Kpatawee Wetlands, Lake Piso, Marshall Wetlands and Mesurado Wetlands.
- The Gola Transboundary Peace Park

Proposed Protected Areas: These may be considered as HCV 1.1 if:

- They meet IUCN categories I-V or are proposed RAMSAR Sites and
- The full extents of their boundaries have been established or demarcated, with the Free Prior and Informed Consent (FPIC) of all directly affected local communities have been obtained

Protected area categories in Liberia

The Liberia Protected Areas Network Act (2003) identifies several categories of Protected Areas under various management regimes. These include:

National Parks: An area of sufficient size to form a complete ecological unit, legally set aside for the preservation and enjoyment of features that have outstanding natural beauty, cultural or biological significance.

- Acts permitted in National Parks are limited to access for management, non-consumptive use, such as ecotourism, recreation and research

National Forests: An area that is legally set aside for sustainable regulated commercial forest product extraction, hunting and the preservation of essential environmental functions performed by the forest.

- Permitted acts include Class A mineral rights, access to licensed and managed commercial forest product extraction unless local restrictions are imposed by the FDA.

Nature Reserves: An area that does not represent a complete ecological unit, and has been legally set aside for the preservation and enjoyment of features that have outstanding natural beauty, cultural or biological significance, which may require some management intervention.

- Acts permitted in Nature Reserves are limited to access for management, non-consumptive use, such as ecotourism, recreation and research

Strict Nature Reserves: An area possessing outstanding or representative features, ecosystems and/or species legally set aside primarily for scientific research and/or environmental monitoring requiring strict protection and minimum intervention.

- Acts permitted in strict nature reserves are limited to management and research purposes only

Multiple Sustainable Use Reserves: An area set aside by regulation for a fixed period to allow sustainable use of forest products including subsistence and potentially licensed and community forestry schemes.

- Acts prohibited include farming and commercial timber extraction

Cultural Sites: An area set aside by regulation for the preservation and enjoyment of features with a local or national cultural significance.

- Acts prohibited include prospecting for mining, farming, hunting, timber or non-timber forest products extraction

Game Reserves: An area set aside by regulation for a fixed period, to immediately protect an important feature or to allow the recovery or growth of natural species.

- Acts prohibited include prospecting, mining, hunting, farming, timber and non-timber forest products extraction.

1.1.3 Identification of HCV 1.1

HCV 1.1 is considered to be present if:

- The management unit contains or forms part of an HCV 1.1 area defined above, or
- The management unit shares boundaries with any of the HCV 1.1 areas defined above, or
- Operational activities in the management unit can directly impact on HCV 1.1 areas in the landscape.

For a proposed PA, the identification process of HCV 1.1 should be done in consultation with relevant experts, local communities and other affected stakeholders.

1.1.4 Threats to protected areas

Protected areas form the backbone of conservation efforts in many countries, and play a useful role in protecting important rare, threatened, endangered and endemic species. In Liberia, the Protected Areas Network is known to protect populations of several endemic, rare, threatened or endangered species such as the Western Chimpanzee, Pygmy Hippopotamus and the Forest Elephant. The size of protected areas and the restriction of human activities in these areas help to ensure that representative populations of these species can thrive. There are however major threats to the effective management of protected areas. In Liberia, these threats include:

- Inadequate awareness of protected areas across different sectors (government bodies, communities, private sector companies logging, mining, etc.)
- Illegal contracting (including illegal mining and illegal logging in protected areas)
- Illegal and often non-sustainable hunting and poaching
- Encroachment due to agricultural expansion
- Inability to enforce laws related to hunting and logging
- Lack of clearly demarcated boundaries on the ground
- Overlapping objectives of government institutions
- Lack of community involvement in decision making and ownership, resulting in apathy towards management of protected areas

1.1.5 Management priorities

The categories of protected areas that are considered as HCV 1.1 benefit from complete protection and resource exploitation such as commercial logging, pit sawing, charcoal production, mining and hunting, farming, commercial and industrial activities of any scale are prohibited. To ensure a more effective protection of PAs, concessions granted by the government should be clearly demarcated. Ideally, the awarding of concessions and user-permit contracts or the development of national infrastructures shouldn't occur within the landscape in the vicinity of PAs. This would help avoid the increased human pressures on the PAs associated with infrastructural development. Alluvial mining should be restricted to avoid the pollution of water supplies.

As with extraction activities, categories of HCV1.1 must be set aside from conversion, and should be maintained in their present state. The proposed PAs identified as HCV 1.1 should be treated as established PAs. Areas designated as HCV 1.1 should be monitored

closely for encroachment and strict law enforcement should be carried out to prevent illegal contracting for mines and timber. It is recommended that buffer zones be established around the boundaries of HCV 1.1 areas to minimise the impacts on them from activities in the nearby landscape. The size of this buffer zone will vary depending on the nature of activities taking place in the landscape and the anticipated impacts. It is recommended that the minimum width of buffer to be established around HCV 1.1 areas should be 50m⁴. All commercial activities or large scale infrastructural activities planned to take place in the vicinity of HCV 1.1 areas should be risk assessed and their impacts on the HCVs thoroughly evaluated and mitigated. Livelihood activities for subsistence and subsistent income generation in local communities such as harvesting Non Timber Forest Products (NTFPs) should be regulated. Local community members should be included in the management and monitoring of National Parks in their area.

1.1.6 Information sources

The main sources of information include:

- The Forestry Development Authority Liberia is mandated to manage the protected area network in the country <http://www.fda.gov.lr/>
- Fauna and Flora International <http://www.fauna-flora.org/explore/liberia/>
- Conservation International http://www.conservation.org/where/africa_madagascar/liberia/pages/liberia.aspx
- Ministry of Land, Mines and Energy <http://www.molme.gov.lr/>
- Society for the Conservation of Nature in Liberia <http://www.scnlib.net/>
- BirdLife <http://www.birdlife.org/>
- UNEP-WCMC <http://www.unep-wcmc.org/>

1.2 HCV 1.2 Concentrations of rare, threatened or endangered species

1.2.1 Definition

HCV 1.2 refers to areas holding significant concentrations of rare, threatened or endangered plant or animal species.

1.2.2 Interpretation

The Protected Area network in Liberia is generally known to contain major concentrations of flora and fauna that are considered to be rare, threatened or endangered. The natural landscape in Liberia, including its forests, wetlands and other ecosystems are known to contain several species of conservation significance. Being one of the last remnants forests of the Upper Guinean High Forest region, the country is known to also host representative populations of species that typify this Eco-region⁵.

Outside of the Protected Area Network, there are also areas containing significant concentrations of rare, threatened and endangered species. For an area to be considered

⁴ From workshop discussion, Monrovia July 2012. This should be harmonized with national law.

⁵ Ecoregions (ecological region) cover relatively large areas of land or water, and contain characteristic, geographically distinct groups of natural communities and species.

as HCV 1.2, the rare, threatened or endangered species should be present in **outstanding** concentrations at the global, national or regional level.

HCV 1.2 may be considered present if the site is found to contain

- Viable populations of rare, threatened or endangered species belonging to any of the following IUCN categories⁶ CR (Critically Endangered), EN (Endangered), or CITES⁷ Appendix I and II or on the list of fully protected species under national regulations
- Any breeding pair of species considered to be of exceptional conservation significance at the local or national level by general stakeholder consensus. This will include species such as the pygmy hippo or
- Any species that is CR on the IUCN Red List. For Liberia, this will include species such as the Liberian Greenbul. For critically endangered species, each individual is extremely important as a potential progenitor of future generations, and hence the presence of an individual of this species will be considered as HCV 1.2.

