



Assessment of the Legal, Scientific,
and Institutional Frameworks for
Biodiversity Protection in
the Republic of Liberia



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Introduction

Liberia has been lauded for its extensive and unique biodiversity, including the largest remaining tract of Upper Guinean Forest in West Africa and a stunningly diverse range of wildlife and plant species. In 1999, the West African Conservation Priority-Setting Exercise for the Upper Guinean Ecosystem identified Liberia as the top priority country for conservation efforts in humid West Africa.¹ However, the nation's biodiversity faces serious threats from a wide range of activities, including logging, fuelwood and charcoal production, subsistence agriculture, hunting, mining, and rubber plantations.² These threats are compounded by the subsistence struggles of a population that ranks as one of the most impoverished in the world, in part resulting from more than a decade of civil conflict. In short, Liberia poses unique challenges for the conservation of biodiversity.

This Assessment examines the current legal, scientific, and institutional frameworks for protecting biodiversity in Liberia. It focuses on the laws and regulations that directly address biodiversity,³ and is meant to assist Liberia in identifying opportunities for steps to further conserve and sustainably manage its biological resources. The assessment has been conducted against the backdrop of a broad legal reform effort now taking place in Liberia by the Liberia Forest Initiative ("LFI"), a partnership of government, international, and non-government organizations working to rehabilitate and reform Liberia's forestry sector and build capacity for the promotion of sustainable forest management.⁴ LFI was the driving force behind a new forestry law enacted in 2006, and is continuing to work on drafting the implementing forestry regulations, model contracts, codes, and manuals. This assessment discusses issues of overlapping concern with the LFI, such as protected areas, species protection, and trade in species.

The Environmental Law Institute ("ELI") produced this Assessment in partnership with the University of Oxford, Department of Plant Sciences, and the Sustainable Development Institute in Liberia. ELI first developed a list of biodiversity-related issues for further examination, including eight substantive and four cross-cutting issues, described below. Next,

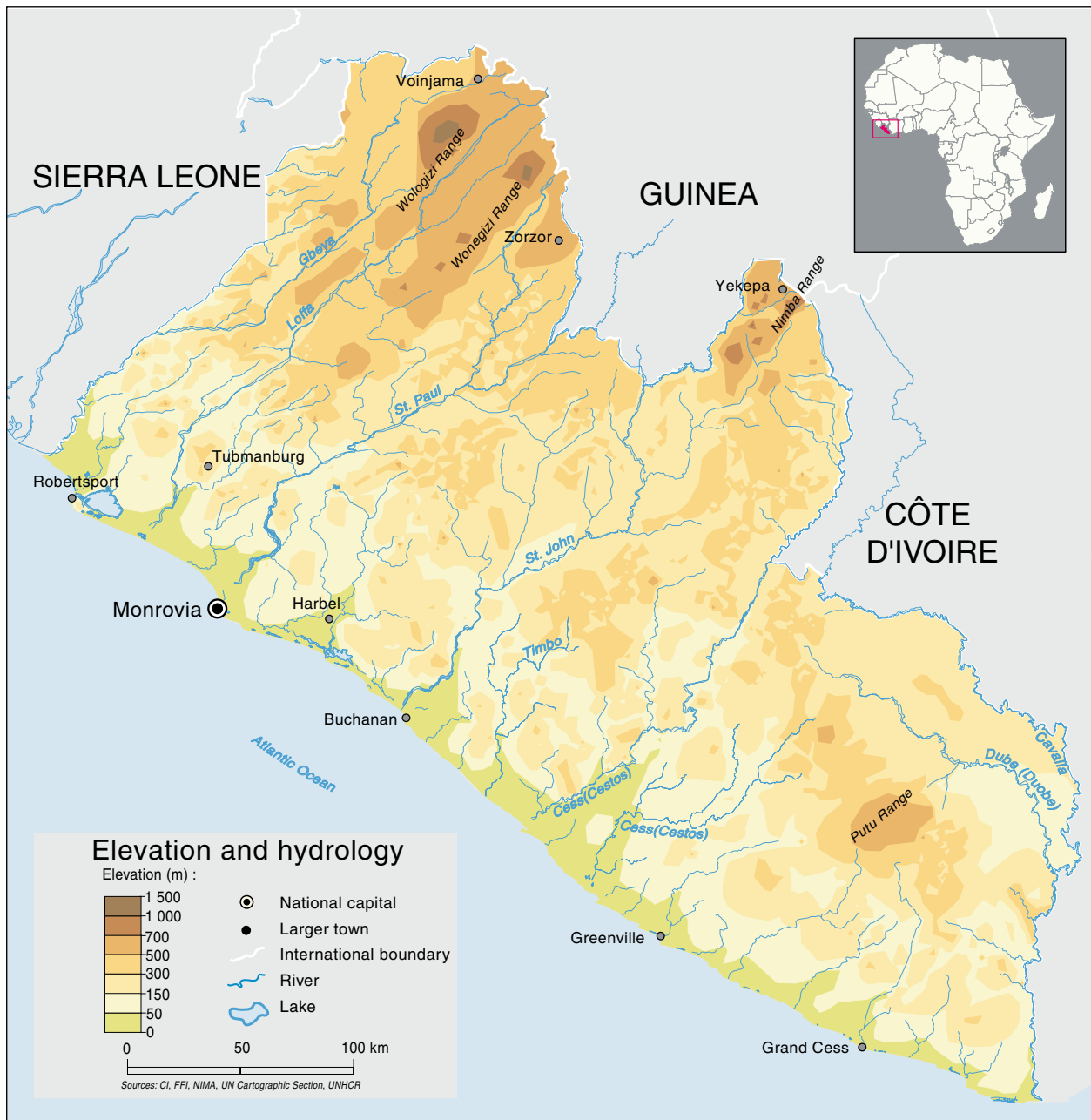
ELI worked with Paul Jarvan, a Liberian lawyer and ELI Visiting Scholar, to identify the relevant Liberian laws and regulations for analysis. In conducting its research, ELI began with a number of primary reports on Liberia, including the following:

- U.S. Forest Service, "USDA Forest Service Support to Wildlife Conservation in Liberia: Development of a Wildlife Management and Enforcement Strategy" (2005)
- Consultant's Report on the Review of Existing Environmental Legislation and Institutional Arrangements for the Management of the Environment and Natural Resources in Liberia (prepared for the National Environmental Commission of Liberia, with funding from the UN Environment Programme)
- Roland F. Dahn, "Report on Legislations and Institutions" (December 24, 2002)
- Anyaa Vohiri, "A Study to Clarify the Protected Forest Types Officially/Legally Recognized in Liberia," Report prepared for the Liberia Forest Reassessment Project (November 2002)
- S.S. Ajayi, Food and Agriculture Organization, Wildlife Conservation Issue Paper (February 2002)

ELI synthesized and added to this prior work with original research on Liberia's biodiversity laws, regulations, and institutions; an analysis of environmental information to support biodiversity conservation and management in Liberia by Dr. Nick Brown of Oxford; and interviews with seven Liberian government officials from four key Ministries conducted by Mr. Jarvan.

The Assessment comprises two parts. Part I examines the legal and scientific frameworks for protecting biodiversity in Liberia, viewed through eight substantive issues (protected areas, species protection, trade in species, invasive species, community-based natural resource management, inland and coastal water resources, biotechnology and biosafety, and access to genetic resources) and four cross-cutting institutional topics (environmental impact assessment, information and research, planning, and public participation). Several of the substantive issues are supplemented by an analysis of environmental information to support biodiversity conservation and management in

Elevation and Hydrology of Liberia



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Liberia, conducted by Oxford's Department of Plant Sciences. Part II of the Assessment considers the capacity of key government and non-government institutions to advance biodiversity protection in Liberia.⁵ The capacity analysis includes a snapshot of the primary institutions and organizations working

on biodiversity in Liberia, an examination of issues confronting Liberia's government institutions, and detailed profiles of four key government agencies. The Assessment concludes with five key recommendations for strengthening the protection of biodiversity in Liberia.

I. Analysis of Legal Framework

Introduction

Historically, most of Liberia's biodiversity-related laws were contained in a patchwork of national forestry legislation, consisting of a series of successive laws and regulations that repeal earlier ones wholly or in part. This temporal and substantive piecemeal approach generated significant confusion regarding the current state of the law. The agency responsible for implementing the forestry laws and regulations is the Forestry Development Authority ("FDA"). In 2003, Liberia also established the Environmental Protection Agency ("EPA"), which is charged with implementing a framework environmental law through the development of sector-specific laws, though this has not yet occurred. In addition, certain sectoral laws also address biodiversity conservation.⁶

This assessment focuses on the four main laws that currently address biodiversity issues:

- the 1976 FDA Act, as amended⁷
- the 2006 Forestry Law⁸
- the 2003 EPA Act⁹
- the 2003 Environment Protection and Management Law¹⁰

The first two of these laws are implemented by the FDA; the latter two by the EPA.

The 2006 Forestry Law, based on expert drafting guidance received from the LFI as part of a package of recommended reforms for Liberia's forest sector, is the latest in a series of laws addressing forestry and biodiversity issues in Liberia. The 2006 Law follows the 2000 Forestry Law, as amended,¹¹ and the 1988 Wildlife and National Parks Law.¹² Although the 2006 Law replaced the 2000 Law in its entirety, it left the earlier law's biodiversity-related portions substantially unchanged. As a result, much of the underlying analysis in this Assessment is directed more at the 2000 Law, the contents of which the 2006 Law largely preserved.

Between 1978 and 2001, long before the LFI instituted the present forest sector reforms, the FDA promulgated several regulations addressing biodiversity issues. The most substantial of these is Regulation No. 25, Revised Administrative Fees on Wildlife Conservation (June 9, 2000). Other regulations include No. 27, Reduction of Reforestation, Conservation, and Forest Research Fees Amending Regulation 23 (March 2001); No. 19, Sustainability of the Resource Base for Fuelwood and Charcoal Production (March 26, 1990); No. 18, Banning Export of Selected Species of Logs (March 20, 1990), and No. 17, Restricting the Export Size of Niangon Logs (Oct. 1, 1989).¹³

All of these regulations were enacted prior to the 2006 Forestry Law. A new draft set of ten core regulations under the 2006 Law, four of which are relevant to biodiversity generally, have undergone formal public review and comment and are expected to issue imminently. As many of these new proposed regulations contain sections recommending repeal of earlier regulations, in whole or in part, it is unclear how much one can rely on the substantive provisions of the earlier regulations while the forestry sector continues to undergo legal and regulatory reforms.

Together, the laws and regulations listed above provide for important elements of biodiversity conservation, including the creation of a network of protected forest areas; protection of wildlife, including regulation of the bushmeat trade; prevention of the introduction of invasive species; environmental impact assessment for a wide range of activities that may threaten biodiversity; environmental planning; and scientific research. However, significant gaps remain. Although the 2003 Environment Protection and Management Law sets forth broad criteria for the protection and sustainable use of biodiversity, directed at all agencies with sectoral environmental responsibilities, the lack of implementing regulations leaves this law largely inoperative. The laws also do not clarify the division of responsibility for biodiversity conservation among the various sectors. Weak on-the-ground enforcement and a lack of adequate scientific data about at-risk species and ecosystems further undermine the effectiveness of the existing laws and regulations.

Biodiversity Framework

(1) Protected Areas

Introduction. The World Conservation Union (IUCN) defines protected areas as “areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.”¹⁵ A comprehensive, well-managed system of protected areas can play a key role in the conservation and sustainable management of a country’s biological diversity.¹⁶ Protected areas may be divided into a number of different zones corresponding to various levels of use and protection, including a core area with extensive restrictions to protect critical habitat and species, and a buffer zone, surrounding the core zone, to allow for a broader range of uses while protecting the core zone from degradation. Protected areas can also be linked together via wildlife migration corridors that facilitate the safe movement of animals from one area to the next. Although Liberia’s laws provide for a protected forest areas network, stronger legal provisions and on-the-ground implementation are needed to bring it more fully into existence.

*International Law.*¹⁷ Liberia is party to several international environmental agreements that contain provisions on protected areas. Most prominently, Article 8 of the Convention on Biological Diversity¹⁸ (“Convention or CBD”) directs parties to establish a system of protected areas to conserve biodiversity; to develop guidelines for their selection, establishment, and management; and to promote the protection of ecosystems, habitats, and species. The Convention on Wetlands of International Importance¹⁹ (“Ramsar Convention”) requires signing parties to designate at least one national wetland for inclusion in a list of internationally important wetlands and to establish and manage nature reserves to promote the conservation of wetlands. The African Convention on the Conservation of Nature and Natural Resources²⁰ (“African Convention”) directs parties to maintain and extend existing conservation areas, and to assess the necessity of establishing additional conservation areas in order to protect representative ecosystems.

Finally, Article 4 of the United Nations Framework Convention on Climate Change²¹ (“UN Convention on Climate Change”) obligates parties to promote sustainable management of sinks and reservoirs for all greenhouse gases, including biomass, forests, and oceans as well as other terrestrial, coastal, and marine ecosystems. Protected forest areas can help provide such sinks and reservoirs.

Summary of Liberian Law

2006 Forestry Law. The primary legal authority for the establishment and management of protected areas in Liberia is Chapter 9 of the 2006 Forestry Law, which directs the FDA to establish a “Protected Forest Areas Network” encompassing at least 30% of Liberia’s existing forest area (Sec. 9.1(a)). This Network is composed of two categories of protected areas.²² Category I areas, which consist of National Forests, National Parks, Nature Reserves, and Strict Nature Reserves, must be established through legislation, following a proposal submitted by FDA to the President and forwarded by her to the Legislature (Sec. 9.2-9.5 & App. I). Category II areas, which are to serve as Conservation Corridors, consist of Game Reserves, Controlled Hunting Areas, Communal Forests, Buffer Zones, and other areas, and may be established through FDA regulation (Sec. 9.9).

As set forth in Section 1.3 (Definitions), the categories of protected areas are defined as follows:

Category I

National Forest. An area, set aside pursuant to Chapter 9 of this Law, for sustainable regulated commercial Forest Product extraction, Hunting, and the preservation of essential environmental functions performed by the forest.

National Park. An area of sufficient size to form a complete ecological unit, set aside pursuant to Chapter 9 of this Law, for the preservation and enjoyment of features that have outstanding natural beauty, or cultural or biological significance.

Nature Reserve. An area that does not represent a complete ecological unit, set aside pursuant to Chapter 9 of this Law, for the preservation and enjoyment of features that have outstanding natural beauty, or cultural or biological significance, and which may require some management intervention.

Strict Nature Reserve. An area possessing outstanding or representative features, ecosystems, or species, set aside pursuant to Chapter 9 of this Law, primarily for scientific research or environmental monitoring, and requiring strict protection and minimum intervention.

Category II

Buffer Zone. A transitional zone (such as a Communal Forest, Game Reserve, or Multiple Sustainable Use Reserve) surrounding a more strictly protected zone, intended for low-impact sustained human use to reduce the impact of outside human disturbance, to protect the boundaries from encroachment, and to preserve the natural state of the more strictly protected zone it surrounds.

Communal Forest. An area set aside by statute or regulation for the sustainable use of Forest Products by local communities or tribes on a non-commercial basis.²³

Game Reserve. An area, set aside pursuant to Chapter 9 of this Law, to protect an important feature for Wildlife or to allow the recovery or growth of Indigenous Species.

Multiple Sustainable Use Reserve. An area, set aside pursuant to Chapter 9 of this Law, to allow sustainable uses of Forest Resources, including subsistence uses.

Other

Cultural Site. An area, set aside pursuant to Chapter 9 of this Law, for the preservation and enjoyment of features with a local or national cultural significance.

The 2006 Forestry Law requires FDA to support forest conservation by undertaking research on socioeconomic conditions and wildlife distribution, habitat, and population, and to seek the advice of a Forestry Management Advisory Committee and others on management of the Protected Forest Areas Network (Sec. 9.1 (b) & (c)). The Law also directs FDA to prepare comprehensive management plans in accordance with international standards for National Forests, National Parks, Nature Reserves, and Strict Nature Reserves (Sec. 9.8). These plans

must be reviewed and republished every five years. While information about protected areas in Liberia is conflicting,²⁴ the Protected Forest Areas Network currently appears to consist of one national park (Sapo National Park),²⁵ one nature reserve (East Nimba Nature Reserve),²⁶ and fifteen national forests (Belle, East Nimba, Gibi, Gio, Gola, Grebo, Kpelle, Krahn Bassa, Lorma, National Forest Unknown No. 1 & 2, North Gio, North Lorma, West Nimba, and Yomo).²⁷ Liberia also contains between one and four "Nature Conservation Units,"²⁸ although it is unclear if this designation corresponds to any of the categories listed in the 2006 Forestry Law. In addition to the existing protected areas, a number of other areas have been proposed. These include Cestos-GBI, Cestos-Senkwen, Wologisi (or Wologezi), Wanegisi (or Wenegizi), Grebo, Nimba, and Cavalla.²⁹

2003 Environment Protection and Management Law. Although the 2006 Forestry Law serves as the main authority on protected areas, the 2003 Environment Protection and Management Law also contains some relevant provisions. Section 75 of that law gives the Environmental Protection Agency ("EPA") authority to declare rivers, lakes, or wetlands³⁰ as protected areas based on specified criteria. Section 79 gives EPA authority to declare any area of land, river, lake, wetland, or coastal zone as a "protected natural environment." Section 80 provides for the declaration, upon completion of an Environmental Impact Study by EPA, of "wildlife protected areas" (consisting of national parks, wildlife reserves, nature reserves, or any other areas) and "wildlife management areas" (consisting of wildlife sanctuaries, community wildlife areas, or any other areas),³¹ and charges EPA with prescribing measures necessary for wildlife management in these areas. Section 77 directs EPA to define and designate communal forests, and to issue guidelines for their management and use. This Section also authorizes EPA to declare "specially protected forest areas" in which human activity is prohibited. Under Section 84, EPA must promulgate regulations for the conservation of biological resources in-situ, including the selection and management of protected areas and the selection and management of buffer zones near protected areas. The law also provides authority for the protection of coastal zones and natural heritage sites (Secs. 82, 88).

Prohibitions and Restrictions. Section 9.10 of the 2006 Forestry Law, “Protected Forest Area Regulations and Prohibitions,” identifies various prohibited acts for each type of protected area. These prohibitions include:

Protected Area	Restrictions
Strict Nature Reserve	No activities other than conservation management and research (9.10(b)(i)).
National Park, Nature Reserve, Game Reserve	No prospecting, mining, farming, hunting, fishing, extraction of timber or non-timber forest products, or any other action except those for management or non-consumptive uses (9.10(b)(ii)).
Communal Forest	No prospecting, mining, farming, or commercial timber extraction (9.10(b)(iii)).
Cultural Sites	No prospecting, mining, farming, hunting, and timber or extraction of timber or non-timber forest products (9.10(b)(iv)).
National Forest ³²	No mineral prospecting, class B or C mining, or farming (9.10(b)(v)). ³³
Multiple Sustainable Use Reserves	No farming or commercial timber extraction (9.10(b)(vi)).

In addition, Section 16.3 prohibits unauthorized shifting cultivation and settlements in National Forests, National Parks, Nature Reserves, other Protected Areas, or Proposed Protected Areas, as well as on any other Forest Land designated as high forest in the National Forest Management Strategy. To enforce these prohibitions, Chapter 20 provides offenses and penalties, including fines of up to USD 25,000 and/or up to 12 months’ imprisonment for an offense (Sec. 20.7). Under Section 13 of the 1976 FDA Act, Forest Officers are authorized to arrest those who violate, or are reasonably suspected of violating, the laws or regulations relating to the conservation of forests.

As mentioned earlier, the Liberia Forest Initiative is currently working with FDA to draft a set of comprehensive implementing regulations under the 2006 Law. The new regulations are expected to replace, in whole or in large part, all pre-existing FDA regulations. Among the existing regulations, No. 25³⁴ specifies additional prohibitions (such as no hunting in National Parks, Nature Reserves, and National Forests) that overlap somewhat with those set forth in Section 9.10 of the 2006 Forestry Law. The regulation also specifies offenses and penalties for violations of the now-repealed 1988 Wildlife and National Parks Law (Sec. VI). In addition, Regulation No. 19 prohibits charcoal and fuelwood production in areas threatened with deforestation, including national forests, national parks, and other protected areas (Sec. 1).

Analysis

While Liberia’s existing legislation provides for the establishment and management of protected areas – including criteria for designation, the creation and periodic updating of management plans, and a list of prohibited activities and accompanying enforcement measures – this legislation could be strengthened through some important additions.³⁵

Protected Forest Areas Network. Although the 2000 Forestry Law (now 2006 Law) expanded the types of protected areas previously established under the repealed 1988 Wildlife and National Parks Law and strove to create a new network of protected forest areas, it remains unclear how such a system can be effectively implemented and enforced. The legislation currently does not provide a comprehensive plan for establishing a protected forest areas network, other than through a requirement that FDA undertake research and seek the advice of a Forest Management Advisory Committee on management of the Network and the conservation of Forest Resources within it.

Given the number of protected areas that FDA has been authorized to establish, and the goal of creating a comprehensive network of protected areas linked by conservation corridors, the Network would benefit from regulations detailing more clearly how this system will be set up, including how the FDA or other actors should make decisions regarding the delineation and classification of a particular natural area or ecosystem.³⁶ Such

regulations can help the agency establish a network of areas that fit together cohesively and that will accomplish the legislative goal of providing extensive forest and wildlife protection. A plan for organizing the protected areas network geographically would also help FDA enforce the prohibitions and restrictions applicable to the various types of protected zones.

Much of the reform work by the Liberia Forest Initiative has focused on establishing a participatory land-use planning process. Sections 4.4 and 4.5 of the 2006 Forestry Law established a baseline for land use planning, which is being developed further through community consultation. For additional analysis of the role of planning in biodiversity conservation, please see Section 11 of this analysis, *infra*. The Liberia Forest Reassessment Project also collected some baseline wildlife data pointing to the need for additional conservation areas.³⁷ The project's report identifies the Lofa-Kpelle-Gola-Mano forest area in northwest Liberia as the highest priority site for urgent wildlife conservation action.³⁸

In addition to working out the details for establishing a Protected Forest Areas Network, it will be critical for Liberia to consider the many non-forest ecosystems that should also be protected, such as marine ecosystems and coastal zones. Although Section 82 of the 2003 Environment Protection and Management Law gives EPA authority to declare coastal zones protected areas, none have yet been established. Recommended marine conservation areas (based on sea turtle surveys) include Borgor Point, Grandcress, Bafu Bay, and Karblakeihn.³⁹

Public Participation. Prior to the 2006 Forestry Law, the legal framework did not adequately provide for community input into the process for designating (and modifying the boundaries of) protected areas, through notice-and-comment provisions or other procedural vehicles. While significant community involvement can help prevent and mitigate the conflicts that often arise between communities and protected areas, the 2000 Forestry Law did not include specific provisions for such involvement, whether through notice and comment, provision of information, citizen appeals from government decisions, or any other means.⁴⁰

The 2006 Law did add some provisions on public participation generally, including a requirement for notice and comment on proposals to establish new protected areas (Section 9.3) as well as on new regulations (Section 19.2(a)). The Law also incorporated a chapter on Community Rights and Forest Management that requires FDA to grant forest use and management rights to local communities and build community capacity for sustainable forest management (Section 10.1(a)). In addition, Section 9.1(c) of the Law provides for consideration by the FDA of input from civil society representatives and others with respect to management of the Protected Forest Areas Network. Regulations implementing some of these provisions are expected to issue imminently.

In addition, the 2003 Environment Protection and Management Law allows for community participation in Environmental Impact Assessments for the establishment of national parks and game reserves, including notice and comment and the opportunity for a public hearing (Sections 17 and 18), though these allowances do not extend to other types of protected areas, or to the modification of their boundaries. For further analysis of the importance of involving local communities in protected area management, see the discussion under Section 5, Community-Based Natural Resource Management.

Management Plans. The 2006 Forestry Law provides little detail about the content of the management plans required under Section 9.8, except that they must comply with internationally accepted standards. In contrast, the now-repealed 1988 Wildlife and National Parks Law set forth a number of useful requirements for such plans. As provided under Section 15 of that law, these would include:

- (a) an inventory of wildlife, cultural, and related natural resources;
- (b) an assessment of wildlife population trends;
- (c) an assessment of wildlife interference and plans for controlling it;
- (d) a description of proposed activities for the management of wildlife resources, including restoration of depleted populations;
- (e) a description of proposed research activities;

- (f) a description of proposed infrastructural developments, including construction of visitor facilities, housing, administrative offices and other facilities;
- (g) plans for the development of national and international tourism;
- (h) plans for the administration of the National Park or Nature Reserve, including financial and staffing projections;
- (i) plans for the creation of buffer zones around the National Park or Nature Reserve;
- (j) plans for local involvement and public participation; and
- (k) maps of the National Park or Nature Reserve indicating proposed facilities.

Other desirable elements of a management plan would include a zoning system that provides for protection of ecosystems and species while allowing for some level of public visitation and sustainable resource use (partially addressed by item (i), above); restrictions on the number of allowable visitors; and a requirement for documentation of any need to modify protected area boundaries.⁴¹ These and other elements, of course, would vary according to the type of protected area being established—for example, whether it is a National Park or a Controlled Hunting Area. In any event, incorporating more requirements for management plans can help ensure that protected areas are effectively maintained.

Forests. Historically, Liberia's forests have been valued more for their commercial use than for their conservation potential, due in part to their generation of income for impoverished residents – and, more recently, as a resource to be exploited as a means of fueling conflict. With the recognition that Liberia harbors one of the largest stands of Upper Guinean rainforest has come renewed commitment to protecting its forest areas from unsustainable use. As commentators have noted, the current challenge confronting Liberia is how to balance commercial uses, subsistence uses, and forest protection.⁴² In February 2006, the President of Liberia cancelled all existing forest concessions, pending a full review and the implementation of reform measures by the Forest Reform Monitoring Committee.⁴³ The Liberia

Forest Initiative is recommending a broad reform package for Liberia's forest sector, including the already-passed 2006 Forestry Law and upcoming implementing regulations. With additional forest reforms expected, the legislative framework is likely to continue to change.

Sacred Forests. Although the 2006 Forestry Law does not mention traditional sacred forests, greater attention might be paid to the potential role of these forests in promoting biodiversity conservation. Sacred forests, which are found in a number of African communities, hold ecological, cultural, and historic value.⁴⁴ While sacred forests encompass ecological areas that are smaller and more isolated than those found in protected areas, they enjoy a significant level of protection through a network of local customs and beliefs that serve to monitor their use.⁴⁵ To further protect such forests, Liberia could include sacred forests in the cultural site designation as a Category II protected area.

Inconsistencies. Because Regulation 25 was apparently promulgated under the 1988 Wildlife and National Parks Law, and does not appear to take the 2000 Forestry Law into account, it contains provisions on protected areas, restrictions, and penalties that are inconsistent with those provided in the 2006 Forestry Law. For instance, the regulation only recognizes four types of protected areas (National Parks, Nature Reserves, Game Reserves, and National Forests, per Section I(i)); forbids hunting and not other activities such as prospecting, mining, and farming (Section III); and imposes penalties for violations of protected area restrictions that do not even appear in the 2006 Law, such as the possession of weapons (Section VI).

In addition, Section 80 of the 2003 Environment Protection and Management Law introduces two categories of protected areas—wildlife protected areas and wildlife management areas—beyond the existing classification scheme provided under the 2006 Forestry Law. These two terms are defined to include protected areas that, for the most part, are not found under the 2006 Law. Since the Environment Protection and Management Law does not define these sub-areas (including wildlife reserves, nature reserves, wildlife sanctuaries, and community wildlife areas), it is unclear how they will fit within the existing protected forest areas network.

Prohibitions. The restrictions listed in Section 9.10 of the 2006 Forestry Law (e.g. no prospecting, mining, farming, hunting, fishing, timber extraction, or non-timber forest product extraction) are worded much less extensively than those contained in the repealed 1988 Wildlife and National Parks Law. Even though it recognized fewer types of protected areas, the 1988 Law imposed significantly more detailed prohibitions on activities in National Parks and Nature Reserves. These provisions included restrictions on:

- (a) cutting, clearing, burning or otherwise damaging or removing any tree, bush, plant or other vegetation;
- (b) residing on, occupying, or cultivating any land or plant or otherwise growing or harvesting any crops;
- (c) constructing or occupying any house, shelter or other structure;
- (d) mining, quarrying, drilling, or removing any minerals, stone, gravel, earth or other substances or prospecting for such substances;
- (e) introducing any cattle or other domestic animal or permitting any cattle or domestic animal to stray;
- (f) obstructing, polluting, or diverting any river, lake, or other body of water;
- (g) removing archaeological or cultural materials;
- (h) placing, erecting, moving, destroying, or interfering with any notice, fence, gate, boundary marker, or other such marker, or destroying or defacing any object; and
- (i) performing any act or engaging in any activity likely to destroy, endanger or disturb wildlife.

As FDA has not yet promulgated updated regulations corresponding to the 2006 Forestry Law, widespread gaps in the current prohibitions applicable to protected areas remain, and should be filled.

Other Provisions. The 2006 Forestry Law contains no explicit requirement of periodic review of the Protected Forest Areas Network by FDA (or a new governing agency) or documentation of those findings in a report, with an eye towards consistency of management plans, protection of Conservation

Corridors, and management of park resources.⁴⁶ Filling this gap would help FDA strengthen and expand the Network. Other gaps include a lack of specific enforcement mechanisms (such as funding provisions for equipment and staff), the authority to provide interim protection to an area under survey or consideration as a protected area,⁴⁷ and the establishment of entry fees for certain protected areas, such as National Parks, which can be an important source of income for enforcement and management purposes.⁴⁸ While there is some indication that fees are collected from visitors entering Sapo National Park,⁴⁹ this requirement is not spelled out in the 2006 Forestry Law. Finally, the lack of detailed regulations to flesh out other protected area provisions of the 2006 Law and the 2003 Environment Protection and Management Law remain a significant gap in their implementation and enforcement.