1.2.3 Identification

All areas that contain rare, threatened or endangered species as defined above are considered as HCV 1.2. Additionally, the habitats needed for the protection of these species would also be considered as HCV 1.2. It is essential for assessments to also evaluate the potential impacts of current or planned activities on HCV 1.2 in the wider landscape, even in situations where the HCVs are not spatially located within the management unit. The HCV management area would typically include the entire area needed for the protection and management of the rare, threatened or endangered species.

A number of prioritisation schemes for biodiversity have been conducted in Liberia. These include Important Bird Areas (IBAs), Key Biodiversity Areas (KBAs) and other approaches to identify priority areas for the conservation of specific species. Areas that have been identified as priority for the conservation of various species of flora and fauna are very likely to contain HCV 1.2 and should be investigated for the presence of rare, threatened and endangered species meeting the definition of HCV 1.2 above. Additionally, other areas in the natural landscape could host some species of conservation significance and assessments have to evaluate the species present. The level of effort required should ideally be sufficient for the nature of the vegetation and species that are likely to be present in the area. For example, Liberia's south-eastern forest block is generally known as one of the highest priority sites for the conservation of the Western Chimpanzees, and assessment efforts in such an area would particularly put efforts towards assessing for the presence or potential presence of this species in the management unit.

⁶ See Annex 2

⁷ Convention on international trade in endangered species

Biodiversity of Liberia

Liberia has an exceptionally diverse assemblage of wildlife. There are approximately 150 mammal species, 600 bird species, 165 native fish species, 74 known reptiles and amphibians and over 1,000 described insect species.

Threatened fauna of Liberia

At present, there is no exhaustive list of endangered fauna in the country. The sections below present some readily available information. Assessments would typically crosscheck findings with the IUCN and CITES database as well as the list of protected species in the country.

Mammals

Threatened mammals of Liberia		
Common Name	Scientific Name	IUCN Threat Category
African Elephant	<i>Loxodonta africana</i>	VU
Chimpanzee	<i>Pan troglodytes</i>	EN
Diana Monkey	<i>Cercopithecus diana</i>	VU
Liberian Mongoose	<i>Liberiictis kuhni</i>	VU
Nimba Otter Shrew	<i>Micropotamogale lamottei</i>	EN
Red colubus	<i>Procolobus badius</i>	EN
Allens's round leaf Bat	<i>Hipposideros marisae</i>	VU
Jenkins Duiker	<i>Cephalophus jentinki</i>	EN
Pygmy Hippopotamus	<i>Choeropsis liberiensis</i>	EN
Sperm whales	<i>Physeter macrocephalus</i>	VU
West African Manatee	<i>Trichechus senegabnsis</i>	VU
Zebra Duiker	<i>Cephalophus zebra</i>	VU

Birds

Almost the whole of Liberia falls within the Upper Guinea forests Endemic Bird Area (EBA 0840) as designated by BirdLife International and contains a number of Important Bird Areas (IBAs). IBAs are areas recognised as globally important habitats for the conservation of bird populations.

Table 1: Important Bird Areas (IBA) in Liberia.

IBA Code	Site Name	Admin. Region (County)	Area (ha)
LR001	Wologizi Moutains	Lofa	20,000
LR002	Wenegizi Mountains	Lofa	20,235
LR003	Lofa-Mano	Lofa and Grand Cape Mount	210,650
LR004	Nimba Mountains	Nimba	20,240
LR005	Cape Mount	Grand Cape Mount	4,560
LR006	Zwedru	Grand Gedeh	15,000
LR007	Cestos-Senkwehn	Rivercess	146,800
LR008	Sapo	Sinoe	130,747
LR009	Cavalla River	Grand Gedeh	12,150

Bird Diversity

In total ca. 600 different species of birds have been recorded in the country, 184 species are characteristic of the A05 biome, and 125 species are Palearctic migrants, of which 21 species are of global conservation concern, and only 3 are not resident. *Circus macrourus*, *Falco naumanni* and *Gallinago media* are all rare or uncommon migrants from the Palearctic. The others (*Agelastes meleagrides*, *Scotopelia ussheri*, *Ceratogymna cylindricus*, *Ceratogymna elata*, *Melignomon eisentrauti*, *Campephaga lobara*, *Phyllastrephus baumanni*, *Phyllastrephus leucolepis*, *Bleda eximia*, *Criniger olivaceus*, *Malaconotus lagdeni*, *Illadopsis rufescens*, *Picathartes gymnocephalus*, *Prinia leontica*, *Bathmocercus cerviniventris*, *Melaenornis annamarulae*, *Malimbus ballmanni* and *Lamprotornis cupreocauda*) are all species of forest habitats, and fourteen are range-restricted.

Table 2: Threatened Bird Species in Liberia.

Scientific name	Common name	IUCN status
<i>Phyllastrephus leucolepis</i>	Liberian Greenbul	CR
<i>Malimbus ballmanni</i>	Gola Malimbe	EN
<i>Scotopelia ussheri</i>	Rufous Fishing Owl	EN
<i>Bleda eximius</i>	Green-tailed Bristlebill	VU
<i>Falco naumanni</i>	Lesser Kestrel	VU
<i>Melaenornis annamarulae</i>	Nimba Flycatcher	VU
<i>Prinia Leontica</i>	Sierra Leone Prinia	VU
<i>Lobotos Lobatus</i>	Western Wattled Cuckoo-Shrike	VU
<i>Agelastes meleagrides</i>	White-breasted Guineafowl	VU
<i>Picathartes gymnocephalus</i>	White-necked Picathartes	VU
<i>Criniger olivaceus</i>	Yellow-bearded Greenbul	VU

Liberian Greenbul (*Phyllastrephus leucolepis*) CR



The Liberian Greenbul (*Phyllastrephus leucolepis*) first described in 1985 and classified as critically endangered on the IUCN Red List, is a native Liberian rainforest species found in the transition zone between evergreen and semi-deciduous forests. It has only ever been recorded in two small patches of Upper Guinean forest 20 km north-west of Zwedru, near the Cavalla river in south-eastern Liberia. Its population is estimated at between 350-1500 individuals and likely decreasing because of habitat destruction and fragmentation.

(source: the African Bird Club www.africanbirdclub.org).

Plants

Over 2,000 plant species including 225 timber species have been recorded in Liberia.

Table 3 Threatened and endangered timber species

	Scientific name	Trade name
1	<i>Entandrophrama utilis</i>	Sipo
2	<i>Entandrophrama angolensis</i>	Tiama
3	<i>Entandrophrama candolei</i>	Kosipo
4	<i>Entadrophragma cylindricum</i>	Sapele
5	<i>Heritiera utilis</i>	Niangon
6	<i>Khaya enthoteca</i>	Khaya
7	<i>Lovoa trichiodes</i>	Lovoa/dibétou
8	<i>Tetraberlina tubmaniana</i>	Tet/sikon
9	<i>Tieghemella heckelli</i>	Makore
10	<i>Lophira alata</i>	Ekki/iron wood
11	<i>Triplochiton scleroxylon</i>	Wawa/obeche
12	<i>Piptadeniastrum africana</i>	Dahoma
13	<i>Chlorophora regia</i>	Iroko
14	<i>Aniegre robusta</i>	Aniegre
15	<i>Holea celiata</i>	Abura

(source: Liberia Indigenous Forum for the Environment, Report to IUCN-NL, under the project Threatened and Vulnerable Timber Species of Liberia, 2004).

1.2.4 Threats

Habitat destruction and fragmentation continues to threaten the rare, threatened and endangered species in the country. Agricultural expansion (both large scale and subsistence level) and numerous developmental projects have the potential of further degrading or destroying the habitats of species of conservation significance. Hunting and poaching continues to be an important source of protein for many rural and even urban dwellers in Liberia. The Liberian Hunting regulation offers varying levels of protection to several categories of wild animals in the country. There are however challenges with implementation.

1.2.5 Suggested management priorities

Management of HCV 1.2 would depend on the ecology and habitat requirements of the species. The size of management area required to protect big mammals would for instance vary from the area required to protect an endangered frog species. Management would typically consist of set-aside areas. The range of activities permitted in these set-aside areas would be determined based on the ecology of the species.

Additionally, management of HCV 1.2 would also involve:

- Engagement with local communities in the development of management regimes and in the enforcement of wildlife regulations as well as in the planning and management of natural resources.
- Support to alternative livelihood activities, especially in areas where hunting is a major livelihood activity or where hunted game forms a critical component of the diets of local communities

- Awareness rising on management prescriptions and benefits of conservation for local communities.
- Improved law enforcement

1.2.5.1 Information sources

- The IUCN's Red List database of threatened species
- Liberia's National Biodiversity Strategy and Action Plan
<http://www.cbd.int/doc/world/lr/lr-nbsap-01-p1-en.pdf>
- Liberia Forest Reassessment
http://www.esri.com/mapmuseum/mapbook_gallery/volume21/conservation4.html
- Biological Preliminary Assessments (Arcelor Mittal Liberia Limited)
- Liberia Protected Areas Network Strategic Plan
- Rapid Surveys Reports (FFI, CI, ZSL, etc.). Though there have been lessons learned from the involvement of FFI, CI, ZSL etc. in rapid ecosystem assessment across Liberia, there is not a harmonized process; these should serve as guidance.
- FDA National List of Protected Species
<http://www.fda.gov.lr/content.php?sub=conservation%20forestry&related=conservation%20forestry>
- Online databases such as www.earthsendangered.com

1.3 HCV 1.3 Concentrations of endemic species

1.3.1 Definition

HCV 1.3 refers to areas holding significant concentrations of endemic plant or animal species.

1.3.2 Interpretation and identification

Local, national or regional endemic species can merit HCV 1.3 status, especially when some of the species are at the limits of their range, or are of iconic significance. It is normal for any forest to contain some endemism, and most forests contain many species endemic to the continent; these do not however merit HCV 1.3 status.

An area will be considered as HCV 1.3 if it contains concentrations of endemic species. The level of endemism may be defined at various levels:

- **Nationally endemic species:** These are species that can be found only in Liberia. The presence of a breeding pair of any such fauna species or reproductive individuals of nationally endemic fauna species will warrant the designation as HCV 1.3.
- **Regionally endemic species:** This refers to species that are restricted in range to the Guineo-Congolese Forests. The presence of viable populations of such species would be considered as HCV
- **Species endemic to the continent of Africa:** These may be considered as HCV 1.3 if:
 - They are known to be critically endangered, endangered or vulnerable on the IUCN red list or

- The survival of the species across the continent is dependent on their populations in Liberia or
- Their populations in other African countries are decreasing or are not accorded adequate protection.

1.3.3 Identification

Conservation International (Meyers 2000, updated in 2010)⁸ published a list of endemic plant species of the world classified by biodiversity hotspots and 42% of the species listed as endemic to the Upper Guinean Forests are represented in Liberia. Liberia was also classified as an important country within World Wildlife Fund's (WWF) Global 200 Classification. Ecosystems containing an exceptional number of endemic species are very likely to be rare or threatened ecosystems, and can merit HCV 3 status as well as HCV 1.3. For example Mount Nimba, the Cestos-Senkwen Rivershed, Lofa-Mano and Sapo National Park areas contain many endemic species. These four areas figure among the 14 centres of plant endemism in the Upper Guinean biodiversity hotspot.

The Upper Guinea High Forests are also classified as an Endemic Bird Area by Birdlife International and serve as the home for several endemic and range restricted bird species. In Liberia at least one bird species is known to be endemic- the Liberian Greenbul (*Phylastrephus leucolepis*). Other known endemic species include the following:

Amphibians: The African True Toad (*Amietophrynus taiensis*), The Liberia Nimba Toad *Nimbaphrynoides liberiensis*, The Gbanga Forest Treefrog (*Leptopelis bequaerti*);

Reptile: Liberian Worm Snake (*Typhlops leucostictus*);

Crustaceans- Dwarf River Crab (*Liberonautes nanoides*), The GrandBassa River Crab (*Liberonautes grandbassa*) and The Lugbe River Crab (*Liberonautes lugbe*);

The Mollusc: *Bellamya liberiana*;

Additionally, there are several endemic plants including the endangered African Pine, *Tetraberlinia tubmaniana*.

Table 4: Species diversity, endemism and threat in Liberia

Class	Total Species	Total endemic	Total threatened
Amphibians	38	4	1
Plants	2,200	103	46
Mammals	193	n/a	17
Birds	581	1	22
Reptiles	67	2	2
Molluscs	No data	1	1
Other invertebrates	No data	No data	1
Total		111	90

Modified from: World Conservation Monitoring Centre, IUCN, FAO. NBSAP Liberia p.75

⁸ http://www.conservation.org/where/priority_areas/hotspots/hotspots_revisited/key_findings/Pages/endemic_plant_species.aspx

1.3.4 Threats

Habitat destruction and fragmentation continues to threaten the rare, threatened, endangered and endemic species in the country. Agricultural expansion (both large scale and subsistence level) and numerous developmental projects have the potential of further degrading or destroying the habitats of species of conservation significance. Hunting and poaching continues to be an important source of protein for many rural and even urban dwellers in Liberia. The Liberian Hunting regulation offers varying levels of protection to several categories of wild animals in the country. There are however challenges with implementation.

1.3.5 Suggested management priorities

Management of HCV 1.3 would depend on the ecology and habitat requirements of the species. The size of management area required to protect big mammals would for instance vary from the area required to protect an endangered frog species. Management would typically consist of set-aside areas. The range of activities permitted in these set-aside areas would be determined based on the ecology of the species.

Additionally, management of HCV 1.3 would also involve:

- Engagement with local communities in the development of management regimes and in the enforcement of wildlife regulations as well as in the planning and management of natural resources.
- Support to alternative livelihood activities, especially in areas where hunting is a major livelihood activity or where hunted game forms a critical component of the diets of local communities
- Awareness rising on management prescriptions and benefits of conservation for local communities.
- Improved law enforcement

1.4 HCV 1.4 Critical temporal concentrations of species

1.4.1 Definition

HCV 1.4 refers to seasonal or temporal concentration of species.

1.4.2 Interpretation

HCV 1.4 refers to sites that are used seasonally or temporally by major concentrations of species. This concentration may be due to the availability of feeding or breeding resources, shelter or refuge from adverse climatic events such as droughts and flooding. Examples of such sites will include critical breeding sites, migratory sites, migratory corridors and wintering sites. Additionally, areas that contain important feeding or watering resources at certain times of the year, when those resources are generally limited in the broader landscape are also considered as HCV 1.4.

1.4.3 Identification

An area that hosts seasonal or temporal concentrations of species will be considered as HCV 1.4, together with the total area that is necessary for ensuring that it continues to yield its benefits required by the concentrations of species. Hills and mountain ranges with their special vegetation are important migration and wintering sites of Palearctic migrants such as European Pied Flycatcher, *Ficedula hypoleuca*, Spotted Flycatcher, *Muscicapa*

stritata, Garden Warbler and Rock Thrushes found in rocky areas. Mangrove swamps are used as nesting ground for migratory birds in the dry season. There may also be a high concentration of fauna around water holes in the dry season, or on high elevations during floods. Phenological activities of a number of tree species can also lead to a temporal concentration of species. Flowering and fruiting of trees that leads to an increase in the population of butterflies, nectivorous birds and mammals within the forest. Common fruiting trees include: Niangon (*Heritiera utilis*), Iroko (*Chlorophora regia*), Walnut (*Cordia udilis*), Country spice (*Piper guinensis*), Fig trees (*Ficus* spp.), Monkey Apple, Bush Mango.