Legal Framework. Apart from these recommended additions to existing laws, Liberia might consider restructuring its overall legal framework governing protected areas. The placement of protected area provisions within the 2006 Forestry Law, which primarily addresses the use and management of Liberia's forest resources, may create a conflict between the competing goals of forest resource extraction and conservation. To prevent such a conflict, one possibility would be for Liberia to create a new agency, or at least a new division within the FDA, to develop and oversee the system of protected areas, through an independent law that would consolidate the protected area provisions in the 2006 Forestry Law, 2003 Environment Protection and Management Law, FDA regulations, and individual acts creating the Sapo National Park, East Nimba Nature Reserve, and any future protected areas.⁵⁰

In conclusion, the effectiveness of the Protected Forest Areas Network would be strengthened through integration of the 2003 framework Environment Protection and Management Law with existing protected area legislation; the development of stronger, more targeted laws and regulations governing protected areas; and the dedication of resources (such as may exist) to manage protected areas while continuing to provide oversight of the forest extraction industry. Protection efforts would also be enhanced through

the inclusion of non-forest ecosystems, such as coastal zones, in the protected area network. The Proposed National Wildlife and Protected Areas Law of Liberia put forth by the U.S. Forest Service in its 2005 Report presents an example of legislation that might accomplish some of these goals.⁵¹

Protected Areas: Environmental Information Biodiversity Conservation

Key Data Requirements

Conservation objectives typically form a hierarchical series in which local and regional objectives are nested within broader national and even international aims. Not all objectives are compatible and some local areas may be better suited to meeting one goal rather than another. A national land-use zoning plan is therefore a valuable step towards ensuring that a protected areas network is comprehensive, efficient and effective. A zoning plan has three mutually interdependent components: (i) the identification of conservation goals (what should be protected, why it should be protected, how much should be protected and by when), (ii) an inventory of what there is to protect; and (iii) a review of existing protection and key drivers of land-use change, since conservation action is constrained by past resource losses and prioritized by threats to remaining resources. Each step in this systematic conservation planning process⁵² has its own data requirements:

1. Identification of conservation goals. There are a number of potential targets for conservation action:

a. **Species:** These may include species that are globally or nationally rare or threatened. Because of its isolated position, the Upper Guinean forest is a distinct biogeographic region that contains a large number of endemic species of global conservation importance. The preservation of highly interactive species, the absence of which leads to significant changes in the ecosystem,⁵³ is also an important conservation target. These might include important seed dispersers, keystone predators, or structural modifiers. Adequate protection of key species such as

forest elephants (*Loxodonta africana cyclotis*), pygmy hippos (*Hexaprotodon liberiensis*), and Diana monkeys (*Cercopithecus diana diana*) requires detailed understanding of their ecology; specifically their habitat requirements and minimum viable population size.

b. **Ecosystems or habitats:** Ecosystems may in themselves be rare or threatened, or they may provide important habitat for key species. Liberia, for example, contains a large proportion of surviving Upper Guinean rainforest in two large blocks. Ecosystem-based 'coarse filter' approaches to conservation planning are frequently used in response to a lack of knowledge about the distribution of the biota.

c. **Sites:** Specific geographic locations may have a cultural, symbolic, or social significance that warrants special protection.

d. **Natural resource use values:** Natural resources can be a major financial asset that can be used most beneficially by planning sustainable exploitation. The planning process should seek to minimize conflicts with other conservation objectives. Different stakeholder groups often have very different resource use objectives and the failure to take these competing demands into account can be an important source of conflict.

e. **Ecosystem function:** Natural assemblages (or communities) process resources, affect the physical environment, and interact with other species in ways that can be beneficial to human societies. Examples include the protection provided by pristine forest to water catchment areas and the nursery function of mangrove forests for coastal fisheries.

2. Compilation of biodiversity data. This requires the collation of existing species data for which location records are available, or, when existing data are inadequate, a systematic inventory of key taxa over an appropriate sampling framework. This is the component in the systematic conservation planning process that is most likely to be missing. Very few countries have biodiversity data that is comprehensive both taxonomically and geographically. This has often led to the ad

hoc declaration of reserves in response to threats or opportunities. This approach is inefficient since it does not ensure that the protected areas meet important conservation targets. A pragmatic solution would be to use surrogate data such as the distribution of indicator taxa or of key ecosystem types.

3. Review of existing conservation areas and key drivers of land-use change. Gap analysis is a method of identifying gaps in the existing network of conservation areas.⁵⁴ It allows those species and ecosystems that are not adequately represented to be prioritized for protection. Spatially explicit land-use change modeling is a valuable technique for predicting future pressures on natural ecosystems and resources. It enables the comparison of different planning scenarios and allows planners to test their understanding of the key drivers of future land-use change.⁵⁵

Existing Data

Natural communities

There has been no recent detailed assessment of the distribution or composition of natural communities in Liberia. Historical surveys of the forests of Liberia focused primarily on their timber potential. Their value for biodiversity management is therefore limited and given the rapid rates of deforestation over the last three decades, they are inadequate for conservation management planning. A number of initiatives have been undertaken in order to remedy this situation. The Liberia Forest Reassessment Project, funded jointly by the European Union and Conservation International's Critical Ecosystem Partnership Fund, compiled a layered analytical GIS map of Liberia's tropical forest and carried out field surveys of fauna and botanical species from 2001-2004. The Forestry Development Authority has worked in collaboration with Conservation International and Fauna and Flora International to create a detailed and up-to-date map of forest cover. This information is a fundamental precursor to any management planning. An important next step is to add detailed species inventory data to this forest cover map. Serious consideration should be given to increasing the resources given to biodiversity inventory.

There appears to be no parallel project to map and inventory non-forest habitats. Marine, coastal, and

wetland habitats are a high priority because of their importance for threatened migratory species. Mountain ecosystems have been almost totally neglected.

The 1999 West African Conservation Priority-Setting Exercise, funded by the Global Environment Facility, used a workshop approach to identify priority areas for conservation based on expert assessment of a wide range of biological and socioeconomic values. The workshop identified a number of key areas in Liberia.⁵⁶ The Liberia Forest Reassessment Project's work will enable those that are forest areas to be demarcated with greater precision.

Local checklists

A significant constraint on systematic conservation planning in Liberia is the lack of up-to-date species checklists for a wide range of sites across the country. This means that very little is known about the distribution of most organisms. For many major groups of organisms, there is a wealth of historic data, but these are from a very restricted range of (easily accessible) sites. The distribution of many species can be predicted from the distribution of forest types and knowledge of their composition from other parts of the region. For example, the distribution and ecological profiles of 280 rare plants and 56 timber trees has recently been plotted across the Upper Guinean forests.⁵⁷ However, species in large areas of Liberia have never been collected in a systematic fashion and it is extremely likely that endemic species of very restricted distribution will be discovered. Although Liberia contains the largest surviving block of Upper Guinean rainforest, it is also the least botanically explored country in West Africa.

An annotated checklist and distribution maps for 400 resident bird species and regular migrants to Liberia was published in 1998.⁵⁸ There appear to be no readily accessible checklists of mammals, fish, or invertebrates.

Globally, biodiversity information management is moving from a state of chaos to a more coordinated system of bioinformatics. This has enabled local data sets to be collated to form a regional and international picture. An important repository of such information is the Global Biodiversity Information Facility, developed by the OECD Megascience Forum's Working Group on Biological

Informatics. GBIF (<http://www.gbif.org>) is developing a compatible network of biodiversity databases and information technology tools for economic, environmental, and social uses. The following information was extracted on Liberian species.

Table 1: Summary of data available on Global Biodiversity Information Facility

Kingdom	Number of taxa
Animals	940
Fungi	28
Plants	87
Protozoa	17
Unclassified (most of which are plants)	767
Total (including family, genus, species, subspecies)	18,39
Total number of records	39,262

Species identification

Taxonomists need access to type specimens (that define the names of plants) if plants are to be correctly identified and knowledge about species is to be collated and communicated. There are extensive Liberian species reference collections in museums and herbaria across the world, particularly in the U.S., but no adequate working collections in Liberia. Access to these international collections from within Liberia is constrained by the absence of recognized facilities for the receipt of loans. This presents serious problems for taxonomic study based in Liberia. Local taxonomists would be forced to travel abroad in order to work with herbarium material.

There is no national flora of Liberia, and no comprehensive local field guides to plants. There is a comprehensive field guide to Liberian high forest trees,⁵⁹ and a guide to forest trees, shrubs, and lianas from the Upper Guinean forests has recently been published.⁶⁰

The African Plants Initiative (API), funded by the Mellon Foundation, aims to overcome some of these problems. API is a collaboration among nearly 40 institutions in Africa, Europe, and the United States with the aim of creating a digital library of scholarly resources about African plants. A database of high-resolution digital images of

Table 2: Top ten institutions providing data on Liberian biodiversity to GBIF

Data provider institution	Country where based
FishBase LB server (www.fishbase.org.ph)	Philippines
National Herbarium Nederland - Wageningen Branch (145.18.162.91)	Netherlands
National Herbarium Nederland - Leiden Branch (145.18.162.91) (www.nationaalherbarium.nl)	Netherlands
The Academy of Natural Sciences (www.janthina.acnatsci.org)	USA
MCZ-Harvard University Provider (digir.mcz.harvard.edu)	USA
Missouri Botanical Garden (MO) (digir.mobot.org)	USA
GBIF-MNHN (Paris) (dsibib.mnhn.fr)	France
Natural History Museum Science Database Collection (www.nhm.ac.uk)	UK
Louisiana State University Museum of Natural Science (LSUMZ) (130.39.185.43)	USA
Field Museum (FMNH) (digir.fieldmuseum.org)	USA

plant type specimens is being created and should be available online in late 2006.

Other regional initiatives include WAFRINET, the West African Network for Taxonomy, a Technical Network Cooperation⁶¹ that includes institutions from many neighboring countries such as Côte d'Ivoire, Sierra Leone, Ghana, Mali and Burkina Faso. Very few of the countries in this network have well-preserved and documented reference collections of fauna and flora. The network promotes species inventory and monitoring and biodiversity conservation activities, as well as the sharing of sub-regional expertise, information, records, technologies, collections, and infrastructure to achieve the network's objectives.

Threatened species

Information on globally threatened species can be obtained from the sources given in Table 3. While these databases are continually updated, they depend on accurate information from each country. In regions where regular and reliable monitoring of species populations has not been carried out, it is likely that this information is highly inaccurate. Rare species may be present but undiscovered; species known to be present may be suffering serious but unrecognized decline.

It is estimated that the Upper Guinean rainforest contains 2,800 vascular plant species, of which nearly one quarter are endemic and one in fifteen rare.⁶² Estimates of total species diversity, endemism, and threats for other major groups of organisms are either lacking or likely to be very approximate. Information on all IUCN red list species known to be found in Liberia has been compiled by Conservation International in the Key Biodiversity Area database. At present, there is very limited information on the national distribution of these species, making it difficult to design an efficient protected areas system.

At the national level, the Wildlife, National Parks, and Recreation Division of the Forestry Development Authority is engaged both in wildlife surveys and in identifying threatened animal species. Wildlife surveys, which have been supported by Conservation International and Fauna and Flora International, have focused primarily on existing protected areas and on proposed extensions to these areas.

It is not clear what criteria are used to identify nationally threatened species. For the sake of international comparability, it would be most logical to use the IUCN Categories and Criteria (Version 3.1).⁶³ This system is widely used and easily understood, and has been extensively tested.

Biodiversity management

Although in many surrounding countries, there is a cadre of experienced forest managers – many with formal qualification – the skills base in Liberia has been decimated by the civil war. Much of the knowledge and experience that had been accumulated was lost and is only recently being reestablished.

Table 3: Sources of information on the global threat status of major organism groups

Group	Data source
Mammals	IUCN Red List of Threatened Species
Birds	BirdLife International Globally Threatened Birds Factsheets
Plants	1997 IUCN Red List of Threatened Plants (Walter and Gillett 1998)
Reptiles	IUCN Red List of Threatened Species
Amphibians	Global Amphibian Assessment
Fishes	IUCN Red List of Threatened Species

Table 4: Species diversity, endemism, and threat. Source: World Conservation Monitoring Centre, IUCN, FAO (NBSAP Liberia, p. 75)

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
Reptile	67	2	2
Molluscs	n/a	n/a	1
Other Invertebrates.	n/a	n/a	1
Total	n/a	110	79

At present, most natural forest exploitation does not conform to international standards of sustainable forest management.⁶⁴ There is a lack of silvicultural knowledge and research. Liberia has no forest research institute. The EU-funded ECOSYN project has sought to facilitate the exchange of experiences and information on plant diversity and management of the forests of Upper Guinea between neighboring countries and is soon to publish a synthesis of this information. The EU/Conservation International-supported Liberia Forest Reassessment Project has compiled forestry data with the aim of improving forest management decision-making.

Research needs

The lack of species distribution data, local species checklists, and land use information poses a major challenge for land use planning. The National Biodiversity Strategy and Action Plan (NBSAP) for Liberia confirms that the absence of basic data is a major hurdle for biodiversity conservation. Therefore, the current research needs are as follows:

1. Measure and map biodiversity.

A detailed field survey combined with satellite imagery is required to create a complete and up-to-date habitat map for Liberia. The mapping process could use a supervised classification of a mosaic of recent remotely-sensed images, combined with a network of stratified-random field inventories to validate the map and collect detailed taxonomic information on each habitat type. The network would ideally incorporate any existing field inventory data and be designed to build on the Liberia Forest Reassessment Project.

A biodiversity inventory should focus on key indicator groups, including but not restricted to plants, birds, and mammals. The emphasis should be on extensive coverage rather than in-depth description. To this end, methods such as Rapid Botanical Surveys⁶⁵ and condition scores⁶⁶ should be used rather than permanent sample plots or the collection of detailed inventory data. At least 18 Liberian nationals have received training in biodiversity survey techniques in order to improve capacity for biodiversity surveys and monitoring in Important Bird Areas in the Upper Guinea Forest of West Africa, as part of a UK Government Department of the Environment Darwin Initiative Project.

2. Identify key drivers in land-use change.

Land-use change modeling helps planners to understand land-use change dynamics, drawing from historical analysis, social science field studies, remote sensing science, and ecology. This research seeks to understand the key drivers of deforestation and other forms of land-use change in Liberia. Land-use change models can use information from remotely sensed imagery with the addition of other GIS and readily available aggregate data. They can also incorporate data from socioeconomic surveys, in order to investigate how an individual chooses land-use practices and how these vary

over space and time. This type of research would reveal those areas most likely to be subject to pressure in the future and would permit different land management scenarios to be compared.

3. Evaluate social values in relation to biodiversity.

Social values are sets of ideals and beliefs to which people individually and collectively aspire and which they desire to uphold. Values play an important role in legitimating social, political, and economic institutions and practices, including law.⁶⁷ Ideally, law should reflect the social values that societies wish to uphold and/or adopt.

New social values tend to emerge from changes in knowledge and circumstances. Their adoption by society is often the outcome of social movements – informal collections of individuals and agencies that articulate particular value sets whose adoption, they believe, will create a ‘better’ world. Social values are adopted, rejected, and modified via bureaucratic and public debate.⁶⁸ Such processes help legitimate laws and policy and embed them as normative concepts in society. This principle was established by Gifford Pinchot in America at the turn of the 20th century. Through his use of the media and public debate, he embedded the concept of rational resource management as the dominant ‘frame-of-reference’ within the administrations of the U.S. and state governments.

Developing nations frequently indicate their desire and willingness to participate in the normative structures of the global world order by signing international conventions. Ratification of conventions invariably requires states to enact national legislation and a common way to achieve this is to ‘buy-in’ standardized laws from respected international legal centers. This makes sense from an administrative and political perspective, but it may not result in legislation that influences the way institutions and society think and operate. This is because the values that underpin the legislation may be unfamiliar, unknown, and/or contradictory or unacceptable to key adopters of the legislation.

To enhance the performance and impact of environmental legislation in countries such as Liberia, studies could be conducted on residents’ knowledge and attitudes towards nature and the

environment. Such understandings create the capacity to a) frame environmental legislation in world views that are meaningful to key adopter groups; b) promote a broad-based public debate grounded in new data and insights on the human-nature relationship; and c) devise sophisticated messaging to support the introduction and adoption of new laws.

The authors propose a model to integrate environmental regulations with cultures. This model is currently being tested and developed through a major study in Indonesia to test the efficacy of market-led vs. regulatory approaches to deal with the biodiversity conservation impacts of the hugely popular pastime of bird-keeping. There are three dimensions to this model:

1. A conceptual framework that draws on scholarship in the areas of a) nature and society; b) social construction of reality; c) legitimacy and governance; d) social change and communicative action; and e) social marketing.
2. An organizational partnership that blends thinking, networks, capacities, and expertise across sectors.
3. A capacity-building program that seeks to build local expertise (and confidence) in designing and executing social surveys and communicating their findings in an effective manner.

In short, this model seeks to contribute to an evidence-based policy dialogue and build the legitimacy of academic and civil society actors to participate in this aspect of governance.

On a practical level, the proposed approach has the following elements:

- 1) Framing the legislative/policy issues in terms of choices between options.
- 2) Exploratory qualitative research to ascertain different world views, cultural symbols and beliefs, issues, etc. relevant to the focus of the law or policy, and to identify the key adopter groups, including potential change agents.
- 3) A series of three training courses titled 'Social survey skills for environmentalists' which cover a) the potential of social surveys to improve the

policy of survey design and planning; b) data analysis; and c) communicating survey findings.

- 4) A major dedicated survey on the issue concerned that is conducted by the local environmental movement, whether this is located in the universities, NGOs, or the responsible government department.
- 5) Developing a strategy for communicating and discussing the policy issue and survey findings. Guided by the conceptual framework, this is likely to include:
 - public talks and panel discussion in town and cities
 - media articles and panel discussion (e.g. radio)
 - seminars and briefings to policy makers and policy advocates.

(2) Species Protection

Introduction. Wildlife species, including those forming part of the bushmeat trade, are a critical part of Liberia's biodiversity, but they face significant threats from human activities including timber exploitation, hunting, shifting cultivation, mining, and rubber plantations.⁶⁹ Concerns about threats to these species have spurred extensive advocacy by national and international organizations. Efforts to protect wildlife species should focus on the reasonable restriction of human activities and the conservation of critical habitat both within and outside of protected areas. An effective legal framework should also address the subsistence needs of local communities, which drives much of the illegal hunting of wildlife.

International Law. Several multilateral environmental agreements addressing species protection and conservation apply to Liberia as a signing party.⁷⁰ The Convention on Biological Diversity⁷¹ directs signing parties to promote the maintenance of viable populations of species in natural surroundings, to develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations, and to adopt measures for the recovery, rehabilitation, and reintroduction of threatened species into their natural habitats. Article 4 of the Ramsar Convention⁷² requires signatories

to increase waterfowl populations by establishing and managing nature reserves on wetlands. The African Convention⁷³ requires signatories to ensure the conservation of species and their habitat through a broad range of actions, including the management of plant and animal populations inside and outside conservation areas, managing and protecting aquatic environments, conducting inventories and mapping fauna and flora, and adopting legislation to protect threatened species and regulate all forms of wildlife takings, including hunting, capture, and fishing.

Summary of Liberian Law

2006 Forestry Law. The primary legal provisions governing species protection in Liberia are Sections 9.11 (“Wildlife Conservation”) and 9.12 (“Protected Animals, Hunting, and Trade in Wildlife”). Section 9.11 gives FDA authority to conserve, manage, and control hunting, the use of wildlife, and trade in wildlife. Section 9.12 directs FDA to conduct wildlife surveys and to establish and maintain a list of threatened and endangered animals (9.12(a)(ii)); prohibits the hunting of protected animals (9.12(b)); imposes restrictions on the possession of protected animals (9.12(d)); and establishes a permit requirement for keeping wild animals (9.12(g)). The 2006 Forestry Law also prohibits hunting in Strict Nature Reserves, National Parks, Nature Reserves, and Cultural Sites (9.10, “Protected Forest Area Regulations and Prohibitions”), and specifies fines of up to USD 25,000 and/or up to 12 months’ imprisonment for violations of the above provisions. (Sec. 20.7).

These provisions will likely be followed by additional legislation. Section 9.11(c) of the 2006 Forestry Law requires FDA to present to the Legislature, within one year of the Forestry Law’s effective date (October 4, 2006), a comprehensive framework law for wildlife conservation and protection.

FDA Regulation 25. Regulation 25, Revised Administrative Fees on Wildlife Conservation, imposes additional requirements on the hunting of non-protected wildlife, including a permit requirement with annual fees; administrative fees for mammals, reptiles, and birds killed during game hunting; a Wildlife Conservation Fee levied on all export permits issued under the Convention on International Trade in

Endangered Species (“CITES”); and administrative fees for the ownership of live wildlife animals as pets (Section IV). It prohibits hunting in National Parks, Nature Reserves, National Forests, “environmentally threatened areas, and other areas so designated” (Section III), and defines offenses and corresponding penalties for illicit hunting or violation of any provision governing protected areas (Section VI).⁷⁴ The regulation also establishes permit requirements for hunting and wildlife trade operations (Section II), requires sellers of bushmeat to possess a current business certificate and to obtain a permit from the FDA (Section V), and provides two separate lists of protected animal species in Liberia (Sections I & VI).

2003 Environment Protection and Management Law. The 2003 Environment Protection and Management Law also addresses species protection. Section 80 (Protection of Wild Animals and Birds) charges EPA and relevant ministries with developing guidelines and recommendations to preserve and protect “all wild animals and birds and in particular, rare, threatened and endangered species and their habitats.” This section also requires EPA to develop wildlife conservation areas and to prescribe conservation measures to ensure the coexistence of communities and wildlife, both in these areas and as may be necessary for wildlife management generally. Section 84 (Conservation of Biological Resources In-situ) directs EPA to prescribe special measures for the protection of species, ecosystems, and habitats threatened with extinction. And under Section 82 (Protection of the Coastal Zone and Marine Environment), EPA must prepare an inventory of marine fisheries, turtles, and whales, including harvesting and licensing activities, as part of a periodic coastal zone survey.

Timber. Other FDA regulations address the conservation of selected timber species. Regulation No. 17 sets a minimum diameter of 60 centimeters for Niangon logs to be exported, which as of June 1989 dominated the domestic and export timber markets. Regulation No. 18 bans the export of ten timber species of declining supply. Both regulations impose penalties providing for confiscation of logs or payment of their full value (if they have already been exported) (Section III).

Analysis

Inconsistencies. As discussed in part under Section 1 of this report (Protected Areas), there are several inconsistencies between the 2006 Forestry Law and the older Regulation 25, which may largely be due to the fact that the regulation was promulgated under the now-repealed 1988 Wildlife and National Parks Law (and may as a consequence be invalid itself. In addition, new regulations are likely to supplant Regulation 25 in its entirety). As noted, the Regulation does not appear to recognize the new protected area categories that were created under the 2003 Protected Forest Areas Network Law (carried over into the 2006 Forestry Law) and made subject to various hunting prohibitions, including Strict Nature Reserves under Category I, and Game Reserves, Controlled Hunting Areas, Communal Forests, and Buffer Zones under Category II. In addition, Section 20 of the Forestry Law and Section VI of Regulation 25 impose conflicting penalties for violations of the provisions relating to protected species. These inconsistencies highlight the need for an updated regulation that would clarify the enforcement provisions and their application to species violations in each protected area. The U.S. Forest Service has crafted a proposed regulation (Appendix XV to its 2005 Report) that provides a good example of how to incorporate many desired elements of species protection.⁷⁵

Listing of Species. The species-listing provision in Section 9.12(a) of the 2006 Forestry Law raises several concerns. First, FDA does not appear to have compiled a current list of threatened and endangered species under this law. Although Regulation 25 contains two separate lists of protected animals,⁷⁶ one for “fully protected animals” and the other for “endangered animal species,” this terminology is inconsistent with Section 9.12, and as noted, the regulation was promulgated prior to passage of the 2006 Law. Second, the legislation does not define the terms “threatened”, “in danger of extinction”, or “protected” with respect to species – though, for example, protected species should logically include those that are threatened or endangered. Elaboration of these definitions is crucial for developing lists of species to achieve the law’s purpose of protecting species that are at risk of endangerment or extinction. Third, the law provides no criteria or procedures for the listing and updating of threatened and endangered species.

Although the wildlife surveys described in Section 9.12(a) are presumed to form the basis of a decision by FDA to list a species as threatened or endangered, the law may not provide enough guidance to ensure that they fulfill this purpose. For instance, the law does not specify how often these surveys should be conducted, how comprehensive they should be, how survey data will be kept and made available to other agencies as needed,⁷⁷ and how this data will be used in making listing decisions. A more detailed law or regulations could address this gap with respect to the requirements of these surveys (other than the fact that they should address wildlife population, distribution, and status, as provided in Section 9.12(a)(i)).⁷⁸

Prohibitions. Other than the prohibitions on hunting, capture, and trade, neither the 2006 Forestry Law nor Regulation 25 regulates the “taking” of protected species as a result of actions that may harm or kill such species, including construction, land development, resource extraction, fishing, and many other activities. Although Chapter 9 of the 2006 Law does regulate activities such as prospecting, mining, farming, and fishing in certain protected areas, these protections do not extend to species located outside of such areas. Biodiversity protection would be strengthened by a legal permitting requirement for activities that may affect listed species and their habitat, particularly those species located outside of protected areas. The 2000 Forestry Law (and its counterpart provisions within the 2006 Law) also removed important prohibitions on hunting methods contained in Section 37 of the 1988 Wildlife and National Parks Law.⁷⁹ Restoration of these prohibitions is recommended.

Enforcement. Chapter IX of the 1988 Wildlife and National Parks Law gave the FDA broad inspection and arrest powers to enforce the Act’s wildlife and protected area provisions, including the authority to enter and search a variety of buildings and premises and to seize a range of weapons, vehicles, and animals used in the commission of an offense under the Act.⁸⁰ However, the detailed listing of these powers was not carried over into the 2000 (or 2006) Forestry Law. Instead, Section 20.5 of the 2006 Law (Search, Seizure, and Visits) merely states that law enforcement and FDA officers “may conduct visits, searches, and seizures pursuant to the laws of Liberia.” This provision may

weaken the specific authority of FDA to protect endangered and threatened species from hunting and other threats. In addition, although FDA Forest Officers retain authority under Section 13 of the 1976 FDA Act to arrest those who violate, or are reasonably suspected of violating, the agency's laws or regulations, the language of the Act limits this authority to the conservation of forests, which by its terms does not expressly appear to include wildlife protection.

Another enforcement question concerns FDA's ability to confiscate live wild animals. Although Section 9.12(g) authorizes FDA to take possession of wild animals from persons lacking a permit, it does not provide for facilities in which to keep these animals, or set forth procedures governing their release or reintroduction into the wild wherever possible. Without such measures, the FDA's ability to control the illegal possession of wildlife will remain limited.

Yet another enforcement issue concerns the removal, in the 2000 Forestry Law (carried over into the 2006 Law), of the Controlled Hunting Areas designated under the 1988 Act. These areas, which allowed hunting in accordance with FDA regulations, may have alleviated pressure on wildlife species in other protected areas subject to more stringent prohibitions.⁸¹ Although the 2006 Forestry Law does allow hunting in some protected areas (such as Communal Forests, National Forests,⁸² and Multiple Sustainable Use Reserves), it is unclear whether these areas would serve the same function as a Controlled Hunting Area.

Other Provisions. The 2006 Forestry Law does not address important components of species protection and recovery, such as the conservation of critical habitat and the development of recovery plans for listed species. Although the law defines "wild animal" to include any animal (vertebrate or invertebrate) and insects of every description (Sec. 1.3), it might be useful to clarify that this also includes all aquatic species.⁸³ The definition of wild animal, which is not limited to a particular ecosystem, is also inconsistent with the term "wildlife," which is defined to include plants, animals, and micro-organisms "within a forest ecosystem" (Sec. 1.3). It is not clear what purpose this distinction serves.

Legal Framework. As previously noted with respect to protected areas legislation (Section 1, above),

the species protection provisions could be moved out of the 2006 Forestry Law and consolidated with those found in the 2003 Environment Protection and Management Law.⁸⁴ This would help facilitate the development of more extensive wildlife legislation and avert jurisdictional conflicts, such as between FDA's Division of Wildlife and National Parks and the Ministry of Agriculture's Bureau of Fisheries, both of which have, at times, claimed jurisdiction over sea turtles, sharks, and dolphins.⁸⁵ The 2006 Forestry Law's requirement that FDA pass a comprehensive framework law for wildlife conservation and protection presents a valuable opportunity to develop a more significant, stand-alone piece of wildlife legislation.

Similar reasoning supports the creation of a separate agency with jurisdiction over wildlife issues. As noted above, the U.S. Forest Service endorsed such a plan in its 2005 Report, which proposes the establishment of either a strengthened wildlife section within FDA, or a separate agency that could be known as the Liberia Forest Authority (Report at 1-2).

The U.S. Forest Service Report also proposes drafting a single piece of legislation that would combine protected areas and species protection, following the example of other African countries and U.S. states (Report at 2-3). There are advantages and disadvantages to such an approach. A combined law might provide a more comprehensive regime of species protection by placing it within the overall framework of ecosystem protection, rather than focusing on a somewhat artificial distinction between species and their habitat. Following the example of neighboring countries that also combine these issues in their legislation might facilitate regional cooperation, where possible, on biodiversity conservation. Moreover, protected areas and species conservation in Liberia are already addressed, to a large extent, within a single law, the 2006 Forestry Law – though as noted, that law may not prove to be the optimal vehicle for implementing biodiversity protections, and in any event, it already calls for development of a separate wildlife conservation and protection law.

On the other hand, linking wildlife protection and protected areas too closely can have a detrimental impact on species conservation, where the need for conservation extends beyond protected areas

to unprotected or private lands. The U.S. Forest Service Report highlights the problems with such an approach, citing the example of Sierra Leone, which only bans hunting in protected areas. This tactic leaves hunting outside of protected areas unregulated (Report, Appendix X at 2). A second problem with a consolidated policy approach to species protection and protected areas is that protected area staff may become the only authorities who understand and can enforce the hunting restrictions (*id.*). In short, it is not recommended that protected area legislation form the sole basis of a wildlife conservation strategy, particularly where the activities of extractive industries such as logging and mining pose threats to species outside of protected area boundaries (*id.* at 3). This is especially true given that Liberia has, to date, established only one national park and one nature reserve. To the extent that many threatened or endangered species are located outside the boundaries of existing protected areas, legislation to protect these species and their critical habitat is likely to be far more effective if its safeguards reach beyond the borders of discrete protected areas.

(3) Trade in Species

Introduction. The international wildlife trade, which is estimated to run in the billions of dollars and involve hundreds of millions of plants and animals,⁸⁶ adds pressure to already-depleted plant and animal populations. This trade includes, in addition to live animals and plants, products derived from wildlife, such as food, leather, and medicines. The domestic wildlife trade also poses serious threats to a large number of species. In Liberia, a thriving bushmeat market targets both common and protected species, including the Forest Hog, Ogilby's Duiker, Royal Antelope, and Water Chevrotain.⁸⁷ Strict regulation of domestic and international trade in species is therefore an essential component of any comprehensive scheme for wildlife protection.