1.4.4 Information sources

- Birdlife International - Important Bird Areas
<http://www.birdlife.org/datazone/geomap.php?r=i&bbox=-150%20-50%20150%2080>
- Birdlife International - Endemic Bird Areas
<http://www.birdlife.org/datazone/geomap.php?r=e&bbox=-150%20-50%20150%2080>
- IUCN Red List <http://www.iucnredlist.org/>
- Conservation International
http://www.conservation.org/where/africa_madagascar/liberia/pages/liberia.aspx
- Society for the Conservation of Nature in Liberia <http://www.scnlib.net/>
- Forestry Development Authority Liberia <http://www.fda.gov.lr/>
- Fauna & Flora of Liberia <http://www.liberianfaunaflora.org/FFI/Home.aspx>
- Kew garden Liberian plant data base
<http://www.kew.org/science-research-data/directory/projects/LiberiaGISPlantCons.htm>
- Liberia's National Biodiversity Strategy and Action Plan
<http://www.cbd.int/doc/world/lr/lr-nbsap-01-p1-en.pdf>

2 HCV 2 Landscape-level ecosystems and mosaics

2.1.1 Definition

HCV 2 is defined to refer to a contiguous block of unfragmented large landscape level forest, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance

2.1.2 Interpretation

HCV 2 consists of natural ecosystems or ecosystem mosaics which are large in extent, form significant components of the landscape or are of significant importance at local, regional or national level, and which contain most of the naturally occurring species which would be expected to occur in that ecosystem or mosaic. It does not include man-made, converted, heavily degraded or fragmented ecosystems, nor those which have lost many of the species typical of such ecosystems in their natural state, nor those in which the distribution, abundance, regeneration and reproduction of the existing species no longer resembles natural patterns.

An area may be considered as HCV 2 if:

- it is at least 50,000 ha in size⁹ and
- consists of a contiguous block of intact and un-fragmented natural forest

It is rare to find a completely 'intact' forest that has not undergone any disturbance. Natural disturbances such as occasional low intensity wildfires or gap creation that are necessary for early successional species do not preclude an area from being considered as HCV 2. Additionally, large landscape level forests (greater than 50,000 ha) may still be considered as HCV 2, if they have undergone minimal low-intensity anthropogenic disturbance and where there continues to be viable populations of naturally occurring species in natural patterns of distribution

The aim of HCV 2 is to maintain the existence of large and exceptional tracts of relatively undisturbed forests and other associated ecosystem mosaics, with their assemblages of species. This is justified by a wide range of functions and values, including biodiversity, ecological process and landscape values, and associated concerns about their degradation and fragmentation. The focus is on maintaining the size, structure and connectivity of landscape elements, and on maintaining the presence of "viable populations in natural patterns".

2.1.3 Identification

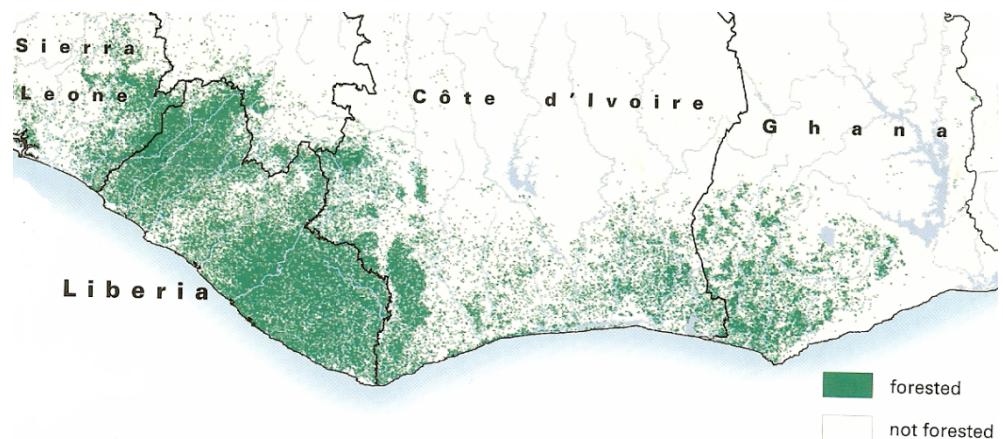


Figure 2: Forested cover in the area (source: FFI/Conservation International 2001).

Liberia contains most of what is left of the Upper Guinean Forest which extends from Eastern Sierra Leone to Eastern Togo, and is separated from the Lower Guinea Forest by the Dahomey Gap. It is estimated that over 40% of this high forest is concentrated in Liberia, whilst the rest is highly fragmented and spread around Cote D'Ivoire, Ghana and Sierra Leone. Within Liberia, the once continuous tracts of forests are now isolated from each other due to fragmentation caused largely by shifting cultivation and human settlements. Logging and road infrastructure have also contributed to the fragmentation. Due to this fragmentation there are two distinct blocks of forest remaining in Liberia: the evergreen forest block in the southeast and the semi-deciduous block in the northwest.

⁹ This is a generally accepted minimum size of HCV 2 and is used in several HCV National Interpretations. It is also used in the definition of Intact Forest Landscapes.

These two remaining dense forest areas are separated by a corridor extending from Monrovia to Nimba County and are further fragmented by the advance of shifting cultivation along existing roads and the construction of logging roads. That notwithstanding, there are blocks of large forests in these two major forest landscapes that could be considered as HCV 2.

2.1.4 Threats

In the north of the country, the Northern (Guinea) Savannah is extending into Lofa County. Due to extensive human settlements, there is now a distinct transition between the Grebo and Krahn-Bassa National Forest and the Grebo National Forest and another transition between Sapu National Park and Grebo National Forest, creating sub-blocks within the evergreen forest block. Along the border between Liberia and Ivory Coast there is also a degraded landscape between the Grebo National Forest in Liberia and the Tai National Forest in Ivory Coast, which were once connected but are now fragmented due to cross-border activities. According to the 2012 National Sustainable Development Report in Liberia, an estimated 192,000 ha of forest is lost annually to such threats as logging, shifting agriculture, illegal mining, charcoal production, and other commercial unsustainable forestry operations, all of which are driven by a constant population expansion.

3 HCV 3: Ecosystems and habitats

3.1.1 Definition

HCV 3 refers to ecosystems that are naturally rare or are threatened by present or future processes.

3.1.2 Interpretation

An area will be considered as HCV 3 if it contains an ecosystem:

- 1) That is naturally rare, where the climatic and geological conditions necessary for its development are limited in extent or
- 2) Whose extent has been significantly reduced by past processes or
- 3) Whose continued existence and integrity is so threatened by current and future processes

3.1.3 Identification

Though no detailed ecosystem classification for Liberia were available to the working group a number of land-use classification were considered. For example, Poorter *et al.* (2004) citing Sayer *et. al* (1992) provide some estimates of different forest types in Liberia and the Upper Guinean Forests of West Africa. The vegetation of Liberia is known to be dominated by lowland forests comprising of Wet Evergreen Forests in areas with rainfall above 2,000 mm and Moist Semi-deciduous forests in areas with rainfall between 1,600 mm and 2,000 mm. Montane forests and mangrove forests are particularly rare, whilst the area of swamp forests is almost negligible. Across the Upper Guinean forest region, montane forests and swamp forests are still very rare with only 0.4% of the forest area being represented each by montane forests and swamp forests. Though up to 8% of the forest areas in the region are represented by mangrove forests (being significant in Guinea and Guinea Bissau, the total areas of mangrove forests in Liberia is limited to only 0.01%. These areas are all considered rare, and identified as HCV 3 in this toolkit.