International Law. Liberia is party to several international environmental agreements covering species protection and trade. Chief among these is the Convention on International Trade in Endangered Species⁸⁸ (CITES), which requires signatories to protect certain species of wild flora and fauna, including timber species, against

over-exploitation through trade. CITES establishes three levels of protection for species, listed in its Appendices I-III, through various import and export requirements. Appendix I lists all species threatened with extinction, or that may be threatened with extinction, as a result of international trade, and generally prohibits international commercial trade in these species. Appendix II lists species that may be traded internationally subject to strict regulatory measures, while Appendix III provides a means for individual states to list species that are threatened within their borders and whose survival depends on international cooperation. Under Article VII of the Convention, signing parties may make certain exceptions to the general principles described above for animals bred in captivity, artificially propagated plants, specimens designated for scientific research, animals and plants forming part of a traveling collection or exhibition, and personal and household effects.

In addition to CITES, Article XI of the African Convention⁸⁹ requires parties to regulate domestic trade in specimens and products, including their transport and possession, to ensure that they have been obtained in conformity with domestic law and international obligations. Finally, Article 27 of the International Tropical Timber Agreement⁹⁰ requires signatories to periodically review the future needs of international trade in industrial tropical timber and to identify and consider appropriate responses in the areas of reforestation, rehabilitation, and forest management.

Summary of Liberian Law

Wildlife. Section 13.1 (International Trade in Wild Animals, Protected Animals, and Wildlife) of the 2006 Forestry Law constitutes the main domestic authority on the international wildlife trade. This section imposes restrictions on imports and exports, including a permit requirement for the export of wild animals (13.1(a)); prohibitions on the export of protected animals or CITES-listed species except for scientific research, including captive breeding (13.1(b)(i)); conditions on the granting of export permits for protected animals (13.1(b)(ii));⁹¹ and a permit requirement for the import of any wildlife species (13.1(c)). All permits to export wildlife must be obtained from the FDA, while permission to import wildlife requires an import permit from the FDA as well as an export permit issued by the

country of origin. Sections 20.7 and 20.1 of the Forestry Law specify fines and imprisonment for violations of these provisions.

In addition, FDA Regulation 25 requires permits for wildlife trade operations, including annual fees and the submission of specified information (Section II).

Timber. Section 13.5 of the 2006 Forestry Law requires timber exporters to enroll in the Chain of Custody in order to obtain an export permit. Several older FDA regulations address the conservation of selected timber species, including a minimum diameter for the export of Niangon logs (No. 17) and a ban on the export of 10 specific log species (No. 18). In addition, Regulation 19 imposes a ban on charcoal exports until local demand has been sufficiently met.

Analysis

The CITES National Legislation Project, which examines countries' compliance with CITES provisions, has placed Liberia in Category 3, indicating that Liberia's legislation is not adequate under CITES standards.⁹² CITES has actually issued a notification to the Parties to suspend all trade in CITES-listed species from Liberia because of the country's lack of progress on national legislation.⁹³ Accordingly, Liberia might wish to strengthen its species trade legislation in a number of areas, including with respect to exports, imports, and other permitting authorities.

Definition. Existing legislation addresses only wildlife and, to a small degree, timber products. To fully comply with CITES, the Liberian law would also need to include plants and aquatic species (although these are not excluded from the 2006 Forestry Law's definition of "wild animal," they should be explicitly mentioned), together with all species parts and derivatives.

Imports. CITES mandates that Appendix I species only be imported pursuant to the issuance of both a valid export permit and an import permit by a country's own Management Authority (which in Liberia is the FDA), upon a showing that the species will not be used for primarily commercial purposes and that the import will not be detrimental to the survival of the species.⁹⁴ Although the 2000 Forestry Law⁹⁵ only required importers to obtain a valid export permit (in violation of this requirement), the 2006 Law⁹⁶ has since corrected this omission.

However, the 2006 Law does not require, as CITES mandates, that a certificate be issued by the appropriate Management Authority for Appendix I- and II-listed species that are harvested from the open sea (e.g., beyond the coastal range, which is still within a country's jurisdiction).⁹⁷ To fully comply with CITES, Liberia would need to legislate this requirement.

Exports. In some ways, Liberia's existing export provisions may be stricter than the CITES requirements. For instance, although CITES allows the trading of Appendix II-listed species for commercial purposes (Art. IV), Liberia bans the export of all Appendix I and II species, except for purposes of scientific research (13.1(b)(i)). Because CITES requires certain findings to be made prior to issuing an export permit for Appendix II-listed species,⁹⁸ Liberia's strict export ban may simply reflect a recognition that the FDA does not have the capacity to make these findings at the present time. At the same time, the 2006 Forestry Law lacks a permit requirement for trade in Appendix III species,⁹⁹ though this is required under CITES. Specifically, under Article V, trade in an Appendix III species requires an export permit from a country that has included that species in Appendix III and a certificate of origin from all other Parties. Liberia should consider incorporating the applicable permit requirements into its domestic laws.

Other Permit Provisions. Pursuant to CITES, domestic law must also give the Management Authority power to cancel a permit where it was issued as a result of misleading or false information, or where the applicant has failed to comply with any permit conditions or relevant provisions of the 2006 Forestry Law or CITES. Liberian law lacks such a provision. Nor does it state whether fees are required for such permits, which, while not required under CITES, can be an important way to finance a regulatory program.¹⁰⁰ Other desirable (though not required) provisions include the authority to place conditions on the granting of permits and procedures for appealing permit decisions.

Domestic Trade. Although Regulation 25 mandates that wildlife trade operations be permitted, this requirement extends only to the buying, selling, or exchange of wildlife species (Section I) and appears to be directed to corporate entities rather than individuals,

as evidenced by the requirement that permit applicants submit articles of incorporation and a business registration certificate (Section II). A comprehensive regulatory scheme would cover the possession and transport of wildlife and plant products by individuals as well as business entities. At the same time, it might be desirable to maintain stiffer penalties for business entities, on the theory that they are likely to engage in wildlife trade on a much wider scale.

Exotic Pet Trade. The practice of buying and keeping wildlife as pets by both national and foreign residents has become a burgeoning problem in post-conflict Liberia. The pets, many of which are endangered, can introduce diseases into the native wildlife population and trigger genetic changes through interbreeding.¹⁰¹ Among the species illegally brought into Liberia are “japanzees” (chimpanzees) from Sierra Leone, alligators and elephants from the Ivory Coast, leopards, pygmy hippos, forest buffalo, crocodiles, and sea turtles.¹⁰² Further complications ensue when foreign resident pet owners remove their pets illegally from the country when they travel or return home.

Current law does impose restrictions on this practice. For example, Section 9.12(d) of the 2006 Forestry Law prohibits the possession of protected animals without a certificate of legal ownership, while Section 9.12(g) prohibits the keeping of wild animals in captivity without a valid Wild Animal permit (and gives the FDA authority to seize animals from persons lacking such a permit). Similarly, Section 13.1(c) requires, for wildlife imports, a valid export permit from the country of origin and a certificate from the Ministry of Agriculture or Ministry of Health & Social Welfare attesting that the animal is in good health and free of all communicable diseases. However, until the FDA passes regulations to implement these requirements, they will be largely ineffective, particularly since the law does not provide for facilities in which to keep animals that have been seized (see discussion under *Enforcement*, above). Moreover, although the law defines wild animal (as used in Section 9.12(g)) to include all animals that are not domesticated (Section 1.3), this definition is undermined by the failure to define domesticated animals. In addition to these legal gaps, significant enforcement gaps, such as the imposition of insufficient penalties, remain.¹⁰³

Trade in Species: Environmental Information

Key data requirements

International Trade

Signatories to the CITES Convention are required to submit annual reports on the number and type of export and import permits and certificates granted; the States with which trade in CITES-listed species has occurred; and the quantities and names of traded species. They are also required to submit biennial reports on legislative, regulatory, and administrative measures taken to enforce the Convention, such as new laws or regulations, publicity campaigns, training, monitoring, inspections, investigations, seizures, confiscations, prosecutions, or convictions. Both annual and biennial reports serve a valuable management function, allowing countries to monitor progress and assess their wildlife management and trade policies.

Liberia is a signatory to the International Tropical Timber Agreement, 2006. One of the principal objectives of this international agreement is to ensure that tropical timber originates from sustainably managed sources.

National Trade

For many West African nations, local trade in bushmeat has the most serious impact on wildlife conservation. Over-hunting is considered to be a more important cause of biodiversity loss in this region than deforestation.¹⁰⁴ Bushmeat is also a crucial source of income and an important food resource for rural populations. The sustainable management of game species should therefore be a priority in national natural resource management plans.¹⁰⁵

Existing data

International Trade

Details of all CITES-listed species native to Liberia can be obtained from the CITES species database at <http://www.cites.org/eng/resources/species.html>.

Table 5: Total numbers of Liberian plant and animal species listed in Appendices I-III.

Appendix I	24
Appendix II	138
Appendix III	114

A number of countries have, in the past, implemented trade bans on CITES species from Liberia because of its failure to complete reporting requirements. The implication is that there may have been problems collating the information necessary to make annual reports.

Compared with many countries in the region, Liberia has recorded limited trade in CITES-listed species in recent years. This may be because a large proportion of such trade ignores the requirement for permits. Alternatively, it may reflect a depressed level of international trade following the civil war.

Timber was an important source of income in Liberia until the ban of all imports of round logs and timber products by UN member states in July 2003. Very little of the revenue generated by logging activities came to the national Treasury.¹⁰⁶ United Nations Security Council Resolution 1521 (2003) prevented international trade in timber from originating in Liberia in order to deprive combatants of revenue from timber.

Domestic trade

Preliminary attempts to quantify trade in bushmeat in Liberia suggest that it is of very great importance to rural populations both economically and nutritionally.¹⁰⁷ Although bushmeat is known locally to be an important source of protein, large-scale patterns of demand are poorly defined. There is little or no information available on sustainable levels of exploitation. These factors should form a fundamental component of a sustainable wildlife management strategy.

Little or no quantitative forestry data survived the civil war. This is a major loss, since long-term data is particularly valuable in the development of forest management plans for the sustainable production of timber. The EU/Conservation International-supported Liberia Forest Reassessment Project has compiled forestry data with the aim of improving forest management decision-making.

Research needs

International Trade

1. It is important to continue to monitor the number and type of CITES export and import permits granted in Liberia, and the types of

species and products that are traded, in order to assess the impact of new laws or regulations or other policy changes.

2. In view of the likelihood of significant smuggling activity, Liberia might increase both resources and the skills base available for trade monitoring. A great deal can be achieved, and considerable experience gained, by working in close collaboration with neighboring countries.
3. It would be helpful to develop forest management plans that are acceptable to all local land users and international timber and nature conservation organizations.

Domestic Trade

1. The significance of wildlife use to rural livelihoods should be quantified. Information on the number and species of animals killed, prices of bushmeat, and public perceptions of trends in species populations can be obtained through the use of questionnaire interviews.
2. Estimates of the impact of hunting on game species populations can be made by comparing sites subject to different hunting pressures. Such surveys typically follow a standard line-transect survey methodology.¹⁰⁸ This type of survey needs to be rigorously designed and carried out at regular intervals, and the results should be correctly analyzed in order to yield meaningful results. The work is laborious and might therefore be of most value if efforts and resources were focused on a small number of important sites.

Existing capacity and capacity-building

The National Quarantine and Environmental Service Department of Technical Services, within the Ministry of Agriculture, is responsible for implementing controls over the export and import of CITES-listed species. This is a demanding and laborious job that requires access to expert scientific advice if it is to be carried out effectively. Widespread reports of a significant illegal trade in animals from Liberia suggest that at present this Department does not have the capacity to effectively control trade in endangered species. In addition, the Department appears to lack facilities in which to keep live animals that have

been confiscated, as well as procedures and guidelines for their release or reintroduction into the wild. The need for both infrastructure and expertise is significant.

A UK Department of the Environment-funded project in Gabon, working in collaboration with the Ministère de l'Economie Forestière, is building capacity for monitoring and managing the bushmeat trade. The project involves:

1. Developing a training module for local staff to enable them to collect nationwide data on the volume, economics, and geographic distribution of the bushmeat trade;
2. Providing policy-oriented training relevant to managing the bushmeat trade; and
3. Communicating research results to policy makers and the public. Posters, leaflets, and videos were produced that reported research results and their policy implications.

This project may serve as a useful model for developing similar capacity within Liberia.¹⁰⁹

At present, Liberia is working to develop the necessary institutional capacity to control unplanned deforestation and illegal timber harvesting and corruption in the forest industry, and to design and instigate systems for sustainable forest management. The Forestry Development Authority has developed a forest policy review that incorporates the ITTO Objective 2000.¹¹⁰ Successful implementation of this forest policy requires a cadre of well-trained forestry professionals and technicians. The current lack of appropriately qualified personnel in the FDA is a major constraint on its effectiveness. As a signatory to the International Tropical Timber Agreement, 2006, Liberia is eligible for resources to enhance its capacity to implement a strategy for achieving exports of tropical timber and timber products from sustainably managed sources.

(4) Invasive Species

Introduction. Invasive species (also known as exotic, alien, or nonindigenous species) are non-native plants, animals, and other life forms whose introduction can cause economic or environmental harm.¹¹¹ They can compete with native species

for food; destroy ecosystems; cause losses to agriculture, forestry, and fisheries; and interfere with the maintenance of open waterways. Invasive species have been identified as the second-largest threat to native species worldwide, after habitat destruction,¹¹² and have become the target of increasingly stringent national legislation in numerous countries. Significant pathways for the introduction of invasive species include the global shipping industry, exports and imports of raw materials, tourism, and the exotic pet and nursery industries. Because invasive species can establish themselves so rapidly in new ecosystems and wreak such destructive environmental and economic impacts, prevention and early detection/rapid response measures can be critical to protecting native species and their habitats from new invaders.¹¹³

International Law. Liberia is party to several international agreements with provisions that address the problem of invasive species. Article 8 of the Convention on Biological Diversity¹¹⁴ requires signatories to control, eradicate, and prevent the introduction of alien species that threaten ecosystems, habitats, or species. The African Convention¹¹⁵ directs parties, under Article VIII, to take concrete steps or measures to control invasive species. Specifically, Article IX requires parties to strictly control the intentional and accidental introduction of non-native species, including genetically modified organisms, in any area, and to undertake efforts to eradicate already-introduced species whose impact is detrimental to native species or to the environment in general. Finally, Resolution VII.14 of the Ramsar Convention¹¹⁶ calls upon parties to inventory invasive species in wetlands within their jurisdictions, prioritize those invasive species that pose a threat to wetlands, and develop strategies and programs to eradicate or control invasive species of top priority.

Summary of Liberian Law

2003 Environment Protection and Management Law. Liberia's invasive species provisions, which mainly target the introduction of non-indigenous species, are found entirely within the 2003 Environment Protection and Management Law. These provisions direct EPA to issue guidelines and prescribe measures to prohibit or control the introduction of alien species *in-situ* (Section 84(e)); prohibit the introduction or

planting of any part of an alien species, plant or animal, in a river, lake, or wetland (Section 75(2)(c)-(d)); and require EPA to develop contingency plans for managing environmental disasters, including a major pest infestation or introduction of alien plants or animals (Section 50(d)).

In addition, Section 6 and Annex I of the Law require the preparation of an Environmental Impact Assessment for the following activities involving invasive species:

- Introduction of new breeds of crops (1, Agriculture)
- Introduction of new breeds of livestock (2, Livestock and Range Management)
- Pest Management (3, Forestry Activities)
- Introduction of new species in water bodies (4, Fisheries Activities)
- Introduction of new species (5, Wildlife)

Analysis

Legal Framework. The effectiveness of legislative provisions governing invasive plant and animal species is hampered by the absence of implementing regulations. A comprehensive legal framework to manage invasive species should include measures on prevention, early detection/rapid response, regulation, control and management, enforcement and implementation, education and outreach, and funding.¹¹⁷ Essential components of such a regulatory approach typically include a functional definition of invasive species; authority to prohibit the introduction or release of invasive species; permit requirements for the possession, transport, and trade of invasive species; authority to conduct inspections on private and public property and to seize and destroy invasive species; an inspection and classification system for screening proposed species imports, including a list of accepted and/or prohibited plant and animal species based on established criteria; and a permitting system for the use of control methods (mechanical, chemical, biological).¹¹⁸ Liberia's legislation appears to contain some authority for preventing the introduction of invasive species, but this is limited to protected areas (*in-situ*) and certain waterbodies (i.e. rivers, lakes, and wetlands).

Early Detection/Rapid Response. An effective early decision/rapid response system can be critical for bringing a new, potentially devastating invasion under control before it becomes too large to eradicate, particularly in a country such as Liberia, which may lack adequate resources to support management and control efforts once an invasive species has become established. Ideally, a comprehensive early detection/rapid response program would include ongoing monitoring for new invasions; a system for detecting, reporting, and identifying the establishment of new invasive species; a rapid response protocol that includes the designation of a lead agency, the authority to quarantine the affected area, and the implementation of management options for control and eradication; and monitoring and evaluation of the treatment method to assess its effectiveness and verify that the introduced species has been eradicated.¹¹⁹ The requirement that EPA develop contingency plans for managing environmental disasters, including a major pest infestation or introduction of alien plants or animals, could encompass early detection/rapid response efforts, but such a plan has not yet been developed.

Public Education and Outreach. Given the many pathways that exist for the introduction of invasive species, particularly in an ever-expanding global economy, even a sound regulatory approach can, at best, address only part of the problem. In many cases, the public is unaware of the ecological and economic threats posed by invasive species and the importance of taking steps to prevent their establishment and spread. Liberia is seeking to assume an ever-greater role in global markets, and it does import food and live animals,¹²⁰ both of which can serve as pathways for invasive species. A comprehensive regulatory approach must therefore be supplemented by extensive public education and outreach on the pathways, risks, and prevention measures associated with invasive species.

Invasive Species: Environmental Information

Key data requirements

1. Risk assessment: Invasive species are species non-native to Liberia that are likely to cause economic or ecological damage or harm human health.

2. Map current national distribution of established invasive species.
3. Identify effective prevention and control methods: The most effective means of management is to prevent deliberate or accidental import. It is difficult to control natural invasion across national borders.

Existing data

1. Risk Analysis: IUCN's Global Invasive Species Database (<http://www.issg.org/database/>) provides global information on invasive alien species. The database covers all taxonomic groups from micro-organisms to animals and plants. It is up-to-date and detailed, including information on species' biology, ecology, native and alien range, references, contacts, links, and images. Information is supplied by expert contributors from around the world and is therefore of high quality. Seven invasive species are listed for Liberia in Table 6. It is likely that this is a significant underestimate of the number present in the country.
2. Distribution mapping: There appears to be no systematic mapping of invasive species distributions in Liberia at present.
3. Control methods: Invasive species are a global problem. There is considerable regional and global expertise on effective control.

Research needs

1. Expert review of information on those species worldwide that are capable of establishing in Liberia.
2. Development of a reporting system for key invasive species considered to present significant risk. Early detection of invasive species is crucial to their effective management.

Pest and Pathogens

Key data requirements

1. Risk assessment: Identify those pest and pathogens that are likely to cause significant economic or ecological damage or harm human health. Identify potential vectors and transmission routes.

Table 6: Invasive species listed in the Global Invasive Species Database as present in Liberia

Species	Description
<i>Chromolaena odorata</i>	A fast-growing perennial shrub that is a nuisance agricultural weed.
<i>Eichhornia crassipes</i>	Water hyacinth; may choke slow-moving to still water bodies and prevent beneficial use for fishing or navigation.
<i>Hypnea musciformis</i>	Marine algae that forms thick, unpleasant-smelling mats.
<i>Lantana camara</i>	Herb and serious agricultural weed.
<i>Leucaena leucocephala</i>	Agroforestry tree that can invade semi-natural or natural habitats which are of conservation interest.
<i>Solenopsis geminata</i>	Fire ant that destroys native ant communities, harms agriculture, and is a painful pest to humans.
<i>Vibrio cholerae</i>	Bacteria that causes cholera.

2. Monitoring: Compile data on the extent of pest and pathogen outbreaks and assess the extent of the impacts in order to set priorities and inform policy.
3. Identify effective control measures: scientific advice is required on the most suitable methods for protection against outbreaks as well as their detection, suppression, and elimination.

Existing data

1. Risk assessment: Records of past pest and pathogen outbreaks in Liberia are rare and do not adequately identify the organisms involved. The International Portal on Food Safety, Animal and Plant Health (<http://www.ipfsaph.org/>) provides access to official international and national information and contains useful data from other countries in the region.
2. Monitoring. Information on the extent and methods of spread of past outbreaks is anecdotal. There appears to be no official system for reporting pest or pathogen outbreaks. The sparse information available concerns agricultural pests and pathogens (mainly of rice and rubber).
3. Control Measures: While knowledge of disease and pest control in Liberia is embryonic, Liberian authorities can make use of extensive

international expertise. Liberia is a party to the International Plant Protection Convention, an international treaty designed to prevent the spread and introduction of pests of plants and plant products. Parties to the Convention share information on appropriate measures for control and develop International Standards for Phytosanitary Measures. The World Organization for Animal Health (<http://www.oie.int/>) issues disease alerts, promotes dissemination of information on important animal health risks, and has developed rules for trade in animals and animal products that can serve as a useful template. The Institute for Animal Health (<http://www.iah.bbsrc.ac.uk>) provides advice to international governments on animal health issues.

Research Needs

1. Expert review of regional pest and pathogen problems in order to set priorities and inform policy. It would be judicious to identify likely routes of introduction for key pests and pathogens in order to ensure that adequate controls, surveillance, and quarantine systems are in place.
2. Development of a notification system for important pests and pathogens. This is a vital step towards the management of important outbreaks since it will enable the growth and spread of pests and pathogens to be monitored and the effectiveness of control measures to be assessed.

(5) Community-Based Natural Resource Management

Introduction. In Liberia, as in many other developing countries, widespread poverty has spun a complex web between community subsistence needs and natural resource degradation.¹²¹

Conservationists once focused exclusively on natural resource protection to the detriment of local people. It has since been recognized that active community participation is critical to the sustainable management and use of natural resources, for the benefit of both these resources and the communities they have historically sustained.

Liberian communities traditionally managed their surrounding natural resources according to customary codes that provided for communal ownership and regulation of access and responsibilities. However, the development of laws that assigned ownership of these same resources to the state, without recognizing their importance to community survival, has contributed to a conflict between subsistence needs and biodiversity conservation.¹²² The creation of protected areas that effectively excluded communities from resources to which they previously enjoyed access, without providing alternative sources of income such as tourism revenue, has exacerbated this situation.¹²³ Because a failure to address the subsistence needs that drive resource exploitation (such as the bushmeat trade) is likely to undermine the success of any biodiversity conservation strategy, successful legislation must balance community subsistence needs with the effective protection of forest and wildlife resources.

International Law. Liberia is a party to several international agreements that address community-based natural resource management. Article 14 of the Convention on Biological Diversity¹²⁴ obligates signing parties to promote public participation in environmental impact assessments for projects that are likely to have significant adverse effects on biological diversity. Article 4 of the UN Convention to Combat Desertification¹²⁵ requires signing parties to sustain and strengthen reforms toward greater decentralization and resource tenure and to reinforce the participation of local populations and communities in the fight against desertification. Additionally, Article 6 requires signatories to implement a consultative and participatory process for local communities and to provide these communities with strategies and guidance on their involvement. Finally, Article 8 of the Convention requires signatories to adopt national action programs aimed at ensuring the active involvement of local populations, communities, and groups in implementation measures, with an emphasis on education, training, and the mobilization of non-governmental organizations.

Summary of Liberian Law

Protected Areas. Although the 2000 Forestry Law removed virtually all of the language on community participation in protected areas management from

the 1988 Wildlife and National Parks Law, the 2006 Law added a provision addressing community livelihood needs in conjunction with the creation of protected areas. Specifically, Section 9.10(c) of the Law directs FDA to work with local communities, NGOs, and international organizations to provide alternative livelihoods for communities “adversely affected by the establishment or maintenance of Protected Forest Areas.” The 2006 Law also allows community resource use in several Category II protected areas. Pursuant to Section 9.1, and as defined in Section 1.3, FDA can designate Communal Forests for the sustainable, non-commercial use of forest products by local communities or tribes, and Multiple Sustainable Use Reserves for the sustainable use of forest resources, including subsistence uses.

In addition to the 2006 Forestry Law, Section 80 of the 2003 Environment Protection and Management Act provides for the establishment of community wildlife areas, which, though undefined by the Act, presumably allow some level of wildlife harvest. This section also directs EPA to develop conservation measures to ensure the co-existence of communities and wildlife in wildlife management areas. Finally, Section 75(4) of the Act directs EPA to take the interests of local communities into account when designating rivers, lakes, or wetlands as protected areas.

Forestry. The 2006 Forestry Law also includes a new chapter addressing community participation with respect to forest management. Chapter 10 (“Community Rights and Forest Management”) requires FDA to promulgate regulations that give local communities user and management rights, transfer to them control of forest use, and build community capacity for sustainable forest management (Sec. 10.1(a)). Regulations passed under this section must specify community rights and responsibilities with respect to forest resources; promote informed community participation in forest-related decisions; allow communities fair access to forest resources; and build community capacity to participate in, and benefit from, sustainable forest management (Sec. 10.1(b)). Another key provision of the 2006 Law directs FDA to develop a comprehensive law governing community rights with respect to Forest Lands by October 2007 (Section 10.1(c)).

In addition, Section 14.2(e)(ii) of the 2006 Law directs the Liberian government to allocate thirty percent of land rental fees (for the use of forest land) to affected communities. A proposed regulation to implement this provision (No. 106-6: Regulation on Benefit Sharing), which would establish a National Community Benefit Sharing Trust to allocate funds for community development activities, has undergone formal public review and comment and is expected to issue imminently.

Local Knowledge & Practices. Several provisions of the 2003 Environment Protection and Management Law allow for the incorporation of community knowledge into biodiversity management. Sections 83(1)(f) and 84(1)(f) direct EPA to issue guidelines and measures integrating traditional indigenous knowledge and practices into the conservation of biological diversity. Section 83(1)(e) instructs EPA to set out codes of general practice “to ensure respect and encouragement of the diverse cultural and aesthetic values and sacred knowledge and interests of the communities in biodiversity.”

County Environment Committees. Section 24 of the 2003 EPA Act provides for the creation of County Environment Committees, which are designed to help facilitate EPA’s activities at the county level. One of the committees’ explicit functions is to ensure that the environmental concerns of the county and local populations are integrated into all plans and projects approved at the county level (3(b)). The 2003 Environment Protection and Management Law gives the committees an active role in incorporating community input into natural resource management. This includes the identification and notification to EPA of rivers, lakes, and wetlands that are valuable to local communities or at risk from environmental degradation (Section 74(2)); the identification of areas for afforestation and reforestation (Section 78); the identification and notification to EPA of landscapes at risk from environmental degradation (Section 76); and the implementation of EPA-prescribed environmental measures at the community level in the areas of landscape degradation (Section 76), forest protection (Section 77), and protected natural environments (Section 79).

District Environment Committees. Section 26 of the 2003 EPA Act further directs County Environment Committees to establish District Environment Committees. These committees are

intended to monitor the environmental impacts of activities within the district, promote environmental awareness through information and public education campaigns, and work with communities to conserve natural resources, restore degraded resources, improve their natural environment, and preserve indigenous knowledge and cultural and spiritual values on biodiversity (Section 26(3)).

Analysis

*Communal Forests.*¹²⁶ Although the 2006 Forestry Law provides for the designation of Communal Forests that allow for the sustainable, non-commercial use of forest products by local communities or tribes (Secs. 1.3 & 9.9), FDA has not established, by regulation or otherwise, guidelines for creating such forests. A report prepared by the Liberia Forest Reassessment Project, “(Draft) Manual for the Establishment of Communal Forests in Liberia” (2004), explores the establishment of a Communal Forest (CF) system around Sapo National Park. The report addresses a number of issues surrounding CF designation, including who should be involved in the creation of CFs,¹²⁷ the roles and responsibilities of each participant, specific criteria for selecting CF areas,¹²⁸ guidelines for defining the CF community, and steps to take in piloting the creation of a CF.

The Draft Manual also highlights the need to clarify the legal status of community forest rights in Liberia, which have at various times been recognized in the form of communal forests, community forests, Tribal Reserves, and Native Reserves. As noted above, the 2006 Forestry Law does recognize Communal Forests. It also directs FDA to develop regulations that grant user and management rights to local communities, while specifying local communities’ rights and responsibilities. Other types of community forest rights have been recognized in prior legislation. The 1976 FDA Act authorizes the FDA to establish Native Authority Forest Reserves (Section 4(a)), though it is unclear whether any such reserves have been established. The Draft Manual also cites a provision on Tribal Reserves in Article 66 of the Revised Rules and Regulations Hinterland of Liberia (Section 5).¹²⁹

The work of the Liberia Forest Initiative to advance legal and policy reforms in the forest sector has helped to spark a national conversation on land

tenure issues, which are fundamental to the success of any new scheme for the sustainable use and management of the Republic’s forest estate.¹³⁰ The importance of land tenure reform is recognized in Section 87(f) of the 2003 Environment Protection and Management Act, which directs EPA to issue guidelines and prescribe measures to reform land tenure procedures.¹³¹ More information on land tenure issues in Liberia may be found in the Consultant’s Report, *supra* note 85, at 11-12.

Protected Areas. Affording communities a significant voice in the establishment and management of protected areas is a key way to promote respect for protected area boundaries and restrictions. The 2000 Forestry Law removed provisions in the 1988 Wildlife and National Parks Law that required local involvement and public participation in management plans (Section 15.2(j)); the creation of buffer zones around parks (Section 15.2(i)); and plans for the development of tourism (15.2(g)). The 1988 Act also required FDA to consult with local residents and take their views into account (such as through the optional establishment of a Local Advisory Committee) in the administration and management of protected areas (Section 26). Measures such as these form an integral part of community-based natural resource management by ensuring that protected areas address community needs and that communities, in turn, treat protected areas with respect.¹³² The 2006 Forestry Law does provide for public notice and comment on proposals by the FDA to establish new protected areas under Section 9.3. However, it does not address public participation in the administration and management of protected areas.¹³³ Liberia should consider restoring measures similar to those contained in the 1988 Wildlife and National Parks Law, and incorporating additional provisions to allow for meaningful community participation in the protected forest areas network retained in the 2006 Forestry Law.