Forest type	Area (km ²)	% Forest area
Lowland forest	41,177	99.85%
Montane forest	55	0.13%
Mangrove forests	6	0.015%
Swamp forests	0	0%
Total Km²	41,238	100%

Country	Lowland forest (km ²)	Montane forest (km ²)	Mangrove forest (km ²)	Swamp forest (km ²)	Total (km ²)	%
Senegal	192	0	1,853	0	2,045	1.9
Gambia	0	0	497	0	497	0.5
Guinea Bissau	5,368	0	2,360	0	7,728	7.1
Guinea	4,482	210	2,936	0	7,655	7.0
Sierra Leone	3,925	81	1,015	43	5,064	4.6
Liberia	41,177	55	6	0	41,238	37.7
Cote D'Ivoire	26,890	138	29	407	27,464	25.1
Ghana	15,893	0	0	3	15,842	14.5
Togo	1360	0	0	0	1,360	1.2
Total km²	99,233	484	8,723	453	108,893	
Total %	90.8	0.4	8.0	0.4	100	

Montane forests

Across the Upper Guinean Forest zone, the mountains of the area represent a band of high biodiversity. This high richness may be partly explained by the high orographic rainfall. A number of species are restricted to these mountains because they are adapted to high altitude conditions such as daily fog and low temperatures (Poorter et al, 2004). In West Africa, montane forests are particularly rare compared to lowland forests or montane forests in South America or South East Asia. Hence montane forests in the region tend to have very small distribution and range. Additionally, some slow dispersing lowland forest species have had their glacial refuge on the relatively wet foothills on these mountains and now occur only in their surroundings. These mountains should thus receive extra attention as conservation priorities.

Vegetation on Mt. Nimba

Mount Nimba is one of the three centres of highest species endemism and diversity in the Upper Guinean Forest area, and is known to harbour not less than 13 endemic epiphytes as well as several endemic mammals, reptiles, birds and insects. Between 500 and 700 meters a.s.l., the slopes of Mount Nimba contain a large number of plant species, representing 82 genera of trees and shrubs, characterized in particular by *Piptadeniastrum*, *Heritiera*, and *Lophira*. Between 700 and 900 meters a.s.l. *Parinari* becomes increasingly common, as well as *Parkia* and associated species. There is an ecological boundary at about 850 meters from where a dense layer of clouds covers the slopes and ridges for most of the year, except during the dry months. Mount Nimba is an important bird area and a designated World Heritage Site.

Table 5 Some important mountains of Liberia (source: Field Survey, LIMINCO, 2002).

Mountain	Description	Location
Nimba Mountain	Second highest in Liberia. Exploited for iron ore. Source of St John, Cestos and Cavalla rivers	Nimba County, Northern Liberia
Wologisi Mountain	Unexploited	Lofa County, Southern Liberia
Bong Range	Exploited for iron ore	Margibi County, Southern Liberia
Gibi Mountain	Unexploited	Margibi County, Southern Liberia
Putu Mountain	Unexploited	Grand Gedeh County, Northern Liberia
Bomi Mountain	Exploited for iron ore	Bomi County, Northwestern Liberia
Wutivi Mountain	Highest in Liberia. Unexploited	Lofa County, Southern Liberia
Mano Mountain	Exploited	Cape Mount County, Western Liberia
Bea Mountain	Unexploited	Cape Mount County, Western Liberia
Kpo Range	Unexploited	Gbarpolu County, Northwestern Liberia
Wenegissi	Unexploited	Lofa County, Southern Liberia

Mangrove forests

Mangrove forests are naturally rare in the Upper Guinean forest region and their current distribution is under threat from various phenomena. Across the world, mangroves are considered to be among the world's most threatened ecosystems. In Liberia, the mangrove ecosystem stretches from Cape Mesurado to Cape Palmas at the edges of lagoons, river banks and river estuaries. Current threats to mangroves in the country include non-sustainable exploitation of wood and other non-wood products, construction of makeshift structures, drainage, overfishing, pollution and clearance. Due to their rarity and threats to their continued existence, mangroves are considered as HCV 3.

Other wetlands and seasonally inundated areas

All wetlands and inundated perform a critical function in serving as breeding and spawning grounds for diverse species, providing feeding and material resource to both animals and human, and performing critical functions in flood prevention, recharging underground aquifers. These include swamps, marshlands and bogs. The functions of these wetlands become even more critical if those areas are known to be hosting other HCVs. The toolkit considers all wetlands of international significance (RAMSAR sites) in Liberia as HCV 3. In addition wetlands that host or protect other HCVs would be considered as HCV 3. All other wetlands may be considered as HCV 3 based on consultations with experts and other stakeholders if they are found to be performing important ecological, environmental, socio-economic or cultural functions.

Table 6: Wetlands of International Significance in Liberia (August, 2012).

No	Wetland	Type	Size (ha)	Designated date
1	Lake Piso	Coastal Lacustrine	30,793	02-07-03
2	Marshall	Inland Riverine	n/a	24-08-06
3	Mesurado	Coastal	n/a	24-08-06
6	Cestos-Senkwehn	Inland Riverine	n/a	Proposed Nature reserve
7	Gbedin	Inland Swamp		24-08-06
8	Kpatawee	Inland Riverine	n/a	24-08-06

3.1.4 Threats

During the conflict in Liberia, the unsustainable exploitation of natural resources was a source of income used for the purchase of arms and general support of the civil war. After the conflict, this trend has continued, putting several ecosystems (some of which are already naturally rare) at risk from further degradation.

Table 7: Nature of the threats to the preservation of Liberian ecosystems.

Ecosystem	Naturally rare	Rare due to human activities	Type of human activities
Lagoons and Lakes	✓	✓	<ul style="list-style-type: none"> • Dumping • Sand mining
Waterfalls	✓		n/a
Wetlands		✓	<ul style="list-style-type: none"> • Cutting • Dumping • Pollution
Mangrove swamps	✓	✓	<ul style="list-style-type: none"> • Building of human settlements • Fuel wood collection
Gallery Forests		✓	<ul style="list-style-type: none"> • Grazing • Clearing
Montane Forests	✓	✓	<ul style="list-style-type: none"> • Building of human settlements • Mining
Primary Dense Tropical Rainforest		✓	<ul style="list-style-type: none"> • Agricultural concessions • Clearing

3.1.5 Management priorities

In addition to their biodiversity value¹⁰, the ecosystems listed in the previous subsections presents such values as:

- Water Catchment
- Food/Fuel
- Non Timber Forest Products (rattan, honey, medicinal plants, fruits, etc.)
- Cultural and traditional value (sacred sites)
- Storm and erosion barriers
- Carbon sequestration and climate regulation

To preserve these values, HCV 3 areas should be set aside from conversion to other land uses. Management should ensure that where these ecosystems continue to be threatened by human activities or natural processes including fire and flooding, appropriate steps are taken to protect them and ensure their continued existence. Where HCV 3 areas form part of the management unit or are directly affected by operational activities, management should also assess the capacity of HCV 3 areas to continually exist on a self-sustaining basis, and employ the necessary interventions where needed.

¹⁰ Forests with value related to biodiversity concentrations will automatically qualify for HCV 1.2.

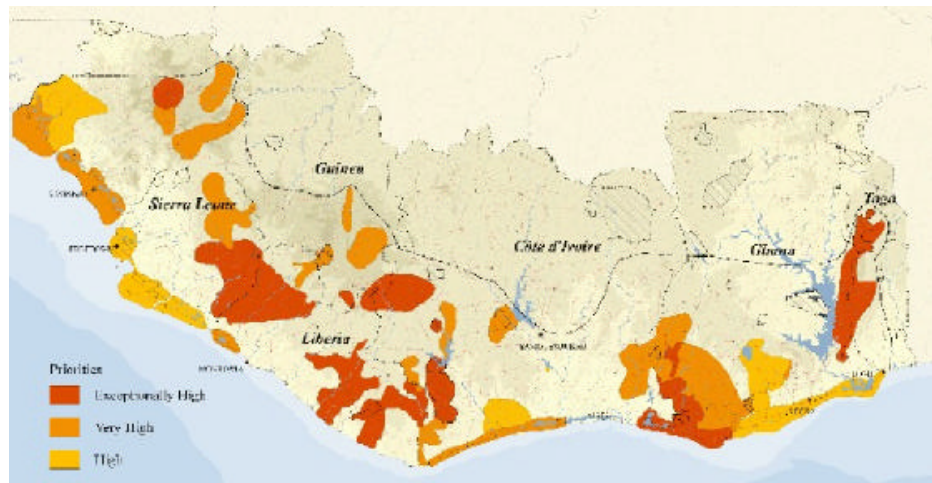


Figure 3: Conservation Priority Areas in the Upper Guinea Region (Conservation International, 2001).