Because the establishment of protected areas can cut off community access to natural resources, it is particularly important to provide alternative sources of income to prevent illegal resource exploitation. This may be accomplished through the development of ecotourism, including allocation of a portion of protected area user fees to community development projects and training local people for employment as guides and providers of food

and lodging; the designation of buffer zones to allow harvesting of certain resources (e.g., hunting, forest products extraction) by local communities; and small business development linked to the sustainable use of available resources. The 2006 Forestry Law takes a significant step in this direction by directing FDA to work with local communities, NGOs, and international organizations to provide alternative livelihoods for communities “adversely affected by the establishment or maintenance of Protected Forest Areas” (Section 9.10(c)). In addition, Liberia might consider developing a system for compensation of property owners whose land is taken for the creation of protected areas, as existed under Section 11 of the 1988 Wildlife and National Parks Act. While the 2006 Forestry Law authorizes compensation for any diminution in the value of a landowner’s property caused by the use of forest resources (Section 11.3), broadly defined to include all flora, fauna, and microorganisms in the forest environment (Section 1.3), it is not clear whether this would include all areas encompassed within the protected forest areas network.

Alternative Protein Sources. Another way to meet community subsistence needs and alleviate pressure on wildlife sources is through the development of alternative protein sources. The Wildlife Conservation Issue Paper¹³⁴ mentions several such projects, including participatory community wildlife farming, artisan (small-scale) fisheries, and larger aquaculture facilities. The paper highlights private sector wildlife farming projects in Nigeria, Benin, Togo, and Ghana¹³⁵ that illustrate the use of domesticated wildlife to help meet local needs (p. 28-29). The adequacy of designated hunting areas could also be explored. Although the 2006 Forestry Law allows hunting in both Communal Forests and Multiple Sustainable Use Reserves,¹³⁶ it remains unclear whether these areas are currently meeting community hunting needs, or whether the FDA should establish a scheme similar to the Controlled Hunting Reserves that existed under Section 28 of the 1988 Wildlife and National Parks Law.

Public Education and Awareness. Public education and outreach efforts about the impacts of biodiversity conservation are another important component of sound community-based natural resource management that can be incorporated into the

relevant legislation.¹³⁷ Education activities can help reinforce the understanding by rural communities of the benefits of sustainable resource use.¹³⁸ A well-developed public education and awareness campaign, undertaken in parallel with increased community participation in resource management, can help give communities a sense of ownership over their resources and the corresponding responsibility to manage them sustainably.¹³⁹

Community-Based Natural Resource Management: Environmental Information

Key data requirements

Ecologically positive outcomes require a high degree of social and economic empathy.

1. Social values: ideals and beliefs about nature and the environment to which people individually and collectively aspire and which they desire to uphold.
2. Conservation issues identified as a high priority by communities and stakeholder groups. Measures identified locally as potential solutions.
3. Identify the key adopter groups, including potential change agents.

Existing Data

(Quantity, quality, coverage, currency)

Darwin Initiative (Establishing community-based forest biodiversity management around Sapo National Park, Liberia): <http://www.darwin.gov.uk/projects/details/13008.html>.

Research Needs

1. Exploratory qualitative research to ascertain different world views, cultural symbols and beliefs, and issues relevant to the focus of the law or policy. Also, to identify the key adopter groups, including potential change agents.
2. A major dedicated survey on the issue concerned that is conducted by the local environmental movement, whether located in the university, NGOs or the responsible government department.

(6) Inland & Coastal Water Resources

Introduction. Although Liberia's biodiversity is associated most closely with its share of the Guinean Forests of West Africa hotspot,¹⁴⁰ the Republic's coastal and inland waters also support a wealth of plant and animal life. Wetlands such as Lake Piso, Gbedin, Kpatawee, Marshall, and Mesurado, all currently designated as Wetlands of International Importance under the Ramsar Convention,¹⁴¹ provide particularly valuable ecosystem services, including water filtration, flood control, and habitat for aquatic plants and animals, birds, and other wildlife.¹⁴² Local communities also rely on the resources sustained by these waters. Given the important role played by wetlands and watersheds in biodiversity protection, they should be preserved through inclusion in the protected areas network provided for under the 2006 Forestry Law, as well as through the regulation of pollutant discharges and other actions that affect water quality.

International Law. Several international agreements to which Liberia is a party address water quality and wetland ecosystems. The Ramsar Convention¹⁴³ requires signing parties to designate at least one national wetland for inclusion in a list of internationally important wetlands and to establish and manage nature reserves to promote the conservation of wetlands. Article VII of the African Convention¹⁴⁴ directs parties to maintain their water resources at the highest possible levels, by establishing and implementing policies for the planning, conservation, management, utilization and development of underground and surface water. Parties must also implement effluent and water quality standards to prevent the harmful discharge of water pollutants. Finally, Article VIII of the UN Convention to Combat Desertification¹⁴⁵ requires that signatories adopt national action programs that include provisions to ensure the integrated and sustainable management of water resources.

Summary of Liberian Law

Rivers, Lakes, and Wetlands. The 2003 Environment Protection and Management Law is the primary legal authority governing Liberian water resources. Section 74, "Management of Rivers, Lakes, and Wetlands," directs EPA to adopt measures addressing soil erosion, conservation of vegetation,

prevention and control of deliberate and accidental discharges, control and restoration of mining sites, sustainable harvesting of aquatic resources, and the promotion of ecotourism. Section 75, "Protection of Rivers, Lakes, and Wetlands," prohibits activities such as construction, excavation, deposits, blockage, draining, and the introduction of non-native plants and animals (75(2)); authorizes EPA to declare rivers, lakes, and wetlands protected areas and to impose measures to protect them from degradation (75(3)); and provides penalties in the form of fines or imprisonment for violations (75(6)).

In addition, Section 8.3(b) of the 2006 Forestry Law directs FDA to "identify and protect" wetlands on forest lands, and to require concession holders to identify and protect wetlands in their area(s) of operation. Finally, FDA Regulation No. 19 addresses water quality by prohibiting charcoal and fuelwood production in mangrove swamps and marsh forests along rivers and other watershed areas (Section I) and by establishing penalties for such violations, including confiscation or payment of the product's export value (Section IV).

Coastal Resources. Section 82 of the 2003 Environment Protection and Management Law authorizes EPA to designate coastal zones as protected areas and to impose restrictions to protect them from environmental degradation (82(1) & (2)); directs EPA to conduct a coastal zone survey and to prepare a management plan every three years to be incorporated into the National Environmental Action Plan (82(3) & (4)); and instructs EPA to issue appropriate regulations to prevent, reduce, and control pollution or other environmental damage and to protect the marine environment from a variety of pollution sources (82(6)). The law also specifies coastal zone prohibitions similar to those for rivers, lakes, and wetlands (82(7)) and stipulates fines and imprisonment for any violations of the above provisions (82(8)).

Water Quality. Regulation of water quality is an important component of biodiversity protection, as pollution and other forms of water quality degradation can directly harm aquatic species.¹⁴⁶ The 2003 Environment Protection and Management Law (Section 35) authorizes EPA to issue water quality standards for different uses including fisheries, wildlife, and coastal waters

(35(1)(a)); to enact guidelines for the preservation of fishing areas, aquatic areas, water resources and reservoirs, and other areas needing special protection ((35(1)(b)); and to take a variety of measures to regulate effluent discharges (35(1)(f)-(i)). Section 56 prohibits the discharge of hazardous substances, chemicals, and materials, including oil, into Liberia's waters except in accordance with EPA guidelines. Section 57 directs that effluent from trade or industrial undertakings be discharged solely into existing sewer systems, while Section 58 requires an effluent discharge license for owners or operators of trade and industrial undertakings, government ministries, and local authorities or bodies. Section 61 prohibits the dumping or discharge of pollutants into Liberian waters. Finally, Section 62 prohibits the disposal of solid waste on any land, coastal zone, or water surface, while Section 64 sets forth a license requirement for the disposal of solid and hazardous waste.

Analysis

Definitions. While the Environment Protection and Management Law requires that substantial steps be taken to regulate discharges and other activities that degrade water resources, some of its terms could be further defined to clarify who is subject to its requirements. For instance, although the prohibition on discharging hazardous substances applies to all persons (Section 56), effluent discharge licenses are required only for owners and operators of trade and industrial undertakings and ministries or local authorities operating a sewer system (Section 58). The law does not define industrial undertakings, and it defines "trade" vaguely to include "any trade, business, or undertaking . . . which may result in the discharge of substances and energy and includes any activity prescribed to be a trade, business or undertaking for the purposes of this Law" (Section 3). Such a definition could give rise to both an overly broad and an overly narrow interpretation that may hamper EPA's efforts to effectively regulate effluent discharges. In defining these terms more specifically, EPA could consider identifying the specific activities that currently constitute the main sources of water degradation in Liberia (for example, sewage treatment, fuel storage, and mining),¹⁴⁷ while clarifying that the scope of the license requirement is not limited to these activities. This could help ensure that

significant discharges of effluent that harm water quality and aquatic life will be regulated.

Another potentially problematic term is "hazardous substance" under Section 56, which is defined to mean a chemical, waste, gas, liquid, or other material that is harmful to human health and the environment (Section 3). Because this broad definition leaves substantial discretion to EPA in determining what constitutes a hazardous substance, the agency should promulgate regulations that clarify the scope of the term while still providing for coverage of harmful substances generally. Ensuring regulation of the discharge of hazardous substances will help protect aquatic plants and animals from serious degradations in water quality.

Discharges. Regulation of effluent discharges in Liberia is provided for by Sections 57-60 of the 2003 Environment Protection and Management Law. While the law sets forth important components of the licensing process, gaps remain. These include application requirements for effluent discharge licenses and standards for the granting or denying of such applications. Another issue concerns the feasibility of the requirement that effluent only be discharged into an existing sewerage system. In practice, the only potentially functioning sewer system at press time is located in Monrovia (thus limiting discharge licenses to areas served by this system), and it is already overburdened by users, illegal connections, and groundwater infiltration.¹⁴⁸ It is unclear how the sewerage hook-up requirement can realistically be implemented without causing significant environmental harm, which can in turn harm aquatic species and ecosystems.

Other. Because the water quality requirements are spread across a number of different sections in three separate Parts under the 2003 Environment Protection and Management Law, these sections should cross-reference each other for clarification. In addition, many implementing regulations remain to be developed. Until this is done, EPA will be unable to implement the permitting and other requirements spelled out in the law, thus leaving aquatic species and habitats vulnerable to unregulated, potentially harmful discharges. In developing these regulations, EPA should consider addressing more specifically those operations that pose specific threats to water quality, including but not limited to sewage treatment, fuel storage, and mining.

(7) Biotechnology & Biosafety¹⁴⁹

Introduction. Broadly defined as “the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services,”¹⁵⁰ biotechnology can help preserve biodiversity by increasing knowledge about genetic diversity and by increasing farm yields to reduce pressure on native habitats.¹⁵¹ This section focuses on one subset of biotechnology products known as genetically modified organisms, or GMOs. Biotechnology applications hold great potential to help countries increase their production of food, feed, and renewable raw materials; improve human health; enhance environmental protection; and enhance safety.¹⁵² At the same time, significant information gaps in biotechnology knowledge remain, particularly with respect to how modified organisms can affect the environment.¹⁵³ There is also widespread concern that bioengineered products could pose serious potential risks to ecosystems, as well as human and animal health.¹⁵⁴ Together, the rapid growth of the biotechnology field, and the existence of such potential risks and gaps, point to the need for regulatory oversight at the national level. While there may be a question as to whether biotechnology currently poses a concern in Liberia, the well-developed international legal framework, and Liberia’s status as a party to several agreements, suggest that the issue may warrant some discussion.

International Law. Liberia is party to several international environmental agreements that contain provisions on biotechnology and biosafety.¹⁵⁵ Article 8 of the Convention on Biological Diversity¹⁵⁶ requires parties to establish or maintain a system to regulate, manage, or control the risks associated with the use and release of living modified organisms that are likely to have adverse environmental impacts on biological diversity. The Convention also establishes guidelines for the handling and distribution of biotechnology. Specifically, Article 19 of the Convention requires parties to adopt legislative, administrative, and policy measures to provide for effective participation in biotechnological research. Article 19 also obligates parties to promote and advance “priority access” to the results and benefits arising from biotechnological research. In addition,

Article IX of the African Convention¹⁵⁷ mandates that signing parties provide fair and equitable benefit sharing of biotechnology products based upon genetic resources and related traditional knowledge with the providers of such resources and knowledge. The Cartagena Protocol on Biosafety¹⁵⁸ directs parties under Article 2 to ensure that the development, handling, transport, use, transfer, and release of any living modified organisms is undertaken in a manner that prevents or reduces the risks to biological diversity, while taking into account risks to human health. Finally, Article 8 of the Cartagena Protocol requires countries of export to notify countries of import prior to the intentional transboundary movement of a living modified organism.

Analysis

Since Liberia lacks domestic legislation relating to biotechnology and biosafety, a framework law could be adopted that incorporates essential protections until EPA or another appropriate in-country institution can develop more detailed regulations. The UNEP Guidelines call for national biosafety frameworks to help identify how biotechnology is being used within a country, develop mechanisms to regulate the actual and potential uses of biotechnology, identify biotechnology hazards, and minimize harm to human health and the environment.¹⁵⁹ The Guidelines start with the premise that adequate mechanisms for risk assessment and risk management are central to promoting biotechnology safety.¹⁶⁰ These are related concepts: risk assessment helps identify the existence and level of risk, while risk management provides tools to minimize the risk posed by a particular organism.¹⁶¹ Although biotechnology may not be viewed as a significant issue in Liberia, the country’s import of food and live animals suggests that a regulatory framework may be desirable at some point.

Risk Assessment. Risk is defined as the likelihood that an organism introduced into the environment may cause harm to that environment.¹⁶² There is general consensus that risk assessments for biotechnology organisms and products should be based on the “precautionary principle,” which holds that a lack of scientific certainty about the level of risk posed should not be equated with either lack of risk or acceptable risk.¹⁶³ A basic procedure

for risk assessments proposed by the Third World Network would require that the applicant who seeks to bring an organism or product into the country prepare a report assessing the impacts and risks posed to human and animal health, as well as biological diversity and the environment. The governing authority (possibly through a panel of experts) would then evaluate the report, based on detailed risk assessment parameters. The reviewing panel may in turn decide to carry out a further assessment of risk. Following the evaluation, the reviewing authority would prepare a report setting forth the issues for evaluation, its decision, and the grounds on which it relied.¹⁶⁴

Risk Management. Once a certain level of risk has been identified, risk management comes into play. This consists of a process for “identifying, evaluating, selecting, and implementing actions to reduce risk to human health and to ecosystems.”¹⁶⁵ Risk management methods may include monitoring prior to or after release; restricting or prohibiting the import, release, contained use, or placing on the market of any modified organisms or related products; ordering the cessation of activities in order to prevent or limit harm; requiring measures to prevent harm to biodiversity or the environment, or to restore the environment; and taking emergency measures.¹⁶⁶ A country should be able to impose these requirements when issuing an approval and at any time generally.¹⁶⁷

Other Elements. Other elements comprising an effective biosafety framework law include notice and opportunity for public comment during risk assessment and evaluation; safeguards for the review of decisions; the application of strict liability for any damage caused by introduction of an organism or product; a list of prohibited activities and penalties; institutional arrangements such as the designation of a competent authority and independent body of experts; and authority to enact regulations.¹⁶⁸

Biotechnology and Biosafety: Environmental Information Genetically Modified Organisms

Key data requirements

1. Risk Assessment: Data is required that will enable an objective assessment of potential

damage caused to biodiversity and the wider environment by the release of a GMO.

2. Monitoring: This should confirm that the environmental risk assessment was correct and identify the occurrence of adverse effects of the GMO or its use on human health and the environment which were not anticipated in the environmental risk assessment.

Existing data

Risk assessment: Environmental risk assessment of genetically modified organisms is a complex and rapidly changing field. To date, there is no international standard for comprehensive scientific methods for the pre-release testing and post-release monitoring of transgenic organisms to ensure their environmental safety and sustainable use. The International Organization for Biological Control has established projects to develop a series of biosafety testing guidelines for transgenic plants.¹⁶⁹ These provide a useful template for identifying key issues and information requirements.

Living genetically modified organisms intended as food or feed products (LMOFFPs) that will be released into the environment are required, under the Cartagena Protocol, to undergo an advance informed agreement (AIA) procedure. This should, in principle, mean that there is adequate information available for performing or auditing a risk assessment. The Cartagena Protocol does not cover the cultivation of GM crops either for domestic commercial use or for experimental purposes. The Biosafety Clearing-House, established under the auspices of the Cartagena Protocol, serves as an information repository on the scientific, technical, environmental and legal aspects of living modified organism (LMO) risk assessment. It can be accessed at <http://bch.biodiv.org/>. The website provides a central registry of all LMOs for which decisions on risk have been taken. The registry provides summary information on the transformation event, gene insert and characteristics of the modification for approved LMOs.

If developer-derived scientific information is used for regulatory approval or risk assessment, it should be required to be peer-reviewed.

Existing capacity and capacity-building

The Ministry of Agriculture's National Quarantine and Environmental Services (NQES) is responsible for most issues concerning biosafety in Liberia. In many countries, biosafety issues are dealt with on a sector-by-sector basis. This has resulted in animal health, plant health, invasive species and GMO issues being handled separately, often by entirely separate secretariats. However, there is a growing recognition that biosafety would profit from a more integrated approach.¹⁷⁰ To this end, the concentration of expertise and regulatory capacity in the NQES would be an advantage.

Liberia does not have an established biotechnology industry, and there is no evidence that LMOs are currently used in-country. It would therefore make sense for biosafety efforts to be focused on developing sufficient in-country expertise to evaluate risk assessments and advance informed agreements (AIA). Careful control of imports should ensure that Liberia benefits from new products and enhanced agricultural yields without a significant risk of severe impacts on biodiversity or the environment. NQES should be supported in its role of promulgating a national biosafety framework, but it should not be expected to design and review such policies. There would be merit in establishing a national biosafety advisory committee, which might, initially at least, co-opt expertise not available in-country.

If and when LMOs become more widespread in Liberia, it will be necessary for the country to develop monitoring capacity. The type of monitoring that will be required will depend very much on the risk assessment associated with each GMO. Guidelines for monitoring have been drawn up for the UK¹⁷¹ and by the European Food Safety Authority,¹⁷² and may serve as useful templates.

Liberia does not currently have adequately equipped diagnostic services. However, national capacity in this regard is less urgent, since these services can be procured on the basis of tenders from countries in the region.

(8) Access to Genetic Resources

Introduction. Genetic diversity, species diversity, and ecosystem diversity are the fundamental components of biological diversity. Genetic

resources are defined under Article 2 of the Convention on Biological Diversity as "genetic material of actual or potential value," with genetic material including "any material of plant, animal, microbial or other origin containing functional units of heredity," or DNA. Throughout Africa, genetic resources play a fundamental role in agriculture, medicine, and public health, with potential application to a wide range of industrial uses.¹⁷³ While genetic resources hold significant commercial potential, this does not necessarily ensure their conservation, in part because once the genetic component is initially harvested, raw materials are no longer needed.¹⁷⁴ Nonetheless, these resources may provide important alternative sources of income for rural communities, particularly at the local level.¹⁷⁵ The management and sustainable use of genetic resources raises a number of legal issues, including questions of intellectual property rights, benefit sharing, and the proper balance between traditional and contemporary concepts of "access." It is important that regulation in this area strike a balance between restricting uncontrolled access and enabling access for research that can contribute to food security and other public uses.

International Law. Liberia is a signatory to several international environmental agreements containing provisions on access to genetic resources and benefit sharing. Article 15 of the Convention on Biological Diversity,¹⁷⁶ the most prominent agreement on this topic, requires parties to facilitate access to genetic resources for environmentally sound uses, obtain "prior informed consent" of a Contracting Party (the party providing access to genetic resources), and develop and carry out scientific research based on genetic resources provided by other contracting parties. Article 8(j) of the Convention encourages equitable sharing of the benefits arising from the utilization of knowledge, innovations, and practices of indigenous and local communities "relevant for the conservation and sustainable use of biological diversity." Similarly, Article IX of the African Convention¹⁷⁷ directs parties to provide fair and equitable access to genetic resources on terms mutually agreed between the providers and users of such resources. Finally, Articles 7, 8, 13, and 18 of the International Treaty on Plant Genetic Resources for Food and Agriculture¹⁷⁸ promotes benefit sharing through information exchange, technology transfer, capacity building,

and the sharing of financial benefits as a result of commercialization. Part IV of the Treaty also establishes the Multilateral System (MLS) of Access and Benefit-Sharing, which allows access to listed species in accordance with specified conditions for benefit sharing that are triggered by commercial use of a product followed by restrictions on access or use of that product.

Summary of Liberian Law

Environment Protection and Management Law. Section 86 of the 2003 Environment Protection and Management Law requires EPA to initiate legislative proposals, issue guidelines, and prescribe measures for the sustainable management of genetic resources, including measures governing arrangements for access to genetic resources by non-citizens or non-residents (86(1)(a)); prior informed consent (86(1)(b)); equitable sharing of benefits and sustainable transfer of biotechnology (86(1)(c)); regulation of trade or traffic in biological diversity (86(1)(e)); patenting requirements for indigenous species (86(1)(g)); and the collection, evaluation, and documentation of plant genetic resources for food, agricultural, and medicinal purposes (86(1)(h)). In addition, Section 8.3(e) of the 2006 Forestry Law directs the FDA to establish a central seed bank¹⁷⁹ and other aids to forest tree culture, where necessary.

Analysis¹⁸⁰

Definitions. The definitions of many terms set forth in Section 86 would benefit from further clarification, including “appropriate arrangements” under subsection 1(a); “prior informed consent” and “bio-prospecting” under 1(b); “effective equitable sharing of benefits” under 1(c); and “trade or traffic” under 1(e) (which, for instance, could be improved by stating whether this includes both domestic and international trade).¹⁸¹ Another question is whether “indigenous property rights” under 1(d) are currently defined. The African Model Law provides several examples of these definitions. In addition, although the 2003 Law defines “genetic resources” as “genetic material of actual or potential value,” consistent with the CBD’s definition, the law does not in turn define “genetic material.” It is extremely important to define precisely what constitutes a “genetic resource” and hence is subject to the regulatory scheme.

Prior Informed Consent. A complete law or regulatory system should elaborate what constitutes prior informed consent and how this consent is to be sought and given, including procedures for consultation, the establishment of mutually agreeable terms, and the right of a community to refuse, withdraw, or place conditions on access. Consent could be required from both the national government and the affected local community. The Bonn Guidelines (p. 9-11) list a number of elements of a prior informed consent system, including the identification of competent authorities that can grant or provide evidence of prior informed consent; timing and deadlines for obtaining prior informed consent; the specification of uses for which consent is given; and requirements for mutually agreed terms governing the sharing of knowledge and resources.

*Benefit Sharing.*¹⁸² Benefit sharing is a fundamental component of access agreements between institutions and groups who seek access to genetic resources and the nations, communities, and property rights holders with control over such resources. While the Environment Protection and Management Law mentions this concept, additional detail would be helpful. Relevant issues to be considered include the establishment of mutually agreed terms regarding the conditions, obligations, procedures, types (monetary and non-monetary), timing (near-term, medium-term, and long-term), distribution, and mechanisms of benefit sharing (Bonn Guidelines at 14). With respect to mechanisms for benefit sharing, the law could address the payment of fees for a use permit, the sharing of product revenue with the community, technology transfer, and joint research and development, among other things. Appendix II of the Bonn Guidelines provides a more complete list of the types of monetary and non-monetary benefits that could be provided, including access fees, royalties, salaries, research funding, sharing of research and development, participation in product development, institutional capacity-building, education and training, and access to scientific information on biodiversity, among other things.

Permitting. Existing Liberian legislation does not address permitting issues. These include the submission of an application to access genetic resources or local technology and knowledge,

the solicitation of public comments on the application, and standards for evaluating the application. Other relevant issues include options for granting or denying an access permit; an explanation of the types of permits that may be granted; requirements concerning the contents of access agreements, including benefit sharing; authority to revoke a permit; and provisions for appealing permit decisions. Finally, the legislation might provide for restrictions on the use of genetic material, including the trade, export, or transfer to another party of such material.

Intellectual Property Rights. The treatment of intellectual property rights is another key concept that might be addressed through comprehensive legislation on genetic resources. Together, the African Model Law and Bonn Guidelines establish important principles, including permit restrictions that prohibit the seeking of property rights over shared resources, as well as an outright statement that patents over life forms and biological processes are not recognized and cannot be sought. These documents also encourage disclosure of the country of origin and of traditional knowledge on patent and other applications. Another area concerns community intellectual rights, which could be made subject to legal recognition and protection, taking into account traditional norms, practices, customs, and use. Finally, benefit-sharing agreements might also be extended to encompass the joint ownership of intellectual property rights.

Institutional Arrangements. Certain institutional arrangements should be established in order to properly regulate access to genetic resources. The Model African Law recommends the creation of a National Competent Authority to coordinate the permitting process, facilitate consultation and participation by local communities in this process, and develop a system for identifying and recognizing community intellectual rights and farmers' rights.¹⁸³ The model law also recommends the establishment of a National Intersectoral Coordination Body to help implement laws regarding access to genetic information; a National Information System to collect and maintain information on community intellectual rights, farmers' rights, research and development activities, and piracy of biological resources; and a Community Gene Fund, supported by

contributions from national and international bodies, to finance genetic resource projects at the community level.

Enforcement. Although Section 112 of the Environment Protection and Management Law specifies general penalties for violations of Section 86 (among others), the law could also include more specific provisions to enforce the requirements surrounding the permitting process for access to genetic resources, in addition to imposing restrictions on the introduction of biological resources generally. Examples of enforcement measures include written warnings; fines; cancellation/revocation of access; confiscation of biological specimens and equipment; a permanent ban on access to biological resources, community knowledge, and national technologies; and publication of the violation. Such measures can help ensure that community rights are respected and that countries and their stakeholders share equally in the benefits derived from the use of their genetic resources by outside parties.

(9) Environmental Impact Assessment

Introduction. Environment Impact Assessment, or EIA, constitutes the backbone of the environmental review process for projects that may have a significant impact on the environment.¹⁸⁴ The importance of EIA derives not only from its required disclosure and analysis of a project's likely environmental effects, but also from the role it affords the general public for participation in the environmental review process – a role that can generate important information about a project's adverse impacts. Because EIA requirements are not limited to protected areas, the development and implementation of a functional EIA procedure is essential for safeguarding biodiversity throughout the country, including areas that do not fall under Liberia's protected areas network.

International Law. Liberia has ratified and accepted several international agreements that require signatories to undertake environmental impact assessments (EIAs). For example, Article 4(f) of the UN Convention on Climate Change¹⁸⁵ requests that parties acknowledge climate-change considerations when forming social, economic,

and environmental policies and that they employ appropriate methods, such as impact assessments, to mitigate or adapt to climate change. Article 14 of the Convention on Biological Diversity¹⁸⁶ requires parties to compile an EIA for projects “that are likely to have significant adverse effects on biological diversity” in order to avoid or minimize those effects. Finally, while not explicitly calling for an EIA, Recommendation 1.6 of the Ramsar Convention¹⁸⁷ requires signatories to evaluate the possible direct, indirect, and cumulative impacts of proposed project activities in protected areas, on species, and on their associated systems.

Summary of Liberian Law

Part III of the 2003 Environment Protection and Management Law establishes a fairly comprehensive framework for Environmental Impact Assessment, including procedural and substantive standards for the approval or rejection of projects, provisions for public participation, and procedures for appeals of agency decisions.¹⁸⁸ The key elements of this framework are briefly described below.

General Overview. Liberia’s EIA process contains both procedural and substantive requirements. Annex I provides a list of projects for which an environmental impact assessment license or permit is required pursuant to Section 6. Under Section 8, project proponents must submit a project brief that describes the project and its projected impacts on land, air, and water. Based on an evaluation of the project brief, EPA then decides whether to require preparation of an environmental review or an environmental impact statement, or, conversely, to issue a “finding of no significant impact” and a certificate of approval (Section 8(4)). After soliciting public comments and holding a public hearing, the agency reviews the environmental impact statement and issues a decision to approve, deny, or conditionally approve the project (Section 21). The agency may also refer the application back for further study or submission of information. After implementation of a project, EPA must still conduct monitoring (Section 24) and regular environmental audits (Section 25) to ensure compliance with the EIA requirements. The EIA process can help disclose a project’s potential adverse impacts on species and ecosystems and lead to measures to mitigate these adverse impacts, before the project has been implemented and the harm has already occurred.

Environmental Review. Section 12 requires the preparation of an “environmental review” for projects or activities that may have a significant impact on the environment. This Section directs EPA to promulgate guidelines specifying the content and format of environmental reviews and the procedures to be followed in evaluating the review. The review must contain sufficient information to enable EPA to decide whether to require a full environmental impact study.

Environmental Impact Study. An “Environmental Impact Study,” and the subsequent preparation of an “Environmental Impact Statement” (EIS),¹⁸⁹ are required for projects that will have, or are likely to have, a significant impact on the environment and that do not include sufficient mitigation measures (Section 8(4)(b)). Section 14 sets forth a list of elements that must be included in the EIS, including, among others, alternatives to the project and why they were rejected (14(1)(c)); an evaluation of the project’s direct, indirect, cumulative, short-term, and long-term effects on the natural and built environments and on public health and safety (14(1)(e)); identification of the gaps and uncertainties in information (14(1)(i)); and a description of measures to avoid, minimize, mitigate, and monitor the project’s anticipated adverse environmental effects (14(1)(f)).

Public Participation. The law provides for public participation at a number of points in the environmental review process. These include public consultation during the scoping process (Section 11); public comment on environmental impact statements (Sections 16 & 17); a public hearing upon a request by five or more persons, or upon a determination that controversy over the project necessitates such a hearing (Section 18); the inclusion of at least one person in the EIA review committee from the area that will be affected by a project (Section 20); the right to appeal unfavorable agency decisions (Section 30); and public access to all EIA documents (Section 33).

Review of Decisions. Section 30 creates a right for any person “aggrieved” by EPA’s decision to issue or refuse to issue a license to request reconsideration, and to take an appeal from EPA’s decision on reconsideration.¹⁹⁰

Enforcement. Pursuant to Section 105, any person who fails to publish a notice of intent, submit a project brief, conduct a scoping process, prepare an EIS, or prepare an environmental mitigation and implementation strategy in conformance with the applicable provisions may be imprisoned for up to 10 years and/or fined up to USD 25,000. These penalties also apply to the fraudulent making of a false statement on any documents submitted as part of the EIA process.

Analysis

While Liberia's EIA procedures are fairly comprehensive, regulations are needed to flesh out the various requirements and provide more detailed definitions of their terms. It remains to be seen how the EIA process will actually be implemented on the ground. Unless and until such implementation occurs, the large number of projects listed in Annex I may be free to move forward without any assessment (or mitigation) of their impacts on biodiversity.

Scope. The decision to list all activities requiring an EIA license or permit under Annex I may make the EIA process easier in some respects but more difficult in others. On the one hand, by clarifying the activities to which the EIA requirement applies, this approach may forestall confusion and legal challenges with respect to the scope of the EIA process. On the other hand, some of the descriptions are quite vague, most of them should be further defined, and the catch-all provision employed under Section 26¹⁹¹ of Annex I is so broad, and leaves so much discretion to EPA, that it could include almost any activity.

While virtually all of the activities listed in Annex I would benefit from further clarification through regulations, examples of particularly broad terms include "livestock routes" (Section 2), "pest management" (Section 3), "hunting" (Section 5), "hunting and capturing" and "camping activities, walk ways and trails etc." (Section 6), and all of the activities listed under Section 25 (Policies and Programmes). In addition, while the EIA requirement appears to extend to activities implemented by both the Government and private entities, the law could clarify this and address any practical distinctions between the two actors that may affect the implementation of these requirements.

Public Participation. While the law contains a number of safeguards to allow for public participation in the EIA process, it does not provide for public comment on environmental reviews (as opposed to environmental impact statements). Such input is particularly important, since these reviews are used to determine whether a full EIS will be required for a project based on its projected environmental impacts. Regulations could be used to develop the procedures for public consultations during the scoping process (Section 11) and for making documents available to the public "in a timely and prescribed manner" (Section 33). The law also does not define "affected stakeholders" or "interested parties" under Section 11, or "the public" under Sections 16-18— leaving it unclear as to who is entitled to participate in the review process. Finally, the law lacks a requirement that EPA release a draft version of the environmental impact statement for public review and comment before preparing a final statement and deciding whether to issue a license or permit. Soliciting public comment on a draft version would allow EPA to identify and respond to issues of concern before the statement becomes final.

Environmental Impact Statements. Although Section 14 requires EISs to include discussion of a project's impact on the environment, which is defined under Section 3 to encompass land, water, plants, and animals, this Section should also require discussion of impacts on biodiversity in particular, especially since the law defines biological diversity under Section 3. Currently, the only relevant reference to this concept in Section 14 is a requirement to address anticipated ecological effects (Section 14(1)(k)). In addition, while the EIS must include a description of alternatives to the project and an explanation of why they were not chosen (14(1)(c)), there is no requirement that the EIS analyze the environmental effects of the proposed alternatives. There is also no requirement that the EIS analyze a "no-action" alternative. Finally, Section 15 might define "any adverse effects on the environment" so as not to require environmental mitigation for *de minimis* impacts.

A more fundamental issue concerns the absence of a statutory definition for "significant impact on the environment" under Section 12, which is the trigger for a complete environmental impact study. As a result, it will likely be very difficult to determine which activities require such a study, along with the associated Environmental Impact Statement.

Review of decisions. Although Section 30 allows aggrieved persons to request reconsideration of EPA's decision to grant or deny a license, the term "aggrieved" might be further defined to clarify who may seek review. For instance, does aggrieved mean anyone who disagrees with the decision, or is it limited to those who can show that they will be harmed in some manner (e.g., that they have legal "standing" to challenge the decision)? As noted in footnote 190, *supra*, it should be clarified under Section 30(3) that only decisions of EPA upon reconsideration may be appealed to the Environmental Court; otherwise, this would nullify the requirement to seek reconsideration under Section 30(1). It is also important to note that until the Environmental Court is established, Section 30 provides no meaningful review of the decision to grant or deny an EIA license.

(10) Information and Research

Introduction. Sound information and research must underpin any successful legal and scientific framework for biodiversity conservation. The identification of ecologically valuable species and habitat, the threats posed to them, and measures required to conserve and restore them is necessary in order to establish protected areas, safeguard wildlife and rare species, assess and monitor environmental impacts, implement long-term planning efforts, and inform the development of conservation and management laws generally. The sharing of data between different sectors (e.g. forestry, protected areas, and species) and levels of government (national, local) is especially important to its effective application at the policy level.

International Law. Liberia is party to numerous international agreements that address the role of research and information in biodiversity conservation and use. Article 8 of the Convention on Biological Diversity¹⁹² requires parties to "respect, preserve, and maintain" traditional knowledge relevant to the conservation and sustainable use of biodiversity, while Article 17 directs parties to facilitate the exchange of information with respect to biodiversity conservation and use. Under Article 8 of CITES,¹⁹³ signatory parties must prepare and make available to the public annual reports concerning their progress in implementing CITES, while the Strategic Plan calls for information and

data exchange with other relevant conventions, agreements, and associations. Similarly, the UN Convention to Combat Desertification¹⁹⁴ requires parties to coordinate the collection, analysis, and exchange of relevant data concerning land degradation, in order to better understand the effects of drought and desertification. Under the African Convention,¹⁹⁵ signatories are to promote conservation research, while Article 4 of the UN Convention on Climate Change¹⁹⁶ directs signatories to promote and cooperate on scientific, technological, and socioeconomic research with respect to climate change. Finally, the International Tropical Timber Agreement¹⁹⁷ directs parties to facilitate the transfer of knowledge in the fields of reforestation and forest management.

Summary of Liberian Law

Inventories. Both the 2003 Environment Protection and Management Law and the 2006 Forestry Law require their respective agencies to conduct biodiversity inventories. Section 83(1)(b) of the 2003 Environment Law directs EPA to identify, prepare, and maintain an inventory of biological diversity in Liberia, while Section 82 requires EPA to prepare an inventory of marine fisheries, turtles, and whales, including harvesting and licensing activities, as part of a periodic coastal zone survey. Section 9.1(b) of the 2006 Forestry Law directs FDA to undertake research on wildlife distribution, habitat, and population, which is presumed to form the basis of a list of threatened and endangered animals.

Direct Research. Provisions concerning direct research are found in the 2006 Forestry Law, the 2003 Environment Protection and Management Law, and the 2003 EPA Act. Section 16.1 of the 2006 Forestry Law ("Forestry Research") directs FDA to encourage scientific research and education on forestry, specifically concerning natural forest improvement, plantation management, wildlife conservation, and forest products. Section 35(c) of the 2003 Environment Protection and Management Law charges EPA with identifying areas of research, and conducting or commissioning such research, on the effects of water pollution on the environment, human beings, fauna, and flora. Section 100 directs EPA to gather, analyze, and disseminate to public and private users information on the environment and natural resources. Within the 2003 EPA Act, Section 30(2)(c) requires EPA, as

part of the National Environmental Action Plan, to recommend areas for environmental research and outline methods to utilize collected information. In addition, Section 6(c) directs EPA to collect, analyze, and prepare basic scientific data; undertake research; and prepare a report on the state of the environment every two years.

Other. Several other provisions of the 2003 Environment Protection and Management Law address the collection of environmental information. Under Section 103, EPA is to publish a State of the Environment Report every five years, specifying the main activities of EPA and the line ministries regarding environmental protection at the national, county, and district levels. Section 83(1)(h) directs EPA to gather data on the roles of women and youth in the conservation of biological resources and the impact of natural resource policies on women and youth. In addition, Sections 83(1)(f) and 84(1)(f) address the integration of traditional or indigenous knowledge with mainstream scientific knowledge.

Analysis

Definitions. The research directives contained in the EPA laws, while an important first step, might be further defined to clarify their scope. For instance, Section 100 of the Environment Protection and Management Law charges EPA with gathering, analyzing, and disseminating to the public information on the environment and natural resources. It may be helpful to list the topics that fall under these broad concepts, such as fauna and flora, microorganisms, invasive species, genetic resources, and ecosystems. The law should also specify the type of information to be collected, such as data, specimens, pictures, and maps.

Inventories. The EPA and FDA laws requiring biodiversity, marine, and wildlife inventories could also provide more information about the scope of the inventories, how often they should be conducted, accepted methodologies for collecting and maintaining data, and how the information gathered will be used (e.g., the purpose of the inventory). It would also be useful for such laws to encourage or require that the inventories be conducted in partnership with national research institutions. The scope of the inventories could also be expanded to include

the mapping of sacred forests and any other traditional practices that protect biodiversity.

Inventories or surveys might also be used to gather more information about Liberia's participation in the exotic pet trade (discussed under Section 2, Trade in Species). In particular, data on the location of the exotic species trade, the primary actors involved, and their motivations for possessing or trading exotic species could be used to design appropriate awareness campaigns to educate the public about the environmental and health risks posed by this activity.

Coordination. Although the Environment Protection and Management Law is a framework law, it does not squarely address the question of whether a single agency should manage the collection and storage of all biodiversity information. A consolidated data management system might help promote the consolidation of information and the use of uniform standards in data collection, storage, and maintenance; facilitate linkages with national research institutions; integrate data on wildlife, protected areas, coastal zones, and other ecologically significant species and regions; and draw upon data gathered by nongovernmental organizations. Regardless of whether a single agency is assigned responsibility over and custody of all biodiversity research and information, steps might be taken to develop standards for gathering, storing, and using data, and to ensure that this information will be shared between agencies, as well as with the public, to the greatest extent practicable.¹⁹⁸

Application. Effective legislation could direct the consistent use of biodiversity information across sectors, including in the preparation of biodiversity, land use, and wildlife conservation plans; the EIA review process; and the establishment of protected areas. This information could be used at both the national and local level.

Public Participation. Although the laws direct EPA to integrate traditional indigenous knowledge and practices into biodiversity conservation, these provisions could allow for more direct public involvement in biodiversity research and the collection of information. Participatory community assessments are one way to involve communities in information gathering and to

ensure that community viewpoints are addressed in biodiversity conservation efforts. Other means to encourage community participation include the hiring of local members for research and data collection and the use of community interviews as an information collection tool. In short, community participation can generate better biodiversity information while incorporating community perspectives into biodiversity conservation and management plans.¹⁹⁹

(11) Planning

Introduction. Planning is one of the most important legal tools for effective biodiversity conservation.²⁰⁰ Comprehensive biodiversity planning helps a nation to see the “big picture” by coordinating consideration of interactions between air, water, soil, geology, plant and animal taxa, and ecoregions. Elements of a comprehensive biodiversity plan include the identification of threats to biodiversity and the most effective tools for addressing those threats, institutions and funding mechanisms, and implementation methods. More particularly, the plan should identify the location of lands or other areas essential to biodiversity protection (including “hot spots” and locations of rare, threatened, and endangered species), specify a system for prioritizing these areas, and detail how to link each area to particular conservation methods. Biodiversity planning should also include, or at least address, the role of zoning and land-use planning in land management and conservation, including adaptive management.

International Law. Liberia has acceded to two international agreements that address the role of planning in the conservation of biodiversity. Article 8 of the UN Convention to Combat Desertification²⁰¹ requires parties to establish national action programs that promote integrated and sustainable biodiversity, while Articles 9 and 10 call for the establishment of national action programs that will identify long term strategies to combat desertification and mitigate the effects of drought. In addition to the UN Convention, Article XIV of the African Convention²⁰² requires signatories to include in their regional or national plans methods to ensure the conservation and management of natural resources.

Summary of Liberian Law

National Forest Management Strategy. The 2006 Forestry Law incorporated a new planning requirement, the National Forest Management Strategy, which is intended to integrate the National Forest Policy with existing national land, economic, and development plans (Sections 4.3 & 4.4). Under the Strategy, FDA is to classify all forest lands according to their legal status and potential use, such as commercial use, conservation, or community forestry. Before committing any of these areas to a proposed land use, FDA must “validate” them by collecting and analyzing local forestry, ecological, and socioeconomic data and by preparing a written report on their suitability (Section 4.5).

National and Local Environmental Action Plans. The 2003 EPA Act delineates planning responsibilities at both the national and local level. At the national level, EPA’s planning activities are largely encapsulated in the National Environmental Action Plan, which the agency is required to prepare every five years pursuant to Section 30 of the Act. Among other things, the Plan must provide general guidelines for managing and protecting Liberia’s environment and natural resources and recommend policy and legislative approaches for preventing, controlling, or mitigating adverse impacts on the environment ((2)(a),(f)). The plan is to serve as the basis for national environmental planning and development programs and is binding on all ministries, public organizations, agencies, companies, NGOs, and persons ((2)(b); (3)). The National Environmental Action Plan is also referenced in Section 83(1)(a) of the 2003 Environment Protection and Management Law, which requires EPA to specify national strategies, plans, and programs for the conservation and sustainable use of biological diversity as part of the Plan.

At the local level, County Environmental Committees must prepare a County Environment Action Plan that conforms to the National Plan every five years, under Section 31 of the 2003 EPA Act.

National Coastal Zone Management Plan. The only ecosystem-specific planning requirement in the 2003 Environment Protection and Management Law is found in Section 82, which requires EPA to prepare a national coastal zone management plan every three years, after consultation with the relevant ministries and maritime organizations.

Other Land-Use Planning. Section 87 of the Environment Protection and Management Law requires EPA, in consultation with the relevant ministries, to issue guidelines and prescribe measures for land-use planning at the district, county, and national level. These measures are to include the development and implementation of an integrated land-use policy based on scientific soil classification (87(1)(a)); the adoption of planning and management systems that facilitate the integration of waters, forests, mountains, and other natural resources [into the land-use plan] (87(1)(c)); the development of policies that encourage compatible, mutually reinforcing land use and management of land resources (87(1)(e)); and the reform of land tenure procedures (87(1)(f)). Section 87 also directs EPA and the relevant Line Ministry to monitor the implementation of a land-use plan prepared in accordance with the Section's requirements.

Analysis

In the wake of Liberia's civil conflict and the return of displaced persons, extensive rebuilding of infrastructure and new housing construction are occurring. Extractive industries, such as mining, are likely to vigorously resume their activities as well. These expected developments highlight the critical role of biodiversity planning, including land-use planning, in protecting biodiversity, both within and outside of protected areas.

Coordination. The biodiversity plans currently provided for under EPA's framework environmental law raise several concerns. As the current law only provides that county (local) environmental action plans shall be "in conformity with" the national plan, it is unclear where the division between the national and local plans falls, and to what extent the national plan will dictate local activities. Laying out this distinction more clearly could foster cooperation between the counties and the national government. Another issue to be addressed is the relationship between the national environmental action plan and other existing or potential plans, such as coastal zone plans, land-use plans, and protected area management plans. Because the scope of the national plan is not, on its face, limited in any way (it is to contain "all matters affecting the environment" and serve as "the basis for national environmental planning and implementation of development programs"), it is important to

coordinate this plan with other planning efforts, so as not to create any conflicts.

For instance, the Ministry of Planning and Economic Affairs has prepared an extensive National Biodiversity Strategy and Action Plan.²⁰³ The Plan includes background information (geographical context, cultural and socioeconomic data, and history and political settings), information on the status of biodiversity in Liberia and threats to this biodiversity, and a list of guiding principles and six specific goals, each broken down into a number of smaller objectives.²⁰⁴ As this Plan contains extensive information on biodiversity generated through a broad-based participatory process, cross-references to the Plan would strengthen the development of any future environmental or biodiversity plans under the current legislation. The National Forest Management Strategy established under the 2006 Forestry Law should help facilitate this coordination by linking the National Forest Policy with existing national land, economic, and development plans.

Content & Structure of Plans. Apart from the coastal zone survey specified in Section 82(4), the EPA laws provide little guidance on the sources for, and content of, the environmental action and coastal zone plans. Sources of information for developing the plans include mapped and written descriptions of land cover; an inventory and assessment of listed, rare, and commercially important plant and animal species and their habitats;²⁰⁵ mapped and written descriptions of areas that can provide long-term protection for listed species; and a description of factors contributing to the loss of biological diversity.²⁰⁶ With respect to content, the plans might include summaries and maps based on the studies conducted above; a description of national priorities in biodiversity management and conservation; maps showing the identification and location of key species; steps to take to implement the plan, including at the legislative, regulatory, project design, and land acquisition levels; and the costs and sources of funding for implementing these actions, as well as the agencies responsible for their implementation.²⁰⁷ Ideally, this information would come from the centralized data management system discussed under Section 10, *supra*.

The legislation also does not provide for development of a draft plan (including public

notice and comment, explained below), the submission of a final plan for approval, or procedures for amending the plans between their specified 3-year (coastal zone) or 5-year (environmental action) revisions. These provisions would help ensure that the plans properly address biodiversity concerns and can respond to new biodiversity issues that may arise.

*Land-Use Planning.*²⁰⁸ Land-use planning is a critical component of biodiversity planning, as land-use changes that destroy native habitat constitute a primary driver of biodiversity loss.²⁰⁹ The role of comprehensive land-use planning in conserving biodiversity in Liberia is well recognized.²¹⁰ For instance, a recent Executive Order called for the identification of appropriate areas for a new forest concession system based on land-use planning principles.²¹¹ Although EPA has not yet issued guidelines and measures for the development and implementation of a comprehensive land-use policy under Section 87, the Liberia Forest Initiative is nearing completion of the first phase of a land-use planning process, including the delineation of new protected areas and conservation zones.²¹² Integration of this process with development by EPA of a land-use planning system for municipal areas could help mitigate the impact of population expansion and land-use change on biodiversity habitat. Land tenure reform, about which a national dialogue is under way, is also an important consideration in the development of a comprehensive land-use planning system.

Public Participation. Except for the public comment requirement attached to the National Forest Management Strategy, existing planning legislation provides for no meaningful public involvement in the development and approval of biodiversity plans. Effective public participation mechanisms would include notice and opportunity to comment on a draft version of the biodiversity plans, including the holding of public workshops to educate communities and hearings to solicit comments. Efforts might also be made to link the development of county plans by the County Environmental Committees to local governing authorities, such as town councils.

Other. Remaining issues that might be considered include the need for biodiversity planning for both open spaces and developed areas, and planning

for special ecological zones outside protected areas. In this respect, legislation could be used to address the identification of potential conservation areas that may require some sort of heightened protection, even though they have not been given formal protected area status.

(12) Public Participation

Introduction. The participation of stakeholders (the general public, NGOs, and private sector representatives, among others) in environmental decision-making can help facilitate transparent and accountable governance, as well as more effective biodiversity protection. At a basic level, the public has a fundamental right to participate in decisions that affect citizen health and well-being. Public involvement in environmental decisions can also broaden the scope of relevant information about the biodiversity impacts of policies, legislation, and development activities, and provides an important mechanism for clarifying the values and trade-offs associated with various environmental decisions. When citizens and other groups feel that their voices have been heard, they are more likely to support a final decision, even if it does not reflect their preferred course of action. Such support can help facilitate enforcement in the face of limited government resources, with the public playing an important role in monitoring the implementation of environmental decisions. Insufficient public involvement, on the other hand, can contribute to resistance, increased administrative costs, and poorly designed and executed environmental decisions.

International Law. Several international agreements discuss public participation and access to information. The African Convention²¹³ directs parties under Article 8(b) to establish and implement informational campaigns capable of acquainting the public with conservation practices and methods. Similarly, Article 13 of the Convention on Biological Diversity²¹⁴ requires parties to develop educational and awareness-raising programs for the promotion of biodiversity and conservation. Article 17 of the UN Convention to Combat Desertification²¹⁵ asks signatory parties to develop and strengthen local research skills while giving particular attention to multidisciplinary and participative socioeconomic research.

Article 19 of the Convention requires parties to gain the full support of local communities, especially women and youth, in their efforts to combat desertification and mitigate the effects of drought. Under Article 23 of the Cartagena Protocol,²¹⁶ parties must promote and facilitate public awareness, education, and participation concerning the safe transfer, handling, and use of living modified organisms in relation to the conservation and sustainable use of biological diversity. Finally, Article 10 of the World Heritage Convention²¹⁷ directs signatories to invite public organizations or individuals to participate in its meetings as consultants, while Article 27 calls for the development of educational and informational programs to strengthen public understanding and appreciation for cultural and natural heritage.

Summary of Liberian Law

Access to Information. The right of Liberian citizens to obtain environmental information is established primarily under Section 101 of the 2003 Environment Protection and Management Law. This section provides access to “environmental information,” further defined as information relating to implementation of the Law, or concerning the environment and natural resources in accordance with the Law, to “any person”²¹⁸ who seeks it (101(a)). Persons seeking such information must submit an application and may pay a “minimal or reasonable” fee as set by EPA (101(2),(4)).²¹⁹ Although there is no right to access proprietary information, the keepers of such information must apply to EPA for protection from its release (101(3)(a)). The law explicitly exempts emissions data and information that would “otherwise defeat the principles and objective of this Law” from such proprietary protection (101(3)(b)). It also directs EPA to establish a Public Registry that contains all records and information generated in accordance with the law (101(5),(7)). Finally, the law exempts EPA, line ministries, and their employees from civil or criminal liability arising from the disclosure of any record (101(8)).

In addition to Section 101, Section 100(1)(d) directs EPA to disseminate information to “public and private users,” while Section 6(f) of the 2003 EPA Act authorizes EPA to allow, at minimal or no cost, access to environmental information in connection with the Act. Finally, with respect to the EIA process, Section 33 directs EPA to make all EIA documents available to the public “in a timely and

pr[e]scribed manner,” although this is not defined or set forth through regulations.

The 2006 Forestry Law also contains a comprehensive provision on public information. Section 18.15 of the law (Public Access to Information) directs FDA to facilitate free public access to “all documents and other information in its possession.” The section exempts from disclosure, with certain exceptions, nine categories of information (18.15(c)), and provides for judicial review of FDA decisions regarding disclosure (18.15(d)). The Liberia Forest Initiative has drafted a regulation (that is expected to issue imminently) fleshing out this statutory requirement in more detail.

Notice and Comment. The main notice-and-comment provisions under the 2003 Environment Protection and Management Law are contained within the section on Environmental Impact Assessment (see discussion under Section 9, supra). Although the 2003 Law envisions the development of sectoral environmental laws, it does not seem to require notice and comment with respect to this process. In addition, none of the FDA laws or regulations appear to provide for notice and comment by the public in connection with rulemakings.²²⁰

The 2006 Forestry Law also provides for public comment on certain actions by the FDA, including proposals to establish new protected areas (9.3); drafts of the National Forest Management Strategy (4.4(e)); the granting of title over forest land to private parties (8.2(b)); and proposed regulations (19.2(a)).

Access to Justice: Citizen Suits. Section 32(2) of the 2003 Environment Protection and Management Law allows citizens to bring suit to stop environmentally harmful acts; to compel ministries, agencies, and other public authorities to prevent or discontinue any environmentally harmful acts; to subject ongoing activities to environmental audits and/or monitoring; to compel environmental restoration; to provide compensation to victims of pollution, including the cost of “beneficial uses lost as a result of an act of pollution”; and to seek, by court order, other measures to prevent significant damage to the environment. In addition, Section 32(3) authorizes EPA to recommend rules allowing citizens to appeal directly to the EPA, to bring a case in the environmental courts established under the Law, or to seek environmental protection “through the judicial process.”

The 2006 Forestry Law also contains a comprehensive citizen suit provision. Section 20.10 (Citizen Suits and Civil Enforcement) provides for citizen suits (upon 60 days' notice) against private parties for any violation of the law, its regulations, or the Code of Forest Harvesting Practices (20.10(a), (d)). The section also authorizes citizen suits against the Government to compel compliance with the law, its regulations, and internal procedural manuals (20.10(c)). Successful plaintiffs may also be awarded compensation for legal expenses (18.15(f)). In addition, the Government may intervene in any suit brought against a private party for non-compliance with the law (18.15(h)).

Analysis

The 1992 Rio Declaration on Environment and Development, Principle 10, elaborates what have become recognized as the three "pillars" of public participation: 1) access to environmental information; 2) public participation in environmental decision-making; and 3) access to justice in environmental matters.²²¹ These three pillars are mutually reinforcing and have, both individually and as an integrated concept, become the basis for an increasingly rich body of international and national law. As such, they provide an important framework for the role of public participation in decisions that affect biodiversity.

Access to Information. Access to information is a necessary precursor to citizen participation in the enactment and enforcement of environmental laws. Two preliminary issues under Liberian law concern the definition of environmental information and of entities from which information may be sought. Section 101(1) of the 2003 Environment Protection and Management Law indirectly defines "environmental information" as "information relating to the implementation of this Act or any other information concerning the development and management of the environment and natural resources in accordance with this Law." This definition could be made more specific, to clarify topics that would be covered and leave less room for arbitrary denials.²²² In addition, Section 101 does not appear to limit the scope of information requests to public institutions, though it may be doubtful that private entities were meant to be included. It might be useful to clarify which agencies (presumably all government institutions) are subject to its requirements. Section 18.15 of the

2006 Forestry Law does not trigger these concerns, as it simply directs FDA to make all information in its possession available to the public.

Another issue to consider is to what extent control over the information disclosure process (at least for information outside FDA) should be vested with EPA. Currently, the law gives most of this control to the agency – it designates EPA as the recipient of requests by the public for environmental information, gives EPA authority to approve requests from agencies for exemption from information disclosure, and directs EPA to establish a Public Registry containing all records and information related to requests made under Section 101. Given the number of agencies whose work may affect the environment,²²³ and thus fall within the scope of a request made under Section 101, the Government might wish to allow agencies to develop their own regulations to implement the law, as the FDA is in the process of doing. Another option is to consider developing a single national law governing access to information across sectors. This law could be global in scope, or limited to environmental information. Either way, it could establish, in broad terms, consistent procedures and guidelines for all agencies with access to environmental information.

The requirements contained in Section 101 could be further developed by addressing how to submit requests (including what they must contain and who is responsible for receiving and processing them), the amount of any applicable fees (even if the law limits these to what is "minimal" or "reasonable," which is not defined, there is the cost of search time and photocopying to consider), and whether to exempt requests made for a "public purpose"²²⁴ (e.g., not for commercial use) from the required fee amount. In addition, it may be prudent to include a reasonable timeline (e.g., 30 days) for responses by the agency to requests submitted under Section 101. These suggestions apply equally to the 2006 Forestry Law, particularly since Section 18.15 of the Law contains no instructions for submitting information requests to FDA.

The Environment Protection and Management Law also does not fully address exemptions and denials relating to information requests. While it provides exemptions from disclosure for proprietary information and information that would "otherwise

defeat the principles and objective of this Law," this leaves a significant amount of discretion to EPA or another agency to decide what information may be withheld from disclosure. Other exemptions that might be considered include matters relating to international relations, national defense, or public security; commercial and industrial confidentiality; intellectual property rights; personal data; and information that is gathered voluntarily²²⁵ (section 18.15(a) of the Forestry Law contains examples of these and other exemptions). Procedures for denying a request for information, as well as the right to seek review of such decisions at the administrative and judicial level, are additional important components of access to information. The 2006 Forestry Law (Section 18.15(d)) does provide for judicial review of the FDA's decision to exempt information, though it does not specify procedures for denying information requests.

Access to Justice: Citizen Suits. Citizen suits can play a vital role in enforcing environmental laws and promoting government accountability. While Section 32 sets a strong precedent for allowing such suits, its application might be strengthened by a few considerations, one of which is the concept of providing notice of intent to bring suit. Section 18.15(d) of the 2006 Forestry Law contains one such notice requirement. Under a typical notice provision, citizens planning to file suit must send a written notice to the potential defendants that explains the citizens' intent to sue and the basis on which the defendants are presumed to be in violation of the law. The notice must be sent a certain amount of time prior to the actual filing of such suit, which allows potential defendants to take steps to come into compliance and theoretically avert the need to file a lawsuit. At the very least, it puts the potential defendants on notice of the alleged violation and gives them an opportunity to respond, though no response is required. The effective use of a notice provision could go a long way towards reducing the need to file litigation, while still encouraging citizens to hold violators accountable.

In addition, although the 2003 EPA Act (Section 32) sets forth a broad range of environmental actions that are subject to citizen suits, it might be desirable to incorporate a provision allowing citizens to challenge an agency's failure to act. For instance, the failure to require a discharge permit or EIS license for activities that impact

biodiversity can cause significant harm to species and ecosystems. An example of such a provision is found in Section 18.15(c) of the 2006 Forestry Law, which authorizes citizen suits to compel the Government to comply with the law.

Notice and Comment. Since the Environment Protection and Management Law is intended to spearhead the development of environmental laws and regulations across a broad range of sectors, it is crucial that citizens have the opportunity to participate in this process through notice of the proposed laws and regulations, hearings, and the opportunity to comment in writing or through live testimony. Meaningful citizen participation is likely to inform and strengthen the resulting laws and regulations. Such participation can also facilitate greater compliance by the public, thus reducing the demands on enforcement. Other areas in which notice and comment would be desirable include the permitting process and the setting of environmental standards, both of which can affect biodiversity. Although the 2006 Forestry Law does provide for notice and comment with respect to certain actions by the FDA, including the promulgation of regulations, proposal of new protected areas, and drafting of the National Forest Management Strategy, this might be extended to other actions, such as the modification of protected area boundaries under Section 9.7 and the drafting of management plans under Section 9.8.

In addition, Liberia might consider developing the mechanics of its notice-and-comment procedures in more detail. These include: when notice of a proposed action should be given; how information or notice will be disseminated (e.g., in what languages, through what media, and for what purpose); and how public comments will be considered in the decision-making process and addressed in the final decision. As the EIA framework already addresses a number of these issues,²²⁶ it would not be difficult to incorporate its approach to other environmental decisions that affect biodiversity, such as permitting and standard-setting. The Liberia Forest Initiative has already developed, via regulations that are expected to issue imminently, detailed notice-and-comment requirements for the promulgation of new regulations, codes, and manuals.

II. Institutional Capacity to Protect Biodiversity ²²⁷

The protection and management of biodiversity depends not only on strong environmental laws and regulations, supported by robust scientific information, but also on their effective implementation and enforcement on the ground.²²⁸ In the wake of Liberia's 15-year civil conflict, the challenges confronting its government institutions are vast – including infrastructural, administrative, and staffing needs.²²⁹ Despite such obstacles, these institutions are pressing ahead with their mandated activities, many of which involve the conservation and sustainable management of biodiversity. Their efforts are complemented by a number of domestic and international NGOs and international financial organizations working in-country.