3.1.6 Information sources

- Liberia's National Biodiversity Strategy and Action Plan <http://www.cbd.int/doc/world/lr/lr-nbsap-01-p1-en.pdf>
- Forestry Development Authority Liberia <http://www.fda.gov.lr/>
- Fauna & Flora of Liberia <http://www.liberianfaunaflora.org/FFI/Home.aspx>
- Conservation International http://www.conservation.org/where/africa_madagascar/liberia/pages/liberia.aspx
- Birdlife <http://www.birdlife.org/>
- Society for the Conservation of Nature in Liberia <http://www.scnlib.net/>
- UNDP <http://www.undp.org/content/undp/en/home.html>

4 HCV 4: Critical ecosystem services

HCV 4 refers to areas that perform critical environmental functions or provide basic services of nature, including the protection of water catchments, prevention of the spread of destructive wildfires and erosion control for vulnerable soils and slopes. These become critical when the absence or fragmentation of such vegetations would lead to severe, catastrophic or cumulative impacts. Three sub-categories of HCV 4 have been identified in the global HCV toolkit. The same categorisations were adopted for the Liberian toolkit.

4.1 HCV 4.1 Areas critical to water catchments

4.1.1 Definition

HCV 4.1 refers to areas that are critical for the protection of water catchments.

4.1.2 Interpretation

An area is considered as HCV 4.1 if it is critical for the maintenance of fragile or rare aquatic ecosystems, or if it is essential for the regulation of the flow of rivers or streams, preventing severe floods, or maintaining water quality.

4.1.3 Identification

A range of different areas are essential to maintain rare and fragile ecosystems, preventing flooding and protecting the ecological, physical and flow dynamics of watercourses in Liberia. The following categories of areas should be considered HCV 4.1:

Riparian and catchment vegetation

Riparian and catchment vegetation protect water quality by (i) trapping sediments and pollutants associated with run-off, (ii) helping recharge underground aquifers, (iii) dissipating stream energy during floods, and (iv) providing detritus for aquatic organisms. A reduction in the vegetation cover of riparian areas can thus lead to increased sedimentation and nutrient loading of streams which will result in a marked decrease in the quality of aquatic ecosystems.

Wetlands of international significance and/or critical local importance

The following items form a list, by no means exhaustive, of the potential functions wetland areas can fulfil:

- Water catchment protection
- Source of natural resources for human use (food, drinking water, bathing, fishing, agriculture, irrigation)
- Biodiversity protection
- Irrigation/Agriculture
- Site for cultural practices (rituals and sacrifice)
- Means of transportation (logs and human transport)
- Catchment of minerals for mining

These functions – and by way of consequence, the ecosystem associated - should be considered *critical* if their loss or destruction could result in catastrophic changes in people's livelihoods or the ecology of those ecosystems.

4.1.4 Threats

Areas critical for water catchments are mainly at risk from human activities generally related to agriculture or logging. These include water diversion, water pollution and vegetation clearing. If unregulated, diverting water for irrigation purposes has the potential to dry out or reduce the flow of waterways. The use of fertilisers or other industrial activities can lead to water pollution, which by reducing the quality of the water can have negative impacts on human health and biodiversity. The clearing of vegetation, either to transform the area into arable land, or as a result of logging activities can have potentially catastrophic consequences by modifying the landscape in the area itself but also further downstream. Cutting down riparian forests can increase the risk of flooding and/or droughts, as well as destroy important fishing ponds.

4.1.5 Management recommendations

Some guidance should be provided on harvesting practices and best practices for agricultural activities in the vicinity of rivers. These would typically include riparian buffer zones, defining management operations within the vicinity of water bodies and regulating effluent and water quality parameter.

4.1.6 Information sources

- EPA <http://epaliberia.org/>
- Land, Mines and Energy Department of hydrology
<http://www.molme.gov.lr/content.php?sub=71&related=1&res=71&third=71>
- Forestry Development Authority Liberia <http://www.fda.gov.lr/>
- Conservation International <http://www.conservation.org/Pages/default.aspx>
- Liberian Water and Sewer Corporation <http://lwsc.gov.lr/>
- Agriculture Sector Rehabilitation Project of the African Development Bank
- Local Communities

4.2 HCV 4.2: Areas critical for erosion control

4.2.1 Definition

An area is considered HCV 4.2 if it plays a critical role in preventing erosion, especially in areas where the consequences could potentially be severe in terms of loss of productive land or ecosystems, cause damage to property or loss of human life.

4.2.2 Interpretation

HCV 4.2 includes areas that are critical for the prevention of severe erosion and/or landslides and terrain instability that could endanger local communities, the resources they depend upon or other important ecosystems. These functions would be considered *critical* if their loss can result in catastrophic effects on lives, livelihoods or important natural areas. Critical consequences could include:

- Loss of soil where this would seriously affect ecosystem functions
- Landslides
- Wind erosion where this could blow topsoil away, destroy crops on farms and damage human settlements,
- Soil/silt/sediment accumulation where this would affect ecosystem function,
- Soil/silt/sediment accumulation where this would change the flow of waterways,
- All types of erosion when this threatens agriculture, human settlement, water catchment or water quality and biodiversity.

4.2.3 Identification

Vegetation on slopes or on fragile soils, forests located near human settlements and providing protection against wind erosion and surface runoff, or slope anchoring for the prevention of landslides could potentially be considered as HCV 4.2.

4.2.4 Management priorities

Management of HCV 4.2 would ensure that the vegetations that serve the purpose of preventing erosions and stabilising terrains are kept intact. In places where such vegetations have been removed, disturbed or broken, management will aim to restore

those vegetations. Operational activities on slopes should be regulated, and conversion of forest vegetations on steep slopes should be avoided. Depending on the nature of the soils and rainfall regimes, the threshold for steep slopes may vary from 20° to 35°. This should be in line with national and local regulations. Where no such regulations exist, this threshold should be determined in consultation with relevant experts and stakeholders.

It is essential to have clear policies and regulations in relation to management activities on areas with steep slopes. Forest strips should also be kept as protection from wind erosion around human settlements and arable land (especially freshly ploughed and unvegetated lands). An enforcement programme, including awareness raising and capacity building should be implemented by the relevant government agencies and companies.

4.2.5 Information sources

- Fauna and Flora International in Liberia
<http://www.liberianfaunaflora.org/FFI/Page.aspx?p=30&ix=3053&pid=3008&prcid=4&ppid=3008>
- EPA <http://epaliberia.org/>
- Land, Mines and Energy Department of hydrology
<http://www.molme.gov.lr/content.php?sub=71&related=1&res=71&third=71>
- Forestry Development Authority Liberia <http://www.fda.gov.lr/>
- Conservation International <http://www.conservation.org/Pages/default.aspx>

4.3 HCV 4.3: Areas critical for fire prevention

4.3.1 Definition

HCV 4.3 refers to areas that serve as a barrier to the spread of destructive wildfires that can pose a threat to human life, property, economic activity, threatened ecosystems, species or important ecological processes.

4.3.2 Interpretation

Vegetated areas that serve as a natural barrier against destructive wildfires in fire prone regions, or forests which help to protect natural vegetation, especially those with HCVs, against wildfires are all considered HCV 4.3.