This Section provides a snapshot of Liberia's institutional capacity with respect to biodiversity conservation and management. It introduces the primary government ministries and related organizations whose mandates address or touch on biodiversity concerns, as well as the relevant domestic and international NGOs. Following is an examination of issues confronting Liberia's government institutions in the areas of infrastructure and administration, human resources, information and data collection, enforcement, institutional collaboration, and financial support. The Section closes with more detailed profiles of four key agencies (the Forestry Development Authority, Ministry of Agriculture, Ministry of Lands, Mines, and Energy, and Ministry of Planning and Economic Affairs), based on information gathered through personal interviews conducted by Liberian attorney and ELI Visiting Scholar Paul Jarvan.

A. Liberian Government Entities ²³⁰

Liberia has a number of government agencies, ministries, and bureaus, along with municipal and state industry entities, whose mandates encompass biodiversity issues in some fashion. To the extent they do exist, these entities' biodiversity-related mandates and activities overlap in certain respects and in some cases appear to conflict with one another. The key institutions are briefly described below.

Agencies

Forestry Development Authority

Created in 1976, the Forestry Development Authority (FDA) is responsible for sustainably managing Liberia's forests and related resources. The agency provides forestry planning, develops forestry policy, administers and enforces the forestry laws, administers concession agreements, calculates forestry fees, carries out reforestation and forest research and training, monitors the activities of timber companies, and sets up and administers national parks. It is also charged with implementing the 2006 Forestry Law and associated regulations. The FDA's specific statutory authorities under the 1976 Act Creating the FDA and the 2006 Forestry Law are discussed under Part I of this Analysis.

Environmental Protection Agency

Formerly the National Environmental Commission of Liberia, the Environmental Protection Agency (EPA) came into existence in 2003. It is charged with implementing the Environment Protection and Management Law, a framework environmental law that envisions the development and harmonization of sector-specific laws.²³¹ EPA serves as the principal authority for managing environmental quality, and it is directed to coordinate all activities relating to environmental protection and the sustainable use of natural resources. It also promotes environmental awareness and oversees the implementation of international conventions related to the environment.

Ministries

Ministry of Agriculture

The Ministry of Agriculture plans, administers, and supervises agricultural programs and provides extension services. It also trains local farmers in improved agricultural practices and provides farm inputs to increase food security.

Ministry of Lands, Mines, and Energy

The Ministry of Lands, Mines, and Energy is responsible for developing Liberia's mineral, water, and energy resources; administering its lands; regulating mining activities; and cooperating with the Ministry of Agriculture and University of Liberia on land rehabilitation.

Ministry of Planning and Economic Affairs

The Ministry of Planning and Economic Affairs serves as a direct link among Liberian government institutions, private and non-profit organizations, and international organizations. It is also responsible for providing guidance to government institutions in preparing development programs and projects; reviewing proposals for new development programs and projects; and reviewing progress made on development programs and projects.

Ministry of Internal Affairs

The Ministry of Internal Affairs administers the affairs of all government functionaries in Liberia, oversees the activities of all local bodies, such as chiefdoms and clans, and supervises all County Superintendents.

Ministry of Health and Social Welfare

The Ministry of Health and Social Welfare coordinates and administers all general health services in Liberia, including preventive services; collects health statistics; ensures drug availability; and monitors events and conditions affecting public health. It also maintains statistics from birth and death registrations.

Other relevant ministries include the Ministry of Transport, Ministry of Commerce and Industry, Ministry of Public Works, Ministry of Foreign Affairs, and Ministry of Rural Development.

Bureaus

National Bureau of Fisheries

The National Bureau of Fisheries is charged with conserving all fish resources and aquatic environments in Liberia.

Bureau of Maritime Affairs

The Bureau of Maritime Affairs oversees Liberia's maritime program, particularly its shipping registry.

Corporations, companies, and boards

Liberia Water and Sewer Corporation

The Liberia Water and Sewer Corporation oversees the generation and distribution of water to the public. It is responsible for maintaining a supply of safe drinking water and providing for waste disposal and the maintenance of sewage facilities.

Monrovia City Corporation

The Monrovia City Corporation was created in 1973. Among other things, it enforces city ordinances, manages municipal waste, and provides additional services in environmental health and sanitation, as well as recreation.

Liberia Electricity Corporation

The Liberia Electricity Corporation was created in 1973 to generate, transmit, distribute, and sell electricity throughout the country at reasonable rates. In July 2006, electricity was restored to parts of Monrovia for the first time in fifteen years.

Liberia Petroleum Refining Corporation

The Liberia Petroleum Refining Corporation oversees Liberia's petroleum production.

Other relevant entities include the Liberia Mining Company and the National Water Resources and Sanitation Board.

B. National & International Organizations

A number of nongovernmental environmental organizations, both domestic and international, are active in Liberia. These groups include the following.

Domestic Organizations ²³²

Alliance for Conservation in Liberia (ACL). ACL was formed in January 2004 to engage local NGOs in a coordinated effort for nature conservation. It has facilitated partnerships with several international NGOs, including Conservation International, World Wildlife Fund, and Fauna and Flora International, as well as with local NGOs such as the Society for the Conservation of Nature in Liberia (below).

Society for the Conservation of Nature in Liberia (SCNL). Founded in 1986, SCNL is the oldest environmental NGO in Liberia. Its conservation projects include the creation and maintenance of protected areas, wildlife conservation, bio-monitoring, and the use of socioeconomic surveys. With support from Forest Partners International and the Philadelphia Zoo, SCNL carried out a project on bushmeat and species conservation from 2002-2004 that included a planning workshop, a media campaign, and a post-campaign survey of public

opinion. Alexander Peal, the founder of SCNL, won the Goldman Environmental Prize in 2000 for his efforts to conserve Liberia's forests and wildlife.

Save My Future Foundation (SAMFU). SAMFU advocates for community-based sustainable development in Liberia, using participatory rural appraisals to involve local people. It also collects and disseminates information on multinational companies working in extractive industries in Liberia.

Sustainable Development Institute (SDI).²³³ Formerly part of SAMFU, SDI monitors and disseminates information on natural resource management in Liberia, especially natural resource extraction, revenue collection, and appropriation. The organization targets policymakers and works with other NGOs and local communities to build alliances and seek policy reforms in various natural resource sectors. Silas Siakor, Director of SDI, was awarded the Goldman Environmental Prize in 2006 for collecting evidence of illegal logging practices that led to the imposition of UN sanctions in 2003.

Association of Environmental Lawyers (Green Advocates).²³⁴ Founded in 2001, Green Advocates is Liberia's first and only public interest environmental law organization. It is dedicated to protecting the environment, advancing human rights protection and advocacy through sound environmental policies, and giving voice to rural, indigenous, and tribal peoples who have been denied the benefits of natural resource extraction from their tribal and ancestral lands. Green Advocates works to build strong environmental laws, enforce existing laws, and empower citizens to participate in environmental decision-making.

Pollution Control Association of Liberia (POCAL). POCAL advocates for waste management and disposal, organizes nature clubs in schools, has established a botanic garden, and supports community drama clubs.

Farmers Associated to Conserve the Environment (FACE). FACE seeks to foster sustainable and environmentally friendly farming practices that at the same time yield sufficient income for local farmers. It is working on seed rice multiplication and mangrove conservation.

Environmental Relief and Development Research Organization (ERADRO). ERADRO promotes rural extension services to address health problems linked to environmental factors. Its activities include environmental research, community organization, public education on health and hygiene, and waste disposal programs in schools and communities.

Enviro-Link, Liberia LTD. Enviro-link connects individuals and communities to the environment through advocacy, awareness, education, training, and research. It also participates in environmental impact assessment in cooperation with EPA and other government institutions.

Society Against Environmental Degradation (SAED). SAED promotes environmental awareness, education, and action through projects focusing on wetlands and water management, alternative energy sources, and the use of environmental impact assessment in decision-making for sustainable development.

Liberian Community Development Foundation (LCDF). The LCDF implements grassroots community development projects to alleviate poverty and improve citizens' quality of life. Its projects include basic business management training programs, micro-credit programs, agriculture projects, improved health and sanitation in local communities, and education for the disadvantaged and underprivileged.

Center for Environmental Education and Protection (CEEP). CEEP promotes environmental education, public awareness, and sustainable development through environmental workshops and seminars in schools and communities. It also conducts youth-oriented programs in health education, as well as environmental consultation.

Liberia Indigenous Forum for the Environment (LIFE). LIFE works to build environmental awareness, empowerment, and benefit-sharing in local communities. It advocates for the preservation and use of traditional knowledge in biodiversity conservation, with a particular focus on medicinal plants and timber species.

Grand Gedeh Community Servant Association (GECOMSA). Based in southeastern Liberia, GECOMSA

focuses on community-based sustainable wildlife management initiatives, including environmental education and public awareness campaigns about bushmeat consumption.

Society of Liberian Foresters (SOLF). SOLF seeks to raise public awareness about the economic, environmental, aesthetic, cultural, and recreational values of Liberia's forest resources through education and research; promote the sustainable use of forest resources; provide consultation services to private forest owners and concessionaires; and collaborate with other organizations to improve forest conservation.

Action for Greater Harvest (AGRHA). AGRHA works to ensure sustainable food security for rural Liberian households.

Union of Rural Farmers Association (URFA). URFA works with local farmers on community agriculture and rural development programs that focus on household food security.

Concerned Environmentalists for the Enhancement of Biodiversity (CEEBS).

International Organizations

Fauna & Flora International (FFI).²³⁵ An active international NGO in Liberia, FFI seeks to conserve threatened species and ecosystems worldwide, choosing solutions that are sustainable, based on sound science and that take account of human needs. In Liberia, FFI has served as a partner in the Liberia Forest Reassessment ("LFR") Project,²³⁶ worked to strengthen the management of Sapo National Park, built the capacity of a number of local organizations, helped to develop environmental legislation, and assisted the LFR in developing a Geographic Information Systems laboratory (GIS) for improved forest management analysis and planning.

Conservation International (CI).²³⁷ CI applies innovations in science, economics, policy, and community participation to protect plant and animal diversity around the world. CI is working with the Government of Liberia to set up a network of protected areas and, through its Center for Applied Biodiversity Science, has worked with FFI to co-implement the Liberia Forest Reassessment Project.

Environmental Foundation for Africa (EFA).²³⁸ From July-December 2004, EFA worked with UNHCR partners to conduct rapid environmental assessments in returning refugee areas, and to help returning refugees acquire practical skills in agro-forestry, domestic energy conservation and land reclamation, as part of several post-conflict community development initiatives.

Partnerships

Liberia Forest Initiative (LFI).²³⁹ Launched in 2004, the Liberia Forest Initiative is a partnership of government, international, and non-governmental organizations working together to support the rehabilitation and reform of Liberia's forestry sector and to promote sustainable forest management. It provides support around three main themes: commercial forestry, community forestry, and conservation. The LFI also works on such cross-cutting issues as governance and the rule of law; transparency and information management; policy development; legislation; capacity building; and security.

C. Institutional Capacity-Building

Despite enormous setbacks occasioned by Liberia's long-running civil conflict, its government institutions can claim a number of key accomplishments with respect to biodiversity conservation. These include the establishment and maintenance of Sapo National Park and East Nimba Nature Reserve, preparation of the National Biodiversity Strategy and Action Plan for Liberia, completion of an inventory on persistent organic pollutants, implementation of a project on the impact of climate variability on biodiversity, and a degree of successful enforcement of wildlife and forest conservation laws. Moreover, these institutions have retained much of their structure and personnel throughout years of turmoil.

At the same time, the activities of Liberia's government institutions are constrained by a number of factors, as recognized in the National Biodiversity Strategy and Action Plan. These factors include: (1) inadequately trained personnel and misplacement of available personnel; (2) lack of basic facilities and

infrastructure; (3) low levels of public participation; (4) poverty; (5) inadequate public education; (6) insufficient political will; (7) inadequate policy and legislation; and (8) lack of coordination and cohesion.²⁴⁰ As a result, many unmet needs exist in the areas of infrastructure and administration, human resources, information and data collection, finances, and enforcement. Although addressing these needs will require considerable additional resources, it is essential to enable Liberia's government institutions to fully carry out their functions with respect to biodiversity protection.

The importance of building capacity at the institutional level is even greater in light of the extensive assistance being rendered to Liberian government institutions by international organizations. Currently, there are a number of international organizations operating in Liberia, several of which play significant roles in the country's development. These groups often belong to major international networks that afford them access to resources and expertise far greater than those available to Liberia's government institutions. While the assistance provided by these organizations has been invaluable, there is some risk that dependence on foreign expertise and resources, absent substantial investment in local capacity, may breed some resentment. For instance, local scientists and conservation professionals could become frustrated in the face of a lack of facilities, a lack of recognition at home and abroad, and a lack of opportunity.²⁴¹ In addition, government institutions may have little capacity to act outside areas of interest to their international partners.

Particular issues with respect to the capacity of Liberia's government institutions to protect biodiversity include the following:

Infrastructure and Administration. Liberia's long-running civil war decimated much of the country's infrastructure, including government facilities, and severely disrupted many government functions. In the aftermath of the conflict, the country's ministries face severe shortages with respect to office space, equipment, and supplies. Interviews with representatives from four different Ministries all point to a shortage of office space.²⁴² For instance, a Forestry Development Authority (FDA) representative noted that two Divisions must share

office space, including a single computer with an outdated printer.²⁴³ Many Ministry offices lack computers, photocopiers, and fax machines. The Environmental Division of the Ministry of Planning and Economic Affairs possesses no office equipment;²⁴⁴ the Ministry of Agriculture's National Quarantine and Environmental Service Department of Technical Services lacks computers, photocopying machines, and faxes;²⁴⁵ and the Hydro Meteorological Section of the Ministry of Lands, Mines, and Energy lacks computers, fax machines, and monitoring equipment.²⁴⁶ Several government representatives also highlighted the need for transportation to facilitate field visits.²⁴⁷ In sum, the lack of logistical support was universally cited by interviewees as one of the biggest impediments to the effective functioning of government institutions.

Human Resources. Another area requiring attention at the institutional level is staff availability and development. Staffing needs stretch across many agencies – the FDA cites a need for extension officers, as well as planning and mobilization officers, in each of the agency's five regions;²⁴⁸ the Ministry of Planning and Economic Affairs needs additional staff for its Environmental Planning Division;²⁴⁹ the Ministry of Lands, Mines, and Energy needs staff for the Hydro Meteorological Section's Geographic Information System and remote sensing projects, in addition to a climatologist;²⁵⁰ and the Ministry of Agriculture requires staff at its border posts and various sub-stations.²⁵¹

Additional staff training is highly desirable.²⁵² Liberia currently possesses little institutionalized expert capacity in biodiversity management and the fundamental science to support it, including taxonomy, land-use planning, and GIS. Several officials at FDA and the Ministry of Agriculture have emphasized the need for staff training to improve their agencies' operations.²⁵³ Staff training is also considered a budget priority by the Ministry of Planning and Economic Affairs.²⁵⁴

FAO's Wildlife Conservation Issue Paper²⁵⁵ makes several recommendations for developing wildlife training and skills for FDA staff in particular. These include establishing a partnership with the University of Liberia's College of Agriculture and Forestry, to assist university graduates in obtaining PhDs in wildlife management abroad so that

they can help set up a Department of Wildlife Management at the university upon their return, as well as the sending of trainees to wildlife schools in Tanzania (College of African Wildlife Management) or Cameroon (Wildlife School) to teach them more about wildlife management in preparation for working in Liberian protected areas.²⁵⁶ Another option is to bring instructors from these schools to Liberia to teach classes in law enforcement, wildlife legislation, and anti-poaching.²⁵⁷ While Liberia has the basic capacity to provide vocational and higher-education-level training in agriculture and forest management, there is an urgent need for university-level training in conservation biology, conservation management, and land-use planning.

In addition to conservation, agriculture, and forest training, additional courses for agency staff on such topics as social survey skills could help build stronger community-based forestry and natural resource management systems. For instance, relevant courses could examine the potential of social surveys to improve policies regarding community resource use; the art of survey design and planning; how to conduct data analysis; and how to effectively communicate survey findings to policymakers and decision-makers. Staff could also learn how to develop strategies for communicating and discussing relevant policy issues and survey findings. Such strategies include public talks and panel discussions in towns and cities, media articles and radio panel discussions, and seminars and briefings for policymakers and advocates.

Information and Data Collection. Liberian government institutions are also facing shortages of scientific information pertaining to biodiversity. The Ministry of Agriculture's National Quarantine and Environmental Service Department of Technical Services possesses field identification guides, monographs, and survey data, but lacks information on zoological collection as well as computerized databases.²⁵⁸ While FDA's Division of Wildlife, National Parks, and Recreation does have some computerized databases (along with field identification guides and some survey data), the Division lacks access to comprehensive data on species abundance and distribution.²⁵⁹ FDA's Technical Manager for Conservation also points to the need for a survey to update the agency's information on endangered and

protected species in Liberia.²⁶⁰ Although Liberia can provide vocational and higher-education training in agriculture and forest management, more extensive training in conservation biology, conservation, taxonomy, and land-use planning would also help to address deficiencies in biodiversity information.

Enforcement. Liberia's civil conflict, and the resulting shortages in staffing, supplies, and equipment described above, have given rise to extensive problems in the enforcement of laws relating to biodiversity protection. Interviews with agency representatives – particularly at FDA, the agency primarily responsible for enforcing the protected area and wildlife laws – indicate, for example, that enforcement in Sapo National Park is severely hampered. For instance, one FDA official noted that as a result of the war, Sapo lacks logistical support, capacity to fully protect its boundaries, and funds to carry out other activities.²⁶¹ The lack of proper equipment for park rangers also impedes biodiversity-related law enforcement.²⁶²

The Dahn Report²⁶³ further describes how logistical problems caused by the war have rendered monitoring and enforcement by FDA with respect to logging and illegal hunting virtually nonexistent, both inside and outside Sapo National Park. For instance, the report notes that as of 2002, FDA lacked residential and office facilities in all of its regions except Grand Bassa County. The District Foresters in Grand Gedeh, River Gbeh, and Maryland counties lack residences and transportation, forcing them to depend on logging companies operating in the area for communication. In Sinoe County (Region 3), the Regional Forester and staff use buildings belonging to the Vamply logging company as offices and residences. The report also notes that Sapo National Park contains no head office, one privately-owned vehicle, and no uniforms for staff, rendering the park vulnerable to encroachment and illegal hunting. Other reports also emphasize FDA's equipment and infrastructure needs.²⁶⁴ Until these needs are met, the FDA will likely find it difficult to enforce fully the laws and regulations governing biodiversity.

Biodiversity laws are enforced not only by the agencies, but also through the courts. Although

the 2003 EPA Act provides for the establishment of an Environmental Administrative Court and Environmental Court of Appeals (Sections 33-34), these courts have not yet been created. At least some infractions are currently handled through existing courts, though it is unclear how effectively they are resolved.²⁶⁵ Establishment of the environmental courts envisioned in the 2003 EPA Act may greatly enhance the ability of government agencies to enforce biodiversity laws and regulations, by providing for a specialized venue with substantive expertise.

Institutional Collaboration. Another important aspect of institutional capacity involves collaboration on biodiversity issues among government institutions, NGOs, and quasi-government bodies (e.g., the World Bank). Such collaboration helps to resolve problems resulting from sectoral conflicts and overlapping jurisdiction.²⁶⁶ It may be particularly important for Liberian government agencies to coordinate their actions with respect to activities such as mining, farming, and logging, all of which pose threats to biodiversity.²⁶⁷ Currently, a number of government institutions collaborate on a formal and informal basis with other groups. The Ministry of Agriculture monitors the movement of flora and fauna, as well as the use of chemicals, in partnership with a wide range of ministries and the Monrovia City Corporation.²⁶⁸ FDA receives assistance for park patrols from Flora and Fauna International (FFI) and Conservation International (CI),²⁶⁹ and has collected data in protected areas in collaboration with CI and the Society for the Conservation of Nature in Liberia (SCNL).²⁷⁰ The Ministry of Planning and Economic Affairs serves as Chair of EPA's Board of Directors and collaborates with UNDP, UNEP, and some local NGOs,²⁷¹ while the Ministry of Lands, Mines, and Energy also works in partnership with international organizations.²⁷²

Despite progress, some complications exist with respect to cooperation among government institutions and between government and NGOs. For instance, although the Ministry of Planning issues certificates of accreditation to qualifying NGOs, officials note that NGOs fail to cooperate with the Ministry after they receive their accreditation.²⁷³ According to an FDA official, despite the fact that FDA works with environment and development NGOs, the agency has not been given access to these groups' recommendations.²⁷⁴ The same official

notes that a lack of coordination and overlapping functions have hampered FDA's efforts to promote biodiversity protection. Such concerns are not limited to NGOs. An official with the Ministry of Agriculture pointed to significant interference with the Ministry's independence by other line ministries.²⁷⁵ More broadly, jurisdictional conflicts have been observed with respect to land tenure and land use,²⁷⁶ water management,²⁷⁷ and protected species.²⁷⁸ In light of such problems, it may be helpful to convene agencies and NGOs at a conference to discuss how to coordinate their activities. It might also be useful for agencies to establish an ongoing consultation process for the development and enactment of regulations governing areas of overlapping mandates.²⁷⁹ This would ensure that agencies do not unintentionally usurp one another's roles, even when their activities target the same sectors.

Financial Support. Virtually all agency representatives interviewed pointed to financial constraints as a key obstacle to agency operations. The Acting Head of FDA's division of Wildlife, National Parks and Recreation identified the lack of financial resources as the biggest cause of the institution's inability to protect biodiversity.²⁸⁰ A lack of financial support was also cited directly by a representative from the Ministry of Agriculture.²⁸¹ Budget priorities include salaries, maintenance of the office generator, and the purchase of stationery at FDA;²⁸² salaries, logistics, and assessment at the Ministry of Agriculture;²⁸³ and staff training and project implementation at the Ministry of Planning and Economic Affairs.²⁸⁴ Government institutions currently receive their funding from a range of sources, including the Government of Liberia itself, international organizations²⁸⁵ such as UNICEF, the European Union, and certification fees from local NGOs. Revenue for some forest management activities is also generated through the imposition of stumpage, land rental, and Forest Product fees (Section 14.2(b)), a portion of which is allocated for operational costs of the Protected Forest Areas Network.

An increase in funding and in-kind support would strengthen the capacity of Liberian government agencies to implement their mandates with respect to biodiversity protection. A transparent accounting mechanism is also important for managing such funds. In the forest arena, current discussions center around a forest conservation tax and trust fund.²⁸⁶ In addition, the 2003 EPA Act

proposes to establish two types of funds: a National Environmental Fund, composed of state budget allocations, fees, contributions and donations, fines and compensations required by court rulings or agreements, research returns, payment for services, and permit fees (Section 45); and a Trust Fund, composed of a portion of fees and fines; refundable performance bond deposits for environmental reclamation, rehabilitation, and restoration; and any contributions for environmental restoration (Section 50). The National Environmental Fund would be used for “the protection, enhancement and management of the environment and natural resources in Liberia” (Section 46). The establishment and operation of these funds would contribute significantly to the ability of government organizations to carry out their duties.

D. Institutional Profiles ²⁸⁷

(1) Forestry Development Authority

Background/history. The FDA was established in 1976 to develop a forestry program that includes scientific and conservation research, productive use of publicly-owned forest lands, sustainable harvesting of forest products, and forestry training and technical assistance, while simultaneously conserving recreational and wildlife activities.²⁸⁸

*Structure.*²⁸⁹ The FDA has three primary departments, each supported by several divisions, that reflect the “three pillars” strategy in the National Forest Policy. They are:

(1) Commercial Forestry Department

- a. Chain of Custody Division
- b. National Authorizing Officer Division
- c. Environmental Protection Division
- d. Forest Protection Division

(These divisions function at the regional levels, under the direction of a regional forester.)

(2) Conservation Forestry Department

- a. Wildlife Management Division
- b. Protected Areas Management Division
- c. National Parks and Recreation Division

(These divisions are set up at each protected area when it is declared into law.)

(3) Community Forestry Department

- a. Community Forestry Planning Division
- b. Community Mobilization Division
- c. Community Forestry Extension Division

Mandate. The mandate of the FDA is to manage Liberia’s forests and associated resources on a sustainable basis while conserving Liberia’s biodiversity.

Activities to implement mandate. The FDA’s activities include setting up a protected areas network; training, employing, and equipping staff to deploy in protected areas, such as Sapo National Park and the East Nimba Nature Reserve; conducting monitoring patrols; and prosecuting violators. It also promulgates regulations, conducts inspections, and levies fines for such violations as over-harvesting of timber. The amount of enforcement taking place is debatable, however. Some interviewees state that because the FDA is still reviewing its wildlife and forestry laws, it has been unable to effectively enforce these laws over the past few years. The civil conflict has also been cited as causing a breakdown in enforcement.

Other FDA activities include forest conservation, educational awareness, agroforestry programs, environmental awareness-raising in communities surrounding protected areas, and discussion of trans-border issues (such as hunting in restricted areas, which tend to extend into neighboring countries). The FDA also works with communities in protected areas or national forest buffer zones, or that own tribal forest, for the purpose of teaching sustainable forest management.

Staffing. FDA’s Community Forestry Department has 16 staff members. The top three positions and their qualifications are: (1) Head of Planning - conducts initial planning of agroforestry community awareness and empowerment; possesses B.SC. in Forestry; (2) Head of Community Forest Management Extension Services - implements agro-forestry activities such as production of vegetables, production of farmed rice, and pig breeding; possesses B.SC. degree in General Agriculture; (3) Head of Community Mobilization & Empowerment - mobilizes community dwellers to engage in self-help and macro-credit projects. Additional staff members, such as extension officers, planning, and mobilization officers, are

needed in each of the FDA's five regions. The need for more trained staff has also been expressed.

Sapo National Park currently has 43 staff, including a Chief Park Warden (who serves as the park's principal administrator), and three Zonal Wardens, each of whom supervises park activities in his or her respective zone. The park rangers and wardens are together responsible for law enforcement in the park.

Administrative needs. FDA interviewees indicate that their office space is inadequate (two divisions share an office along with other staff); they rely on a central generator unit that supplies the entire institution; and some divisions contain only one computer, an outdated printer, and no photocopying machine, fax, or vehicles. Offices also lack tables and chairs, with a small amount of existing furniture in poor shape.

Administrative needs in Sapo National Park include additional logistical help, more trained staff, more food, and consistent payment of salaries. Greater capacity is also needed to ensure that park boundaries are demarcated and respected.

Biodiversity information. Wildlife, national parks, and recreation staff have access to field identification guides, some survey data (such as socioeconomic survey and biological surveys), and some computerized databases. Data such as information on fauna and flora populations in Sapo National Park is collected monthly and filed by field officers. Data was first collected in collaboration with the Society for the Conservation of Nature (SCNL) and Fauna and Flora International (FFI) for the purpose of considering the extension of Sapo National Park. This year, data was collected in several protected areas, including Northwest Liberia, Kpelle Forest, Gola Forest, and Grebo forest, in partnership with Conservation International. In 2003, data was collected on wood consumption and harvesting and bush meat hunting. Data collection is always done in collaboration with local communities.

Collaboration with other institutions. FDA works with both environmental and development NGOs, though it has not been given access to their recommendations. In Sapo National Park, FDA undertakes its conservation activities in partnership with NGOs and international

organizations. For instance, food for park patrols is provided by Fauna and Flora International, while logistical assistance is provided by Conservation International. Obstacles to greater collaboration and biodiversity protection include a lack of coordination and overlapping functions.

Achievements. Some of FDA's notable achievements include the establishment of Sapo National Park, maintenance of the park following the civil conflict, the removal of illicit miners from the park, and the establishment of the East Nimba Nature Reserve.

Challenges. The primary challenge confronting FDA is a lack of funding. Other challenges are widespread illicit commercial hunting, the absence of needed logistics, and the need for more trained staff. Access to better data on species abundance and distribution, improved transportation to facilitate field visits, and greater collaboration with other institutions would also be helpful. The priority issues according to one staff member include surveys to update information on endangered and protected species, development of a wildlife legislative plan, and additional training and capacity-building.

Another challenge involves the Convention on International Trade in Endangered Species (CITES).²⁹⁰ Liberia is subject to a temporary trade ban in wildlife species under CITES, imposed after the civil conflict caused a breakdown in compliance. The ban has prevented member countries from recognizing Liberia's wildlife export permits and has hindered legitimate wildlife trade. To have the ban lifted, Liberia must prepare a legislative plan with respect to endangered and protected species. The country needs technical assistance to develop such a plan.

(2) Ministry of Agriculture, Department of Technical Services, National Quarantine and Environmental Service

Background/history. The Ministry was established in 1910, with the Department of Technical Services having formed in 1948. The Department works in food security, crops and animal production, and agrochemical sectors, as well as international trade in these commodities.

Mandate. To protect or prevent the introduction of insect pests and animal diseases and monitor activities with an ecological impact, including in the areas of agriculture, land use and human settlement, site selection, domestic energy use, use of fuel wood, deforestation, and sustainable ecological livelihoods.

Activities to implement mandate. The Ministry conducts inspections and enforces rules and regulations governing the agriculture sector, particularly the quality and use of agrochemicals. The Ministry also implements agricultural programs, protects farmers' interests, encourages investment in the agricultural sector, and monitors overall activities including the movement of agricultural commodities into and out of the country. It focuses on transboundary commodity movements that are intended for the consuming public, or use on farms, large plantations and the agribusiness sector in Liberia in collaboration with neighboring countries such as Sierra Leone, Guinea, Ivory Coast and other countries in the region.

Staffing. The Department currently has 30 staff, with degrees ranging from high school graduate to post-graduate. More staff are needed, particularly at the border posts where prohibited species can be confiscated under phytosanitary and zoosanitary (plant and animal certification) standards, as well as at the various sub-stations. Improved staff training is also needed.

Administrative needs. The office has no computer or photocopying machine, no fax, and no vehicles. Transportation is needed to facilitate field visits.

Biodiversity information. The Department of Technical Services has access to field identification guides, monographs, and survey data, but no zoological collections or computerized databases. Information, which is publicly available, is stored in paper files. Field data was last collected in 2000. The Ministry needs access to better data on species abundance and distribution through the completion of more biodiversity studies.

Collaboration with other institutions. The Ministry undertakes monitoring activities in cooperation with EPA, Ministry of Health, Ministry of Lands, Mines, and Energy, Ministry of Planning and Economic Affairs, Ministry of Internal Affairs, and Monrovia

City Corporation. The Ministry collaborates with EPA on environmental protection issues that directly relate to agriculture and the use of agrochemicals and agricultural products against insects and other agricultural diseases.