4.3.3 Identification

The high rainfall levels and lush vegetation in most of the forest zones in Liberia imply a somewhat reduced risk of destructive fires. It has however been demonstrated that even moist forests can undergo fire events once they have undergone some level of degradation. While the risk of destructive wildfire is not a major threat in Liberia at the moment, it is known that some areas in the country (particularly, the north-western counties) are more prone to fire events during the dry season, when fires are not only more frequent, but can also spread more easily. Fires tend to be associated with plantations, or in areas where exotic trees have been introduced. There are regular fire outbreaks in Lofa County (North Liberia) during the dry season, and the coastal savannah areas are also prone to fires events.

4.3.4 Management priorities

In areas identified as being prone to fire events, steps management should aim at putting in place measure that prevent both the outbreak and spread of wildfires. Whereas good

Fire risks in Liberia

Though wildfires are not a major threat in most of Liberia's forests, there are still some areas that are subject to seasonal and regular burns.

All the savannahs along the coast, despite the rainfall, as well as the edaphic or man-made savannah further up-country are affected by fire every year, with the consequence that the forest, attacked at its edges, is gradually shrinking.

management practices that aim at reducing dry fuel loadings and sources of fire can be helpful in preventing fire events, it is also essential to encourage and or rehabilitate natural barriers that prevent the spread of destructive wildfires. These could be in the form of evergreen forest vegetations, wetlands or water-bodies. For forests serving as natural barriers, management would also aim at reducing fuel loadings and rehabilitating broken canopies that allow the growth of fast growing invasive species that may also be quick tinder for fire (e.g. *Chromolaena odorata*) Where fire is known to be a very serious risk to the existence of other HCV areas, management would also consider boosting the functionalities of these barriers by creating additional fire belts and green fire-breaks.

5 HCV 5: Basic needs of local communities

5.1.1 Definition

HCV 5 covers sites and resources fundamental for the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.

5.1.2 Interpretation

HCV 5 covers a wide variety of socioeconomic values, not specified in the definition, to be identified case by case. There is currently no limit to the scope of this value, provided that it has been identified by an appropriate system of engagement and consultation, and is recognised as fundamental for satisfying basic necessities. The designation and maintenance of an HCV 5 site or resource is only one element of what should be a wider rights-based approach to responsible land management, including appropriate consultative processes and negotiation.

5.1.3 Identification

The identification of a site or resource as HCV 5 depends on deciding whether it is **fundamental** for satisfying **basic necessities**. The decision must consider whether it is irreplaceable (i.e. whether there are affordable or readily accessible alternatives, not too difficult or expensive to obtain) and whether its loss or damage would cause serious suffering or prejudice to affected stakeholders. Local communities and/or indigenous peoples have the key role in proposing and identifying potential HCV 5, and geographers, local authorities and NGOs may provide helpful information.

Indicators of critical basic needs

Though all rural communities depend on resources from the natural landscape there are nevertheless instances where the dependence could be considered critical. The following are some indicators of situations where HCV might be present:

- Areas where human settlements are located close to the forest,
- Regions with high unemployment rates and lack of alternative livelihood options,
- Inaccessible/remote communities,
- Absence of livestock raising/animal husbandry
- Traditional practices of hunting/fishing
- Fishing (for internal consumption as well as for sale) in coastal forests.
- Traditional hunter-gatherer communities

The elements below provide examples of basic commodities.

- **Food** (animal protein, vegetables, palm nuts, kola, roots, water, snails, fish, etc.). Fishing is an important economic activity for a significant proportion of the Liberian population, especially along the coast and along the banks of major rivers. It is also the activity of artisan fishermen, whose harvest is predominantly subsistence-oriented.
- **Materials** (charcoal, firewood, building materials - round poles, thatch, rattan, canes, etc.)
- **Medicines** (ginger, country spice, Mimosa, alligator pepper, putter, lemongrass, bitter root, jondus, etc.)
- **Essential cash income** (hunting, rattan, fishing, handicraft, and other NTFP that are essential for the livelihoods of local communities)

The assessment of the presence of an HCV 5 has to be done in consultation with local communities and relevant stakeholders, and should aim to get the inputs of all constituencies and interest groups within the communities.

5.1.4 Management

The management of an area providing basic amenities to local populations has to be carefully agreed with the different organisations involved in order to share best practices and ensure the livelihood of communities is preserved. Previous HCV assessments in the area should be used as case studies and methodologies to gather data developed in order to respect local culture.

5.1.5 Information sources

- International Labour Organization (ILO) - Report on the Liberia Labour Force Survey 2010
http://www.ilo.org/global/statistics-and-databases/WCMS_156366/lang-en/index.htm
- Merlin <http://www.merlin.org.uk/liberia>
- FAO <http://www.fao.org/isfp/country-information/liberia/en/>
- Liberia Institute of Statistics and Geo-Information Services
<http://www.tlcafrica.com/lisgis/lisgis.htm>
- USAID http://transition.usaid.gov/locations/sub-saharan_africa/countries/liberia/index.html
- UNICEF <http://www.unicef.org/infobycountry/liberia.html>
- County development agenda
- Civil Society Organisations in Liberia
- Local Communities

6 HCV 6 Cultural values

6.1.1 Definition

HCV 6 refers to areas that are critical to the traditional cultural identity of local communities and includes areas of cultural, ecological, economic, religious or archaeological significance, identified in cooperation with such local communities.

6.1.2 Interpretation

An area will be considered as HCV 6 if it contains or provides values without which local communities will suffer an unacceptable socio-cultural or religious change and for which the community has no alternative.

6.1.3 Identification

In Liberia, as with other countries in the region, many local communities have strong cultural ties with forests and the natural landscape. Cultural and religious values associated with the forest could be both tangible such as herbs collected for ritual purposes and intangible, as with certain portions of the natural landscape being considered as the dwelling places of deities. Values that may be considered as HCV 6 could include:

- Ancestral burial grounds
- Sacred grooves
- Culturally protected forests such as the *Poro* bush, which is an area reserved by the *Poro* society for their cultural significance. The bush also serves as the meeting place of this secret society
- Shrines
- River deities
- Mountains, waterfalls and other relief features that are revered as deities
- Areas that are used for the performance of rituals; for example initiation rights for young women into the *Sande* society performed in 'secluded areas in the forest'
- Individual species of plants or animals that are culturally protected as totems
- Forest products that are collected and used for the performance of religious rituals. These could include raffia used in making apparels for traditional ceremonies and other parts of plants used for diverse purposes in traditional rituals.

Various ethnic groups have different traditional and cultural practices associated with the natural landscape. These practices vary from place to place, and even within the same county, there may be significant variations in cultural practices. The identification of HCV 6 should therefore be done in consultation with local communities and with local experts. Some basic understanding of the cultural context of the local communities is extremely crucial for the identification of HCV 6. In some places, cultural HCVs are by definition, secret phenomena and would not be easily disclosed to 'strangers'. The identification of HCV 6 may form part of a broader programme of engaging with local communities. Trust and local ownership are crucial in the identification and management of this category of HCV.

6.1.4 Management priorities

Clear identification and mapping of all HCVs are essential for their effective management. For HCV 6, delineation on the ground may not always be realistic in some cases. Once the full extent of these HCVs have been identified and mapped, their management is usually determined by the local communities. To ensure that the value continues to be of relevance to the local communities, it is good practice to allow continued access to these values, even in cases where they form part of the management unit.