Achievements. One major achievement involves species protection and the monitoring of wildlife hunting. Another is the prevention of illegal pit mining, which pollutes the main source of fresh water. The Ministry also regulates the harvesting of botanical species by herbalists and other farmers as a part of shifting cultivation practices.

(3) Ministry of Lands, Mines and Energy, Division of Liberian Hydrological Services

Background/history. The Ministry was established in 1972 to develop Liberia's mineral, water, and energy resources and administer its lands. Liberian Hydrological Services was formerly housed at the Ministry of Public Works.

Mandate. The Ministry is to serve as a research organization in water management, environmental management and air quality.

Activities to implement mandate. The Ministry is charged with conducting hydrometric measurements and publishing hydrological data for Liberia (i.e., the flow and concentration of water within a given area and how it affects species within that area). It also provides studies and implements programs involving land use, water conservation, and reclamation. In addition, it enforces mining and mining concession laws.

The Ministry also chairs the intergovernmental panel on climate change and conducts regular workshops to create awareness about various environmental issues, such as land use, water supply, soil content, and forestry.

Staffing. The Division has three staffers, all highly educated. One person possesses a B.Sc. in Civil Engineering with post-graduate studies in hydrology and climatology; another possesses a B.Sc. in Mathematics with post-graduate studies in climatology; and the third possesses a BA in Geography and is pursuing a graduate degree

in Regional Planning at the University of Liberia. Additional staff are needed to work on the Geographic Information System program and remote sensing. A climatologist is also needed.

Administrative needs. The office space is considered to be inadequate. There are no computers (though some staff have their own laptops), no vehicles, and no fax machines.

Biodiversity information. The Ministry has access to field identification guides and survey data, and is able to process and interpret biodiversity data such as data on soil quality, water quality, and soil samples and analysis. Data was last collected in 1989. It is stored in paper files and electronically.

Collaboration with other institutions. The Ministry collaborates with EPA on water quality.

Achievements. Implementation of a project examining climate variability and the impact of climate change on biodiversity.

(4) Ministry of Planning and Economic Affairs

Background/history. The Ministry was formerly part of the Ministry of Agriculture's Department of Statistics. It became a Ministry in 1961. The Ministry is the formal link between implementing ministries and the international community, and will become one of the major holders of national environmental data.²⁹¹

Divisions. (1) Economics and Planning; (2) Regional & Sectoral Planning; (3) Public Affairs; (4) Finance; and (5) Division of Environmental Planning (the main division involved in biodiversity work).

Mandate. To assist all institutions involved with the protection of biodiversity.

Activities to implement mandate. The Ministry helps ensure that all national policies and guidelines concerning natural resources and biodiversity remain within national boundaries. It also certifies all qualifying NGOs, serves as principal stakeholder to the Convention on Biological Diversity, and helps collect and analyze biodiversity data, especially that collected by EPA.

Staffing. There are 180 staff within the Ministry and two staff in the Environmental Planning Division. Staff qualifications range from high school diplomas to PhD's with more than ten years of working experience.

Administrative needs. Additional staff, vehicles, and office equipment is needed (there is only a generator for the Minister's office). In addition, the office space is inadequate.

Biodiversity-related information. Biodiversity data was last collected from 2001-2005. The data is stored in files and folders.

Collaboration with other institutions. The Ministry serves as Chair of the Board of Directors for EPA and as Principal Stakeholder on Conventions. It also collaborates with international organizations such as UNDP and UNEP.

Achievements. The Ministry prepared the National Biodiversity Strategy and Action Plan for Liberia. It has also conducted an inventory on persistent organic pollutants.

Recommendations

This Assessment has presented numerous recommendations on a range of legal, scientific, and institutional issues regarding the protection and management of biodiversity. Following are the key recommendations that Liberians may wish to consider as reform in forestry and other sectors moves forward:

- **Enact Regulations to Establish the Protected Forest Areas Network under the 2006 Forestry Law.** The Protected Forest Areas Network, mandated to encompass at least 30% of Liberia's existing forest area, has the potential to preserve a vast amount of the country's forest ecosystem. However, no regulations have been proposed or passed to govern the creation and management of this Network. Regulations are urgently needed to launch the Network and implement the protections provided for under the 2006 Forestry Law.
- **Enact Regulations to Implement Central Aspects of the 2003 Environment Protection and Management Law.** While this law contains many significant provisions that could be used to protect biodiversity, its lack of implementing regulations means that these provisions remain largely inoperative. Developing such regulations would go a long way towards increasing the Law's effectiveness. Particular areas to address include procedures for conducting Environmental Impact Assessment, the establishment of protected areas (including non-forest ecosystems), and implementation of the provisions governing public participation and access to information.
- **Pass a Comprehensive Wildlife Law.** The 2006 Forestry Law calls for the drafting of a new comprehensive wildlife law by October 2007. Such a law represents an important opportunity to consolidate the species protection provisions contained in the 2006 Forestry Law with those found in the 2003 Environment Protection and Management Law. Specific areas that the new law could address include the definition of threatened and endangered species, provisions to list species in need of protection, prohibitions on the taking of species, and the regulation of trade in wildlife in conformity with CITES requirements.
- **Move Toward Community-Based Natural Resource Management.** Meeting the needs of communities that depend on biodiversity resources is crucial to the successful conservation and sustainable use of these resources. Although the 2006 Forestry Law directs FDA to grant forest user and management rights to local communities and to provide alternative livelihoods to communities harmed by the establishment of protected areas, regulations are needed to implement these important provisions. The Forestry Law's call for a comprehensive law governing community rights with respect to forest lands represents an important opportunity to further promote community-based natural resource management in Liberia.
- **Build Institutional Capacity to Enforce Biodiversity Laws and Regulations.** The existence of comprehensive legal provisions to protect biodiversity means little without a corresponding ability to implement and enforce these provisions. Given Liberia's considerable post-conflict and reconstruction challenges, building the capacity of key government agencies (such as the FDA and EPA) is critical to carrying out legal mandates to protect biodiversity. Particular areas to target include staff training in conservation, forestry, and agriculture; tools for information and data collection; basic infrastructure and equipment support; and improved collaboration among and between government agencies and other institutions working to protect biodiversity in Liberia.

Conclusions

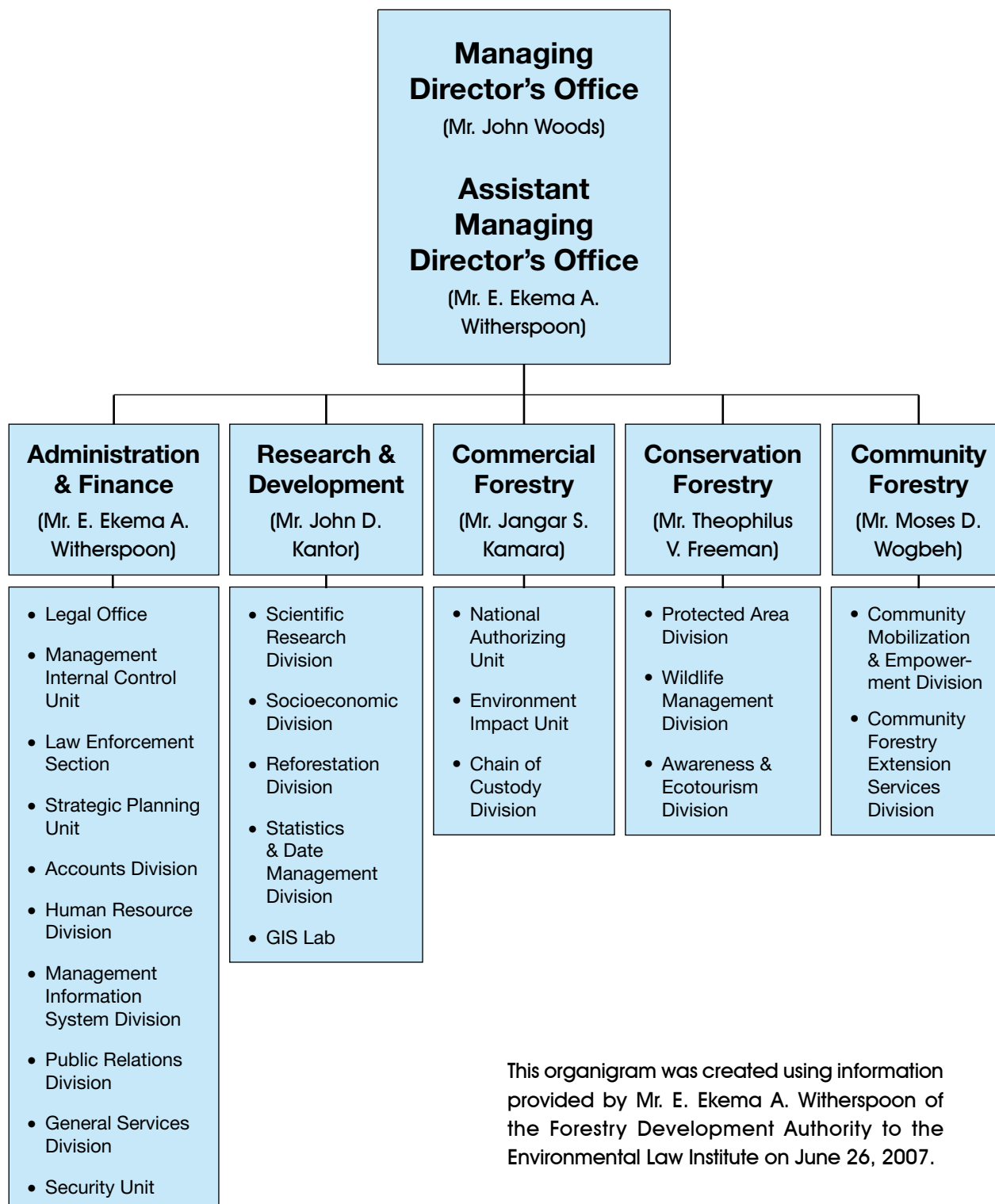
Liberia and its communities rely on the country's rich biodiversity for livelihoods, food, and other environmental services. Recent legal and institutional developments to effectively and sustainably manage biodiversity are promising; however, much work remains to be done. This Assessment analyzes the priority needs regarding the conservation and sustainable management of biodiversity in Liberia. It does so by undertaking a comprehensive, integrated examination of the laws, policies, and institutions governing biodiversity, as well as scientific considerations necessary to make biodiversity-related decisions. The Assessment analyzes both the strengths and gaps of the current laws and regulations, providing a road map for government bodies, international organizations, NGOs, and others interested in improving the conservation of biodiversity in Liberia.

After a dark period in Liberia's history, encouraging developments with respect to biodiversity are under way. Liberia passed a comprehensive Forestry Law in October 2006 and is now in the process of developing regulations to implement the Law. At the same time, as this Assessment demonstrates, biodiversity protection in Liberia could benefit

from additional legal, scientific, and institutional developments. As articulated throughout this Assessment, these developments include the enactment of regulations to further define and implement statutory directives; strengthened provisions for public participation in the enactment and enforcement of biodiversity-related laws; and stronger links among sectoral laws and agencies. In addition, scientific research is needed to monitor, assess, and map biodiversity; identify key drivers of land-use change; and evaluate social values in relation to biodiversity. Particular needs with respect to institutional capacity include equipment and logistical supplies; investment in human resource development; and greater cooperation and collaboration among government, NGO, and quasi-government institutions.

Great strides have been made, and real progress achieved, in Liberia over the past year. Yet this is only a start. Currently, a unique window of opportunity exists in which to strengthen the necessary laws and regulations and to build capacity for implementation and enforcement. The decisions that are made in the next few years will be crucial in determining Liberia's ecological and economic future. This Assessment seeks to provide an informed basis upon which to make such decisions.

Annex I: Forestry Development Authority Organigram



Annex II: Endnotes

- 1 See also Critical Ecosystem Partnership Fund, "Upper Guinean Forest Ecosystem of the Guinean Forests of West Africa Biodiversity Hotspot," available at http://www.cepf.net/ImageCache/cepf/content/pdfs/final_2eguineanforests_2eupperguineanforest_2eep_2epdf/v1/final.guineanforests.upperguineanforest.ep.pdf.
 - 2 See Liberia's National Biodiversity Strategy and Action Plan, available at <http://www.biodiv.org/reports/list.aspx?type=all&alpha=L>; see also United Nations Environment Programme, *Desk Study on the Environment in Liberia* (2004) (hereafter "UNEP Desk Study") at 33, 43-47, 62.
 - 3 While this Assessment considers some laws that indirectly affect biodiversity, it does not necessarily analyze all sectoral laws with attendant impacts on biodiversity.
 - 4 See <http://www.fao.org/forestry/site/lfi/en>. As an active member of the LFI, the Environmental Law Institute ("ELI") has played an instrumental role in working with Liberians and other LFI partners to craft the new forestry law and regulations. For additional background information about LFI, see J.L. McAlpine, P.A. O'Donohue, and O. Pierson, "Liberia: forests as a challenge and an opportunity," *International Forestry Review* Vol. 8(1), 2006.
 - 5 In accordance with the Terms of Reference for this project, this report does not address the institutional capacity of the Environmental Protection Agency (EPA).
 - 6 For instance, see Chapter 8 of the New Minerals and Mining Law (2000), which imposes obligations on holders of mineral rights to take steps to protect and restore the environment; and Chapter 10, which subjects mining activities to legislation on protected forests. This law is described in Anyaa Vohiri's "A Study to Clarify the Protected Forest Types Officially/Legally Recognized in Liberia," Report prepared for the Liberia Forest Reassessment Project (November 2002) (hereafter "Vohiri Study"), Section 6.1.
 - 7 An Act Creating the Forestry Development Authority (December 1976) (hereafter "1976 FDA Act"), amended by An Act to Amend an Act Creating the Forestry Development Authority by Repealing Section 16 Thereof and Adding Thereto Eight New Sections (August 1988) and An Act Adopting the National Forestry Reform Law of 2006.
 - 8 An Act Adopting the National Forestry Reform Law of 2006 (Amending the National Forestry Law of 2000, As Amended; And Amending An Act Creating the Forestry Development Authority, As Amended) (hereafter "2006 Forestry Law").
 - 9 An Act Creating the Environment Protection Agency of the Republic of Liberia (April 30, 2003) (hereafter "2003 EPA Act").
 - 10 An Act Adopting the Environment Protection and Management Law of the Republic of Liberia (April 30, 2003) (hereafter "2003 Environment Protection and Management Law").
 - 11 An Act Adopting the New National Forestry Law (December 11, 2000) (hereafter "2000 Forestry Law"), amended by An Act for the Establishment of a Protected Forest Areas Network and Amending Chapters 1 and 9 of the New National Forestry Law, Part II, Title 23 of the Liberian Code of Law Revised and Thereto Adding Nine New Sections (Oct. 24, 2003) (hereafter "2003 Protected Forest Areas Network Law"). Citations to the 2000 Forestry Law include the changes wrought by the 2003 version, which amended and added to the 2000 Law rather than repealing it in its entirety.
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- 12 An Act Adopting a New Wildlife and National Parks [Law] and Repealing Chapters 1, 2, 3, and Subchapters A and C of Chapter 4, Title 24 of the Natural Resources Law, Volume 5 of the Liberian Code of Laws of 1956, Relating to Conservation of Forests, Forest Reserves, Conservation of Wildlife and Fish Resources and National Parks (September 1, 1988) (hereafter “1988 Wildlife and National Parks Law”).
- 13 No regulations have been enacted under the 2003 EPA Act or the 2003 Environment Protection and Management Law.
- 14 The four new draft regulations most relevant to biodiversity are: Public Participation in Promulgation of Regulations, Codes, and Manuals (Regulation No. 101-6); Forest Land Use Planning (No. 102-6); Benefit Sharing (No. 106-6); and Penalties (No. 109-6).
- 15 See <http://www.iucn.org/themes/wcpa/ppa/protectedareas.htm>.
- 16 For more information on protected areas, see Protected Areas and World Heritage, at http://www.unep-wcmc.org/protected_areas/; World Commission on Protected Areas, at <http://www.iucn.org/themes/wcpa/>.
- 17 While the conventions referenced in this document were established to support international rather than national objectives, they can lay the groundwork for domestic regulation in the thematic areas addressed by this report.
- 18 Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818 (entered into force Dec. 29, 1993). For a list of all reports submitted by Liberia to the CBD, see <http://www.biodiv.org/reports/list.aspx?type=all&alpha=L>.
- 19 Convention on Wetlands of International Importance, Feb. 2, 1971, 11 I.L.M. 963 (entered into force Dec. 21, 1975) (hereafter “Ramsar Convention”).
- 20 African Convention on the Conservation of Nature and Natural Resources, Sept. 15, 1968, 1001 U.N.T.S. 4 (entered into force June 16, 1969) (hereafter “African Convention”).
- 21 United Nations Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 851 (entered into force March 21, 1994) (hereafter “UN Convention on Climate Change”).
- 22 The delineation of categories, which was imported from the 2000 Forestry Law, is provided in “USDA Forest Service Support to Wildlife Conservation in Liberia: Development of a Wildlife Management and Enforcement Strategy” (2005) (hereafter “U.S. Forest Service Report”), Appendix X, at 11.
- 23 For more on the current state of community forestry in Liberia, see, e.g., “Proceedings of the first international workshop on community forestry in Liberia” (December 12-15, 2005) (hereafter “2005 Community Forestry Workshop”), and discussion under Section 5, Community-Based Natural Resource Management, *infra*.
- 24 According to most sources, Liberia contains one existing national park (Sapo National Park). See National Biodiversity Strategy and Action Plan, *supra* note 2, at 46-47; UNEP Desk Study, *supra* note 2, at 64. However, the World Database on Protected Areas lists three additional national parks in Liberia: Cestos Sankwen, Lofa-Mano, and Tienpo. See <http://sea.unep-wcmc.org/wdbpa/> (follow “search for sites” button at left).
- 25 See An Act for the Extension of the Sapo National Park (Oct. 10, 2003).

- 26 See An Act for the Establishment of the East Nimba Nature Reserve (Oct. 10, 2003).
- 27 See World Database on Protected Areas, <http://sea.unep-wcmc.org/wdbpa/> (follow “search for sites” button at left). The UNEP Desk Study (note 2) includes all of these except the Belle National Forest (p. 64).
- 28 The World Database on Protected Areas (note 26) lists 3 Nature Conservation Units (Cape Mount, Wologizi, and Wonegizi), while the UNEP Desk Study (note 2) only lists Cape Mount (p. 64).
- 29 See National Biodiversity Strategy and Action Plan, *supra* note 2, at 50-51 (discussing proposed new protected areas in Liberia); “A Report on Legislation and Institutions” by Roland F. Dahn (December 24, 2002) (hereafter “Dahn Report”), at III(a)(2) (explaining that six new national parks were earmarked a number of years ago, but the appropriate legislation had not been passed).
- 30 Section 3 of the Law defines “wetland” as “an area permanently or seasonally flooded or saturated by water where plants and animals have become adapted.”
- 31 With the exception of national parks, which are defined in the 2006 Forestry Law, the Environment Protection and Management Law does not define these reserves, sanctuaries, or other areas.
- 32 Chapter 8 of the 2006 Forestry Law imposes additional requirements on FDA’s oversight of forest harvesting, including the use of environmentally sound harvesting practices in accordance with internationally acceptable principles (8.1(a)), monitoring of forest operations (8.2(a)), reforestation/afforestation (8.3(a)), wetlands protection (8.3(b)), and the use of best practices silvicultural treatment (8.3(d)), among other things.
- 33 Although Section 9.10(b)(5) of the 2006 Forestry Law neither prohibits nor allows hunting in National Forests, the definition of National Forest in Section 1.3 includes hunting activities. This appears to conflict with Regulation 25, written in reference to the 1988 Wildlife and National Parks Law, which prohibits hunting in National Forests.
- 34 Regulation 25 was apparently enacted under the repealed 1988 Wildlife and National Parks Law, even though it was signed after the 2000 Forestry Law came into force.
- 35 Several of the recommended additions existed under the now-repealed 1988 Wildlife and National Parks Law.
- 36 For more information about establishing protected forest areas, see Dr. Chris Magin, Fauna & Flora International and Theophilus Freeman, Liberian Forestry Development Authority, “Guidelines for protected forest area creation (and expansion) in Liberia” (February 2003) (report prepared for the Liberia Forest Reassessment Project).
- 37 See Richard Sambola, Fauna & Flora International, “Report on the Rapid Faunal Surveys of Seven Liberian Forest Areas Under Investigation for Conservation” (August 2005) (hereafter “Report on Rapid Faunal Surveys”) (presenting results of faunal surveys of seven forest areas with a potential high conservation value).
- 38 *Id.* at 5.
- 39 See UNEP Desk Study, *supra* note 2, at 65.

- 40 Section 26 of the repealed 1988 Wildlife and National Parks Law did require FDA to consult with local residents in the administration and management of National Parks and Nature Reserves, and provided authority to do so through the creation of Local Advisory Committees.
- 41 See 16 U.S.C. § 1a-7(b) (discussing general management plans for the U.S. national park system).
- 42 Vohiri Study, *supra* note 6, at Section 7.
- 43 See Executive Order No. 1, GOL Forest Sector Reform (February 2, 2006) (hereafter “Executive Order”). The reform measures are set forth at ¶ 7.
- 44 Food and Agriculture Organization, *Workshop on Tropical Secondary Forest Management in Africa: Reality and Perspectives* (Nairobi, Kenya, Dec. 9-13, 2002), Excerpt from 2.6 Thematic Paper on Socio-economic Issues, Section 2.15: Management and uses of sacred groves (traditional forest reserves), available at <http://www.fao.org/docrep/006/J0628E/J0628E00.HTM>; see also Ngouffo & Tschoffo, B., “Culture and Sustainable Management of Natural Resources in Africa: Basic Research Report on the present state of knowledge” (International Conference on the Cultural Approach to Development in Africa, Dakar, Senegal, Dec. 10-14, 2001), available at <http://unpan1.un.org/intradoc/groups/public/documents/IDEP/UNPAN003344.pdf>.
- 45 See International Workshop on the Local Management of Agricultural Biodiversity, Summary of West Africa (Brazil, May 9-19, 2002), at 4-5, available at <http://www.grain.org/gd/en/a-rd-iw/wa-rd-summaryreport-en.doc>.
- 46 Although Section 9.8 of the 2006 Law does require FDA to review and republish management plans for individual protected areas every five years, this requirement does not appear to apply to the Protected Forest Areas Network as a whole. Similarly, Section 9.1(c)’s directive that FDA seek advice from the Forest Management Advisory Committee and others regarding management of the Network does not sufficiently require periodic review by itself. Further, while the 1976 FDA Act directs FDA to submit an Annual Report to the President, the content of this Report is largely financial.
- 47 Section 12 of the 1988 Wildlife and National Parks Law provided this authority through the designation of a potential National Park or Nature Reserve as a Game Reserve.
- 48 Additionally, many countries facilitate access by nationals by charging them only nominal fees, while setting higher fees for foreign visitors. “Ecotourism” revenue can be an important source of income for the management of protected areas as well as the sustainable development of adjacent communities. See, e.g., S.S. Ajayi, Food and Agriculture Organization, Wildlife Conservation Issue Paper (February 2002) (hereafter “Wildlife Conservation Issue Paper”), at 17-18. See also discussion under Section 5, Community-Based Natural Resource Management.
- 49 See Ben Turtur Donnie, *CBD Thematic report on protected areas or areas where special measures need to be taken to conserve biological diversity* (undated), available at <http://www.biodiv.org/doc/world/lr/lr-nr-pa-en.doc>.
- 50 See U.S. Forest Service Report, *supra* note 22, at 2, 4 (recommending creation of a separate agency with responsibility over parks and wildlife, or a strengthened wildlife section within FDA); see also Wildlife Conservation Issue Paper, *supra* note 48, at 19.

- 51 See note 22, *supra*, at Appendix XII. The U.S. Forest Service recommends that Liberia address protected areas and wildlife conservation in a single law, pointing to the example of other African countries and some U.S. states. *Id.* at 3 and Appendix XII. In order to isolate and address the legal, institutional, and scientific issues underlying both protected areas and species protection, this Report will analyze each area separately, regardless of whether they are formally governed by a single law or a series of laws.
- 52 Margules, C. R., and R. L. Pressey. 2000. Systematic conservation planning. *Nature* 405:243-253.
- 53 Soule, M. E., J. A. Estes, J. Berger, and C. M. Del Rio. 2003. Ecological effectiveness: conservation goals for interactive species. *Conservation Biology* 17:1238-1250.
- 54 Jennings, M. D. 2000. Gap analysis: concepts, methods, and recent results. *Landscape Ecology* 15:5-20.
- 55 Veldkamp, A., and E. F. Lambin. 2001. Predicting land-use change. *Agriculture, Ecosystems and Environment* 85:1-6.
- 56 A copy of the CD detailing these priorities can be obtained from the Center for Applied Biodiversity Science, 1919 M St. NW, Suite 600; Washington, DC 20036.
Tel: (202) 912-1000, email: infotools@conservation.org.
- 57 Poorter, L., F. Bongers, F. N. Kouamé, and W. D. Hawthorne, editors. 2004. *Biodiversity of West African Forests: An Ecological Atlas of Woody Plant Species*. CAB International, Wallingford, UK.
- 58 Gatter, W. 1998. *Birds of Liberia*. Yale University Press, New Haven, USA.
- 59 Voorhoeve, A.G. 1965 "Liberian High Forest Trees - A Systematic Botanical Study of the 75 Most Important or Frequent High Forest Trees, with Reference to Numerous Related Species" - Wageningen (The Netherlands).
- 60 Hawthorne, W. D., and C. C. H. Jongkind. 2005. *The woody plants of western African forests: A guide to the forest trees, shrubs and lianes from Senegal to Ghana*. Royal Botanical Gardens Kew, London, UK.
- 61 Regional coordinating institute: International Institute of Tropical Agriculture, 08 B.P. 0932 Tri Postal, Cotonou, Republic of Benin.
- 62 Jongkind, C.C.H. (2004) A checklist of Upper Guinea forest species. In Poorter, L., F. Bongers, F. N. Kouamé, & W. D. Hawthorne, editors. *Biodiversity of West African Forests: An Ecological Atlas of Woody Plant Species*. CAB International, Wallingford, UK.
- 63 IUCN, 2001. Categories and Criteria (version 3.1). IUCN Red List of Threatened Species, available at http://www.iucnredlist.org/info/categories_criteria2001. This site provides a detailed description of the criteria and classification methods for classifying species at high risk of global extinction.
- 64 ITTO 2006. Status of Forest Management 2005. International Tropical Timber Organization Technical Report No. 24, Yokohama, Japan.
- 65 Hawthorne, W. D., and M. Abu-Juam. 1995. Forest protection in Ghana with particular reference to vegetation and plant species. IUCN Forest Conservation Programme, Gland, Switzerland.
- 68 Assessment of the Legal, Scientific, and Institutional Framework for Biodiversity Protection in the Republic of Liberia

- 66 Gibbons, P., A. Zenger, S. Jones, and P. Ryan 2006. Mapping vegetation condition in the context of biodiversity conservation. *Ecological Management and Restoration* 7:S1-S2.
- 67 Cotgrove, S., and A. Duff. 1981. Environmentalism, Values and Social Change. *The British Journal of Sociology* 32:92-110.
- 68 Jepson, P., and S. Canney. 2003. Values-led conservation. *Global Ecology & Biogeography* 12:271-274.
- 69 See National Biodiversity Strategy and Action Plan, *supra* note 2, at 73-79; see also UNEP Desk Study, *supra* note 2, at 33, 43-47, 62.
- 70 The Convention on the International Trade in Endangered Species (CITES) will be addressed in Section 3 (Trade in Species), *infra*.
- 71 Note 18, *supra*.
- 72 Note 19, *supra*.
- 73 Note 20, *supra*.
- 74 These penalties correspond to provisions of the repealed 1988 Wildlife and National Parks Law rather than the 2006 Forestry Law.
- 75 The draft proposed by the U.S. Forest Service includes the following features: (1) more definitions, including definitions for the different types of protected areas and the distinction between “fully protected” and “partially protected” species; (2) an updated list of fully protected species (though this must be verified); (3) lower license fees for hunters and bushmeat traders, on the grounds that this would generate more revenue (because these licenses would become more affordable) and provide for greater monitoring by the FDA; (4) explicit prohibitions on activities in each type of protected area; and (5) a more complete list of offenses and penalties. See 2005 Report, *supra* note 22, at Appendix XV.
- 76 Section I of Regulation 25 sets forth a list, containing 15 species, of “Liberian Fully Protected Animals and Their Local Names.” This Section defines protected animals as “animals listed under Section 60 of the Wildlife and National Parks Act of 1988.” Section VI of the regulation includes a separate list, containing seven species, of “Liberian Endangered Animal Species.” The basis for this second list is unclear. All seven species listed in Section VI are found within the larger list included in Section I.
- 77 Information about the distribution of threatened and endangered wildlife, particularly on private lands, can be very sensitive. This data is typically treated as confidential, to prevent hunters, developers, and others from taking steps that could intentionally harm species populations. See National Biodiversity Network, “Information Management: A Step-by-Step Approach,” available at http://www.nbn.org.uk/information/info.asp?level1id=1&level2id=10&level3id=59&level4id=&cat_id=111 (click on link on right-hand side, entitled “Information management - a step by step approach - v1.3.DOC”).
- 78 As the U.S. Forest Service Report (note 22, *supra*) points out, FDA may well lack the current capacity to conduct periodic wildlife surveys. The Report suggests a methodology for extrapolating wildlife distribution from measures of bushmeat harvesting in different parts of the country (p. 5).

- 79 Section 37 provides as follows:
Prohibited Hunting Methods. – No person shall employ, or possess for the purpose of employing, any of the following for the purpose of hunting or capturing any animal:
- (a) Any drug, poison, poisoned weapons or poisoned bait;
 - (b) Any explosive or any missile containing a detonator;
 - (c) Any deadfall, pit or set gun;
 - (d) Any electronic device or recording to attract animals;
 - (e) Any tension, steel jawed or leg-hold trap;
 - (f) Any artificial light, including flashlight, headlamp, headlight or other illuminating device;
 - (g) Any firearm capable of firing more than one round at each pull of the trigger, or any type of firearm prohibited in any regulation issued under this Act;
 - (h) Any other method of hunting or capturing animals prohibited in any regulation issued under this Act.
- 80 See Section 52, Inspection and Arrest Powers.
- 81 The U.S. Forest Service Report recognized that several of these provisions in the 1988 Wildlife and National Parks Law could form the core of an effective bushmeat conservation strategy. Appendix X, *supra* note 22, at 2.
- 82 *But see* note 33, *supra*.
- 83 The regulation of fishing activities can have important consequences for bushmeat populations. See Brashares, et al., *Bushmeat Hunting, Wildlife Declines, and Fish Supply in West Africa*, Science Vol. 36 (12 Nov. 2004), at 1180-83 (correlating dwindling fish supply with increased hunting in nature reserves).
- 84 See *also* Wildlife Conservation Issue Paper, *supra* note 48, at 19 (ix).
- 85 Consultant's Report on the Review of Existing Environmental Legislation and Institutional Arrangements for the Management of the Environment and Natural Resources (undated) (hereafter "Consultant's Report"), at 12.
- 86 See background information on CITES, *available at* <http://www.cites.org/eng/disc/what.shtml>.
- 87 Hoyt, R.A. 2004. Wild meat harvest and trade in Liberia: managing biodiversity, economic and social impacts. *ODI Wildlife Policy Briefing 6:1-4, Table 2, available at* <http://www.odi.org.uk/fpeg/publications/policybriefs/wildlifepolicy/downloads/WPB6final.pdf>. For more information on Liberia's bush meat market, see Wildlife Conservation Issue Paper, *supra* note 48, at 20-25.
- 88 Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 1087, T.I.A.S. No. 8249, 993 U.N.T.S. 243 (hereafter "CITES").
- 89 Note 20, *supra*.
- 90 International Tropical Timber Agreement, Jan. 27, 2006.
- 91 The granting of permits under 13.1(b)(ii) is presumed to be limited to scientific research purposes only, as required under 13.1(b)(i), although this is not stated in the text of 13.1(b)(ii).

- 92 See “National laws for implementation of the Convention,” SC54 Doc. 36 (updated on August 15, 2006), *available at* <http://www.cites.org/eng/com/SC/54/E54-36.pdf>.
- 93 See “Notification to the Parties Concerning Djibouti, Guinea-Bissau, Liberia and Rwanda: Reissue of a recommendation to suspend trade” (December 14, 2006), *available at* <http://www.cites.org/eng/notif/2006/E073.pdf>.
- 94 Article III(2).
- 95 Section 12.1(b)(iii).
- 96 Section 13.1(c).
- 97 Articles III(5) & IV(6).
- 98 These include a finding by a country’s Scientific Authority that the export of the species will not be detrimental to the survival of that species, and findings by the Management Authority that the specimen was harvested in accordance with domestic law and will be prepared and shipped so as to minimize the risk of injury, damage to health or cruel treatment. Art. IV.
- 99 Appendix III species are listed by individual countries. See list of CITES species, *available at* <http://www.cites.org/eng/app/appendices.shtml>.
- 100 Section 48 of the repealed 1988 Wildlife and National Parks Law specified minimum and maximum fee amounts for export permits.
- 101 Lawrence Greene, Head of Extension Services, Department of Community-Based Forest Management, FDA, personal communication with Paul Jarvan (October 23, 2006).
- 102 Abana K. Tawreh, Wildlife Section, FDA, personal communication with Paul Jarvan (December 18, 2006) (hereafter “Tawreh Interview”).
- 103 Tawreh Interview.
- 104 Fa, J. E., C. A. Peres, and J. Meeuwig. 2002. Bushmeat Exploitation in Tropical Forests: an Intercontinental Comparison. *Conservation Biology* 16:232-237.
- 105 See Hoyt, *supra* note 87.
- 106 Blundell, A. G. 2003. A New Environment for Liberia - A road map for the forest sector. Outcome of US Embassy Workshop on Forest Sector reform (December 15 & 16, 2003 – Monrovia). 38 pp. USAID, Monrovia.
- 107 Frayne, J. M. 2002. The bushmeat trade in Liberia, West Africa: Preliminary findings in wildlife harvest, market structure, and consumption trends. Unpublished Master’s Thesis, Millersville University, Millersville, PA.
- 108 Peres, C. A. 2000. Effects of Subsistence Hunting on Vertebrate Community Structure in Amazonian Forests. *Conservation Biology* 14:240-253.
- 109 Contact details: Dr. Kate Abernethy, k.a.abernethy@stir.ac.uk, School of Biological and Environmental Sciences, University of Stirling, Stirling FK9 4LA, Scotland UK.

- 110 ITTO, 2006. Status of Forest Management 2005. International Tropical Timber Organization, Yokohama, Japan.
- 111 For a list of invasive species in Liberia, see the National Biodiversity Strategy and Action Plan, *supra* note 2, at 81-82.
- 112 See Convention on Biological Diversity, Invasive Alien Species Introduction, available at <http://www.biodiv.org/programmes/cross-cutting/alien/default.aspx>.
- 113 See, e.g., National Invasive Species Information Center, <http://www.invasivespeciesinfo.gov/>; U.S. Fish and Wildlife Service, Division of Environmental Quality, <http://www.fws.gov/contaminants/Issues/InvasiveSpecies.cfm>; Meinhard Doelle, Legal and Policy Responses to Invasive Species, Background Paper Prepared for the Commission for Environmental Cooperation (March 1, 2001), available at www.cec.org/files/PDF/BIODIVERSITY/Legal-Policy-Responses-InvasivesSpecies_en.pdf.
- 114 Note 18, *supra*.
- 115 Note 20, *supra*.
- 116 Note 19, *supra*.
- 117 For more information on legal tools for managing invasive species, see generally Halting the Invasion: State Tools for Invasive Species Management (Environmental Law Institute, 2002).
- 118 *Id.*
- 119 For examples of Early Detection/Rapid Response plans, see Rapid Response Plan for Invasive Aquatic Plants, Fish, and Other Fauna (Maine Department of Inland Fisheries and Wildlife and Department of Environmental Protection, available at <http://www.maine.gov/dep/blwq/topic/invasives/invplan.htm>; Model Rapid Response Plan for Great Lakes Aquatic Invasions (Great Lakes Commission), available at http://www.glc.org/ans/pdf/ModelRRPlan-II_04-04.pdf; and General Guidelines for the Establishment and Evaluation of Invasive Species Early Detection & Response Systems (National Invasive Species Council), available at http://invasivespecies.nbi.gov/documents/inv_NISCEDRRGuidelineCommunication.pdf.
- 120 See U.S. Department of State, Background Note: Liberia, available at <http://www.state.gov/r/pa/ei/bgn/6618.htm#econ>.
- 121 For a detailed discussion on this issue, from which much of this analysis has been drawn, see Wildlife Conservation Issue Paper, *supra* note 48, at 13-15.
- 122 Consultant's Report, *supra* note 85, at 1-2. See also Liberia Forest Reassessment Project, Draft Manual for the Establishment of Communal Forests in Liberia (2004), Part 2 (Background).
- 123 Wildlife Conservation Issue Paper, *supra* note 48, at 14. See also Report on Rapid Faunal Surveys, *supra* note 37, at 8, 13-15, 17 (citing opposition from local communities to the establishment of protected areas, based on a fear that such areas will deprive people of opportunities to earn a living through hunting and farming).

- 124 Note 18, *supra*.
- 125 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, U.N. Doc. A/AC.241/15/Rev.7, reprinted in 33 I.L.M. 1328 (1994) (hereafter “UN Convention to Combat Desertification”).
- 126 For more information on community forestry in Liberia, see generally Community Forestry Workshop, *supra* note 23.
- 127 The stakeholders identified by the Draft Manual (Section 3) include:
- (1) FDA (forest sector);
 - (2) Ministry of Internal Affairs (local/tribal rights and administration);
 - (3) Communities surrounding Sapou National Park and others likely to be affected by the CF;
 - (4) Traditional authorities;
 - (5) Logging or other concessionaries; and
 - (6) Conservation and community development NGOs/CBOs.
- 128 Such criteria include the ecological landscape; a recognition of the cultural, social, and economic values of traditional forest users; and different ways to identify the community itself (e.g. individual villages, village clusters, ethnic groups, political groupings, etc.) (Section 4).
- 129 Native Authority Forest Reserves were also created under Section VII of An Act for the Conservation of the Forests of the Republic of Liberia (1953), which was repealed by the 2000 Forestry Law. See Vohiri Study, *supra* note 6, at Sections 5.1(a), 5.2(a).
- 130 See Wildlife Conservation Issue Paper, *supra* note 48, at 18.
- 131 See also Julu Johnson, Ministry of Lands, Mines, and Energy, “The land tenure system in Liberia: Finding space for community forestry,” in 2005 Community Forestry Workshop, *supra* note 23, at 41.
- 132 See generally Wells M. & K. Brandon, *People and Parks: Linking Protected Area Management with Local Communities*. Washington DC (World Bank 1992).
- 133 The 2006 Forestry Law does provide for public participation in the promulgation of regulations, including a 60-day public comment period (Section 19.2(a)).
- 134 Wildlife Conservation Issue Paper, *supra* note 48, at 8, 26-27.
- 135 The U.S. Forest Service Report describes one such project in Ghana, where the Wildlife Division is working with communities to create Community Resource Management Areas (CREMA). These areas, which consist of forest areas set aside for wildlife farming, afford communities protein, income, and employment, and can also help establish or expand wildlife habitat and corridors. See U.S. Forest Service Report, Appendix X, at 3; Forestry Commission of Ghana, Wildlife Division (http://www.fcghana.com/forestry_commission/wildlife.htm).
- 136 Sec. 9.10(b)(iii) & (vi).
- 137 Wildlife Conservation Issue Paper, *supra* note 48, at 14.

- 138 Id.
- 139 Id.
- 140 See Conservation International's description of Biodiversity Hotspots, available at http://www.biodiversityhotspots.org/xp/Hotspots/west_africa/.
- 141 See The Annotated Ramsar List: Liberia, available at http://www.ramsar.org/profile/profiles_liberia.htm.
- 142 Other permanent wetlands include Lake Shepherd, Bafu Bay, and Cestos-Senkwehn. The Cestos-Senkwehn wetland is also being considered for protected status (UNEP Desk Study, supra note 2, at 52).
- 143 Note 19, supra.
- 144 Note 20, supra.
- 145 Note 125, supra.
- 146 See Augustsu B.G. Fahnbulleh, Ministry of Agriculture, National Quarantine and Environmental Service Department of Technical Services, personal communication to Paul Jarvan (noting that the inadequate management of solid and liquid waste in Monrovia is threatening biodiversity conservation).
- 147 See UNEP Desk Study, supra note 2, at 27-28, 31, and 55-56.
- 148 Id. at 28.
- 149 Much of the material in this section has been drawn from Agenda 21, available at <http://www.igc.org/habitat/agenda21>, as well as Julian Kinderlerer, "Regulation of Biotechnology: Needs and Burdens for Developing Countries," Sheffield Institute of Biotechnological Law & Ethics (undated) (hereafter "Kinderlerer Paper"), available at <http://www.unep.ch/biosafety/development/devdocuments/BTregulationJK.pdf>.
- 150 See Organization for Economic Co-operation and Development, Statistical Definition of Biotechnology, available at http://www.oecd.org/document/42/0,2340,en_2649_34409_1933994_1_1_1_1,00.html.
- 151 See Richard Braun and Klaus Ammann, "Biodiversity: The Impact of Biotechnology," at 8, 11, available at www.botanischergarten.ch/EFB/UNESCO-Biodiv-Biotech-Final.pdf.
- 152 Id.
- 153 UNEP International Technical Guidelines for Safety in Biotechnology, ¶ 7 (hereafter "UNEP Guidelines"), available at <http://www.biosafetyprotocol.be/UNEPGuid/Contents.html>.
- 154 Third World Network, An Introduction to the Model National Law on Biosafety, available at <http://www.twinside.org.sg/title/national-cn.htm> (hereafter Model National Biosafety Law).
- 155 As used by the Cartagena Protocol, Article 1, biosafety involves "the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse

effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.”

- 156 Note 18, *supra*.
- 157 Note 20, *supra*.
- 158 Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Jan. 29, 2000, 39 I.L.M. 1027 (entered into force Sept. 11, 2003) (hereafter “Cartagena Protocol”).
- 159 Kinderlerer Paper, *supra* note 149, at 5; UNEP Guidelines, *supra* note 153. The Model National Biosafety Law, *supra* note 154, sets forth a more detailed national framework containing 19 separate elements.
- 160 UNEP Guidelines, *supra* note 153, at ¶10.
- 161 Kinderlerer Paper, *supra* note 149, at 8-11.
- 162 *Id.* at 8.
- 163 Model National Biosafety Law, *supra* note 154, Annex III(A)(1).
- 164 Annex I to the Model National Biosafety Law (*supra* note 154) contains information about what must be included in the application, while Annex III includes information about the procedures and content of the risk assessment.
- 165 Framework for Environmental Health Risk Management, The Presidential/Congressional Commission on Risk Assessment and Risk Management, Final Report. Volume 1 (1997), at 1 (cited in Kinderlerer Paper, *supra* note 149, at 10), *available at* <http://www.riskworld.com/nreports/1997/risk-rpt/pdf/EPAJAN.PDF>.
- 166 Model National Biosafety Law, *supra* note 154, at ¶ 11.
- 167 *Id.*
- 168 *Id.*
- 169 Hilbeck, A., Andow, D.A. (Eds.), 2004. Environmental Risk Assessment of Genetically Modified Organisms. CAB International, Wallingford, UK.
- 170 Biosecurity in Food and Agriculture Discussion Paper (FAO, Committee on Agriculture 17th Session, Rome, April 2003).
- 171 Advisory Committee on Releases to the Environment, 2004. Guidance on Best Practice in the Design of Post-market monitoring Plans in Submissions to the Advisory Committee on Releases to the Environment. Department for Environment, Food and Rural Affairs: London; *available at* http://www.defra.gov.uk/environment/acre/postmarket/acre_postmarketmonitor-guidance.pdf.
- 172 Opinion of the Scientific Panel on Genetically Modified Organisms on the Post Market Environmental Monitoring (PMEM) of genetically modified plants. The EFSA Journal (2006) 319, 1-27; *available at* http://www.efsa.europa.eu/science/gmo/gmo_opinions/1381/gmo_op_ej319_pmem_en1.pdf.

- 173 Much of the analysis in this paragraph has been drawn from Environmental Law Institute, *African Perspectives on Genetic Resources: A Handbook on Laws, Policies, and Institutions* (Nnadozie et al., Eds. 2003) at 14-17.
- 174 *Id.* at 18-19.
- 175 *Id.* at 20-21.
- 176 Note 18, *supra*.
- 177 Note 20, *supra*.
- 178 International Treaty on Plant Genetic Resources for Food and Agriculture, Nov. 3, 2001 (entered into force June 29, 2004), <http://www.fao.org/AG/cgrfa/itpgr.htm>.
- 179 The National Biodiversity Strategy and Action Plan, *supra* note 2, provides more detail about seed banks in Liberia (p. 58).
- 180 Much of the information in this section is derived from the African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources (2000) (hereafter "African Model Law") and Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of Their Utilization (2002) (hereafter "Bonn Guidelines"). For more information on genetic resources policy, see the Genetic Resources Policy Initiative (GRPI), a project "that aims to strengthen the capacity of developing countries to design comprehensive policy frameworks for genetic resources," at <http://www.grpi.org/index.php>.
- 181 Although Section 3 of the 2003 Law provides a definition of "trade", this definition seems limited to pollution-producing activities (e.g. those resulting in the "discharge of substances and energy").
- 182 For more information on the link between community forests and access to genetic resources, see the National Biodiversity Strategy and Action Plan, *supra* note 2, at 51-52.
- 183 The Bonn Guidelines, *supra* note 180, also set forth responsibilities for a Competent National Authority, at 4-5.
- 184 For additional information on impact assessment, see the Convention on Biological Diversity, "Impact Assessment Introduction," at <http://www.biodiv.org/programmes/cross-cutting/impact/default.asp>; International Association for Impact Assessment, "Principles of Environmental Impact Assessment Best Practice," at http://www.iaia.org/Members/Publications/Guidelines_Principles/Principles%20of%20IA.PDF.
- 185 Note 21, *supra*.
- 186 Note 18, *supra*.
- 187 Note 19, *supra*.
- 188 In addition to the EPA framework, the 2006 Forestry Law (Section 5.6(d)) requires applicants for a Private Use Permit to comply "with all legal requirements for environmental impact assessment."
- 189 This report will use "EIS" to refer to the Environmental Impact Statement rather than the Environmental Impact Study, as it is the Statement that contains information relevant to EPA's analysis of a project.

- 190 Although Section 30(3) does not clarify whether only decisions issued upon reconsideration may be appealed to the Environmental Court, an interpretation to the contrary would render the provisions on reconsideration superfluous.
- 191 Under this section, an EIA license or permit is required for:
- (a) any activity out of character with its surroundings;
 - (b) any structure of a scale not in keeping with its surroundings; and
 - (c) major changes in land use.
- 192 Note 18, *supra*.
- 193 Note 88, *supra*.
- 194 Note 125, *supra*.
- 195 Note 20, *supra*.
- 196 Note 21, *supra*.
- 197 Note 90, *supra*.
- 198 Discussion of the laws regulating public access to information is found under Section 12, *infra*.
- 199 Interviews with Liberian officials suggest that some data collection by government agencies is, in fact, conducted in collaboration with local communities. Joseph N. Toah, Acting Head, Division of Wildlife, National Parks, and Recreation, FDA, Personal Communication with Paul Jarvan (May 30, 2006). However, this practice is not required under the current law.
- 200 Much of the information in this section has been drawn from Robert B. McKinstry Jr., James McElfish, and Michael Jacobson, "Coordination and Planning Tools That Can Be Applied to Biodiversity Conservation," in *Biodiversity Conservation Handbook: State, Local & Private Protection of Biological Diversity* (Robert B. McKinstry, Jr., Corren M. Ripp, and Emily Lisy Eds., 2006), at 203-08. For more information on biodiversity planning, see Global Environment Facility, Biodiversity Planning Support Programme, at <http://www.unep.org/bpsp/TS.html>; see also the African Wildlife Foundation, *Biodiversity Planning Manual* (Biodiversity Information Package #3), available at <http://www.zamsoc.org/documents/Biodiversity%20Planning%20Manual%20full%20document.pdf>.
- 201 Note 125, *supra*.
- 202 Note 20, *supra*.
- 203 The Plan is available at <http://www.biodiv.org/reports/list.aspx?type=all&alpha=L>.
- 204 These goals include:
- (1) To take appropriate measures to protect critical ecosystems against harmful effects or destructive practices for conservation of biological diversity;
 - (2) To create biodiversity awareness among sectors of the society and promote international cooperation;
 - (3) To commit the people to the sound and sustainable use of biological diversity to bring about socioeconomic development;

- (4) To promote rational utilization and conservation of biological diversity;
- (5) To promote access to genetic resources and the fair and equitable sharing of benefits arising from their utilization;
- (6) To contribute to the fulfillment of the millennium development goals (MDGs) through poverty alleviation, food security and gender empowerment in biodiversity by 2015. p. 90-95.

- 205 Section 9.12(a) of the 2006 Forestry Law already directs FDA to conduct wildlife surveys.
- 206 See Model State Biodiversity Conservation Plan in the American Planning Association's Growing Smart Legislative Guidebook (Meck, ed. 2002), Vol. 1, at 4-51, 4-52.
- 207 *Id.*
- 208 For more information on land-use planning and biodiversity, see Defenders of Wildlife, *Integrating Land Use Planning and Biodiversity*, available at http://www.biodiversitypartners.org/pubs/landuse/Landuse_report.pdf.
- 209 See GreenFacts, Scientific Facts on Biodiversity, available at <http://www.greenfacts.org/biodiversity/>.
- 210 See UNEP Desk Study, *supra* note 2, at 47 (discussing need for comprehensive national land-use plan to balance concerns of forest management with those of other sectors); Report on Rapid Faunal Surveys; *supra* note 37, at 18 (explaining that Liberia needs a land-use policy to manage the serious threats to conservation posed by mining activities).
- 211 See Executive Order, *supra* note 43, at ¶ 7.
- 212 *E.g.*, Tyler Christie, Conservation International, personal communication with Environmental Law Institute, May 29, 2006.
- 213 Note 20, *supra*.
- 214 Note 18, *supra*.
- 215 Note 125, *supra*.
- 216 Note 158, *supra*.
- 217 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage, Nov. 16, 1972, 27 U.S.T. 37, 1037 U.N.T.S. 151 (entered into force Dec. 17, 1975) (hereafter "World Heritage Convention").
- 218 Section 3 of the Environment Protection and Management Law defines "person" as "any individual, partnership, joint venture, association, or cooperation, trust, estate, government or state, branch, division, instrumentality, authority or agency or any organized group of persons whether incorporated or not."
- 219 Sections 101(2) and (4) contains two nearly identical provisions stating that persons seeking information must apply via a prescribed form indicating the information sought, except that subsection (2) states that a "minimal" fee may be charged, while subsection (4) states that a "minimal or reasonable" fee shall apply.

- 220 See Consultant's Report, *supra* note 85, at 8.
- 221 Rio Declaration on Environment and Development, *available at* <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163>.
- 222 For example, the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (June 1998) ("Aarhus Convention"), which governs UNECE countries, defines "environmental information" as "any information in written, visual, aural, electronic or any other material form on:
- (a) The state of elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites, biological diversity and its components, including genetically modified organisms, and the interaction among these elements;
 - (b) Factors, such as substances, energy, noise and radiation, and activities or measures, including administrative measures, environmental agreements, policies, legislation, plans and programmes, affecting or likely to affect the elements of the environment within the scope of subparagraph (a) above, and cost-benefit and other economic analyses and assumptions used in environmental decision-making;
 - (c) The state of human health and safety, conditions of human life, cultural sites and built structures, inasmuch as they are or may be affected by the state of the elements of the environment or, through these elements, by the factors, activities or measures referred to in subparagraph (b) above."
- See Convention text at <http://www.unece.org/env/pp/documents/cep43e.pdf>.
- 223 Such agencies include, among others, the Forestry Development Authority, Environmental Protection Agency, Ministry of Agriculture, Ministry of Lands, Mines, and Energy, Ministry of Planning & Economic Affairs, Ministry of Commerce & Industry, Ministry of Transport, Ministry of Public Works, and the Ministry of Health.
- 224 Apart from the fee waiver issue, as a general matter, persons requesting information should not be asked to state a reason for their request.
- 225 Aarhus Convention, *supra* note 222.
- 226 See Sections 7, 8(2), 11, 17-23 of the 2003 Environment Protection and Management Law.
- 227 As discussed in note 5, *supra*, this assessment will not directly analyze the institutional capacity of the Environmental Protection Agency.
- 228 See 2005 U.S. Forest Service Report, Appendix X, *supra* note 22, at 1 (stressing the importance of enforcement and full implementation of biodiversity laws in Liberia, rather than the sufficiency or adequacy of these laws).
- 229 See Dahn Report, *supra* note 29, at 1.
- 230 Except where otherwise cited, the descriptions of these entities are all taken from the National Biodiversity Strategy and Action Plan, *supra* note 2, at 63-65.
- 231 See Vohiri Study, *supra* note 6, at Section 8.2.
- 232 Information about these organizations was drawn from the UNEP Desk Study, *supra* note 2, at 76-77, and the National Biodiversity Strategy and Action Plan, *supra* note 2, at 65-69.

- 233 See <http://www.sdiliberia.org>.
- 234 See <http://www.greenadvocates.org>.
- 235 See <http://www.fauna-flora.org/>.
- 236 Between 2001 and 2004, the Liberia Forest Reassessment Project worked to develop information, tools, and policy for sustainable forest and biodiversity management in Liberia. Its activities during this time included the compilation of a GIS map of Liberia's tropical forest and training of local staff to use GIS equipment; an analysis of Liberia's protected forest area laws and regulations (see Vohiri Study, *supra* note 6); help in drafting and passing three laws regarding protection and use of forest areas; surveys of fauna and botanical species; a workshop on forest management; and a pilot scheme to establish communal forest areas.
See http://www.cepf.net/ImageCache/cepf/content/pdfs/final_2eliberia_2eforest_2ere_5fassessment_2epdf/v1/final.liberia.forest.re_5fassessment.pdf for more information.
- 237 See <http://www.conservation.org>.
- 238 See <http://www.efasl.org.uk/index.htm>.
- 239 See <http://www.fao.org/forestry/site/ffi>.
- 240 National Biodiversity Strategy and Action Plan, *supra* note 2, at 63.
- 241 Budowski, G., 1974. Scientific imperialism. *Unasylva* 27, 24-30.
- 242 Moses D. Wongbeh Sr., Manager, Community Forestry, FDA, personal communication with Paul Jarvan (May 30, 2006) (hereafter "Wongbeh Interview"); Augustsu B.G. Fahnbulleh, Coordinator, National Quarantine and Environmental Service Department of Technical Services, Ministry of Agriculture, personal communication with Paul Jarvan (hereafter "Fahnbulleh Interview"); Lemuel Brown, Director, Environmental Planning Division, Ministry of Planning and Economic Affairs, personal communication with Paul Jarvan (June 12, 2006) (hereafter "Brown Interview"); Anthony D. Kpadeh, Head, Hydro Meteorological Section, Ministry of Lands, Mines, and Energy, personal communication with Paul Jarvan (June 9, 2006) (hereafter "Kpadeh Interview").
- 243 Wongbeh Interview.
- 244 Brown Interview.
- 245 Fahnbulleh Interview.
- 246 Kpadeh Interview.
- 247 Joseph N. Toah, Acting Head, Division of Wildlife, National Parks, and Recreation, FDA, personal communication with Paul Jarvan (May 30, 2006) (hereafter "Toah Interview"); Fahnbullah Interview.
- 248 Wongbeh Interview.
- 249 Brown Interview.
- 250 Kpadeh Interview.
- 251 Fahnbulleh Interview.

- 252 Liberia's National Biodiversity Strategy and Action Plan, *supra* note 2 at 63, also identifies inadequately trained and poorly placed personnel as a common institutional constraint. The Plan explains that this results from weak incentives for graduates (e.g., low salaries, lack of housing, and limited employment possibilities), interruption in schooling caused by the civil conflict, economic migration and "brain drain," and the lack of appropriate biodiversity curricula at existing institutions. *Id.* at 84.
- 253 Theophilus V. Freeman, Technical Manager for Conservation, FDA, Personal Communication with Paul Jarvan (June 14, 2006 hereafter "Freeman Interview"); Toah Interview; Wongbeh Interview; Fahnbulleh Interview. For more information about training needs within the Ministry of Agriculture's National Quarantine and Environmental Services, see text under Trade in Species, Section 3, *supra*.
- 254 Brown Interview.
- 255 Wildlife Conservation Issue Paper, *supra* note 48.
- 256 *Id.* at 50-51.
- 257 U.S. Forest Service Report, *supra* note 22, at 4.
- 258 Fahnbullah Interview.
- 259 Toah Interview.
- 260 Freeman Interview.
- 261 *Id.*
- 262 Emmanuel D. Washington, Ecotourism Officer & Park Ranger, FDA, personal communication with Paul Jarvan (June 12, 2006) (hereafter "Washington Interview").
- 263 Dahn Report, *supra* note 29, at II(3)(c).
- 264 See, e.g., Wildlife Conservation Issue Paper, *supra* note 48, at 41, 44 (FDA lacks vehicles and funds to control conservation areas; adequate office space; and camping and research facilities (e.g., tents, canvas beds, binoculars and cameras) for research and patrol activities); U.S. Forest Service Report, *supra* note 22, at 2, 4 (logistical support also needed for regional wildlife officers and staff, including a means of transportation, communications, and an operational plan). The Forest Service report also stresses the need for wildlife enforcement both within and outside protected areas. *Id.*
- 265 Freeman Interview (stating that individuals who violate the laws governing Sapo National Park are apprehended and taken to a "court of competent jurisdiction," which removes the matter from the jurisdiction of the FDA).
- 266 Consultant's Report, *supra* note 85, at 10-11.
- 267 Report on Rapid Faunal Surveys, *supra* note 37, at 4, 18.
- 268 Fahnbullah Interview.
- 269 Washington Interview.
- 270 Toah Interview.

- 271 Brown Interview.
- 272 Kpadeh Interview.
- 273 Brown Interview.
- 274 Toah Interview.
- 275 Fahnbullah Interview.
- 276 Consultant's report, *supra* note 85, at 11 (noting conflicts in legal authority between FDA, the Ministry of Agriculture, the Ministry of Internal Affairs, and the Ministry of Lands, Mines, and Energy).
- 277 *Id.* at 12 (noting jurisdictional conflicts between the Ministry of Lands, Mines, and Energy, the Ministry of Rural Development, the Ministry of Health and Social Welfare, and the Liberian Water & Sewer Corporation).
- 278 *Id.* (questioning whether the Ministry of Agriculture or the FDA has jurisdiction over sea turtles, sharks, and dolphins).
- 279 *Id.* at 14 (observing that most agencies enact laws and regulations without consulting with other agencies that possess overlapping mandates).
- 280 Toah Interview.
- 281 Fahnbullah Interview.
- 282 Wongbeh Interview.
- 283 Fahnbullah Interview.
- 284 Brown Interview.
- 285 For more information about the importance of international support for FDA's activities, see Critical Ecosystem Partnership Fund, "New Funds Herald New Era for Liberia's Sapo National Park," at http://www.cepf.net/xp/cepf/news/newsletter/2005/december_topstory.xml.
- 286 For more information about forest conservation funds, see Kenneth L. Rosenbaum and Jonathan M. Lindsay, "An Overview of National Forest Funds: Current Approaches and Future Opportunities," *available at* http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/003/x6821e/x6821e00.htm.
- 287 Except where otherwise cited, the information in these profiles has been drawn from the interviews conducted by Paul Jarvan in Liberia, as described in notes 243, 248, 254, and 263, *supra*.
- 288 1976 FDA Act, *supra* note 7, at Section 3.
- 289 The Honorable John Woods, FDA Managing Director, electronic communication with ELI (Sept. 17, 2006). It should be noted that the organizational structure presented here differs from the FDA divisions and departments discussed below, based on the interviews conducted by Mr. Jarvan. This may be due, in part, to structural and staffing changes currently under way at FDA.
- 290 Note 88, *supra*.
- 291 UNEP Desk Study, *supra* note 2, at 71.

Further information

*Further technical information may be obtained from
the UNEP Post-Conflict and Disaster Management Branch website:
<http://postconflict.unep.ch/>*