6.1.5 Information sources

- Liberia Institute of Statistics and Geo-Information Services (LISGIS)
- Ministry of Internal Affairs,
- The National Traditional council of Liberia,
- Ministry of Information, Cultural Affairs and Tourism

7 Resources and references for Liberia

7.1 Landscape context

WWF Global 200 Eco-regions : Guinean Moist Forests - Ghana, Guinea, Cote d'Ivoire, Liberia, Sierra Leone, Togo CE

http://wwf.panda.org/about_our_earth/ecoregions/guinean_moist_forests.cfm

The Southern Upper Guinea ecoregion

http://www.feow.org/ecoregion_details.php?eco=512

Conservation International Hotspots of Biodiversity

http://www.conservation.org/where/priority_areas/hotspots/africa/Guinean-Forests-of-West-Africa/Pages/default.aspx

7.2 Biodiversity

The Zoological Society of Philadelphia. *Atlas of Liberia Mammals*

H. H. Johnston (1905) *Notes on the mammals and birds of Liberia*

Wulf Gatter (2000) *Birds of Liberia*

Kunkel (1963) *Trees of Liberia*

H. G. Voorhoeve (1979) *Liberian High Forest Trees*

Liberia GIS: National Plant Conservation Prioritisation

<http://www.kew.org/science-research-data/directory/projects/LiberiaGISPlantCons.htm>

Endangered species in Liberia: <http://Intreasures.com/liberiaa.html>

<http://www.earthsendangered.com/search-regions3.asp>

D. Russell and S. Sieber (2005) *Preliminary biodiversity and tropical forest conservation assessment*. USAID Liberia.

7.3 Forest management

Forestry Department Authority, Republic of Liberia. *National forestry policy and implementation strategy. Forestry for communities, commerce and conservation*. Monrovia 2006

<http://www.fao.org/forestry/16167-0dd77b0af6b1e94481d519ab979fd40db.pdf>

7.4 Coastal and marine environment

National report on the marine and coastal environment in Liberia. The Abidjan Convention. Environmental Protection Agency of Liberia. May 2007.

<http://www.unep.org/AbidjanConvention/docs/Liberia%20%20National%20Report%20of%20Marine%20&%20Coastal%20Env.pdf>

7.5 Institutional frameworks

Liberia Indigenous Forum for the Environment, Report to IUCN-NL Under the Project, threatened and vulnerable timber species of Liberia, 2004

Assessment of the legal, scientific, and institutional frameworks for biodiversity protection in the Republic of Liberia. Switzerland 2007 United Nations Environment Programme.

http://postconflict.unep.ch/publications/liberia_biodiversity.pdf

Liberia's National Biodiversity Strategy and Action Plan

<http://www.cbd.int/doc/world/lr/lr-nbsap-01-p1-en.pdf>

Annexes

Annex 1: IUCN protected area categories

No.	Name	Description
Ia	Strict nature reserve	Strictly protected areas set aside to protect biodiversity and also possibly geological/ geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values
Ib	Wilderness area	Usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition
II	National park	Large natural or near natural areas set aside to protect large-scale ecological processes, with species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities
III	Natural monument or feature	Areas set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove.
IV	Habitat/species management area	Areas that aim to protect particular species or habitats and where management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.
V	Protected landscape or seascape	An area where the interaction of people and nature over time has produced a distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values
VI	Protected areas with sustainable use of natural resources	Areas which conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They generally have most of the area in a natural condition, with a proportion under sustainable natural resource management.

Annex 2: Section II fully protected animals

Common Name	Scientific Name
West African Chimpanzee	<i>Pan troglodytes verus</i>
Black & White Colobus	<i>Colobus ploykomos</i>
Red Colobus	<i>Procolobus badius</i>
Olive Colobus	<i>Procolobus verus</i>
Diana Monkey	<i>Cercopithecus Diana Diana</i>
Mona Monkey	<i>Cercopithecus mona cambellii</i>
Lesser Spot-Nosed Monkey	<i>Cercopithecus (cephus) petaurista</i>
Sooty Mangabey	<i>Cercocebus atys</i>
Lesser Galago	<i>Galago senegalensis senegalensis</i>
Elephant	<i>Loxodonta africana cyclotis</i>
Bongo	<i>Boocerus euryceros</i>
Forest Buffalo	<i>Syncerus caffernanus</i>
Ogilby's Duiker	<i>Cephalophus ogilbyi</i>
Jentink's Duiker	<i>Cephalophus jentinki</i>
Yello-Backed Duiker	<i>Cephalophus silvicultor</i>
Zebra Duiker	<i>Ceophalophus zebra</i>
Royal Antelope	<i>Neotragus pygmaeus</i>
Water Chevrotain	<i>Hyemoschus aquaticus</i>
Red River Hog	<i>Potamochoerus porcus</i>
Giant Forest Hog	<i>Hylochoerus meinertzhageni</i>
Pygmy Hippopotamus	<i>Hexaprotodon liberiensis</i>
Leopard	<i>Panthera pardus</i>
Liberian Mongoose	<i>Liberiictis kuhni</i>
Golden Cat	<i>Felis aurata</i>
Giant Pangolin	<i>Smutsia gigantea</i>
Long-Tailed Pangolin	<i>Uromanis temminckii</i>
Tree Pangolin	<i>Phataginus tricuspis</i>
West African Manatee	<i>Trichechus senegalensis</i>
Nile Crocodile	<i>Crocodylus niloticus</i>

African Slender-Snouted Crocodile	<i>Crocodylus cataphractus</i>
African Dwarf Crocodile	<i>Ostelaemos tetraspis</i>
Rock Python	<i>Python sebae</i>
Ball Python	<i>Python raius</i>
Green Sea Turtle	<i>Chelonia mydas</i>
Loggerhead Turtle	<i>Caretta caretta</i>
(Osprey, Falcons, Buzzards, Etc)	
(Kestrels, Falcons, Etc.)	
All Hornbills	
All Turacos	
Bare-Headed Rockfowl	
Grey-Necked Rockfowl	
White Necked Rockfowl	
All Parrots	
White-Breasted Guineafowl	<i>Agelastes meleagrides</i>

Annex 3: Workshop participants List

HCV Draft National Interpretation (July 5 – 6, 2012)

No.	Name	Institution	Position
1.	Blamah S. Goll	Forestry Development Authority	Biodiversity Coordinator
2.	Daniel B.V. Wrayee	Ministry of Agriculture	Assistant Director
3.	McAlbert D. Donnie	Environmental Protection Agency	ESIA Analyst
4.	Francis W. Mwah	Ministry of Agriculture	Assistant Director
5.	Henri Harmon	Golden Veroleum Liberia	Vice President Govt. Affairs
6.	Cletus N. Togba	Forestry Development Authority	Socio-economic Manager
7.	Stephen S. Gongehn	Environmental Protection Agency	Environmental Inspector
8.	Mohd Zulkifli Mohd Isa	Sime Darby Plantation Liberia	Vice President Land Rec/Community
9.	Thomas Churchyard	Fauna & Flora International	Master Student (Cambridge)
10.	Andrew Kovarik	SHOPS	Chief of Party
11.	Morris Gontor	Environmental Protection Agency	Assistant Coordinator-ESIA
12.	Rowena Geddeh	Sustainable Development Institute	SMO
13.	Yanquoi Z. Dolo	Forestry Development Authority	Officer
14.	Jacob S. Dennis	Environmental Protection Agency	Environmental Inspector
15.	Nyenkan Eboko	Quantum Resources	CEO
16.	Ezekiel H. Kpehe	Environmental Protection Agency	Environmental Inspector
17.	Bill McGill Jones	Ministry of Planning and Economic Affairs	Program Assistant
18.	Bowen Saywon	Conservation International	
19.	Shadrach Kerwillain	Fauna & Flora International	REDD+ Outreach Coordinator
20.	Wilberforce W. Togba	AEI	Plantation Manager
21.	Micheal D. Titoe	Ministry of Agriculture	Director
22.	Benjamin Jlah	Land Commission	Program Officer
23.	David Parker	LPOIL/GSI	CEO
24.	Edwin Possah	GCM	

