Outgoing Liberian government passes forest protection laws

On 11 October, just days before the main rebel groups took their seats beside the former Liberian government and Liberian civil society in a 2-year interim government, outgoing Liberian President, Moses Blah, signed three laws aimed at protecting Liberia's forests from deforestation, fragmentation and degradation. The laws – the Protected Forest Area Network Law, the Sapo National Park Act and the Nimba Nature Reserve Act – come into force when printed as handbills and signify a major step forward in nature conservation legislation for Liberia. Until very recently, the country was engaged in a horrific conflict between forces loyal to then-President Charles Taylor and two rebel groups: Liberians United for Reconciliation and Democracy and the Movement for Democracy in Liberia.

Preparation of the laws was led by Fauna & Flora International with technical input from numerous Liberian and international partners, and financial support principally from the European Commission, the Critical Ecosystem Partnership Fund and the Panton Trust. Liberia contains two of the three remaining large blocks of Upper Guinean rainforest: the Lofa-Gola-Mano block in the north-west, contiguous with Sierra Leone, and the south-east Liberian block that extends into Taï National Park of Côte d'Ivoire.

The Upper Guinean rainforest is a coastal rainforest belt covering six countries from western Togo to eastern Sierra Leone. Today over 40% of the original Upper Guinean forest cover survives in Liberia. This forest is exceptionally diverse biologically, with high rates of endemism and other species that are nearly extinct outside the country. Liberia harbours large primate populations, including the Diana monkey, the red colobus and the western chimpanzee. A survey of the forests of the middle Cestos and Senkwehn rivers in early 1999 found dozens of threatened bird species, some thought extinct or whose range had not been established before in Liberia. The recently passed laws provide a framework in which efforts to conserve species such as these can be undertaken.

The first of the laws amends the New National Forestry Act of 2000. It defines a series of eight protected area types and the uses permitted and prohibited for each, establishing for the first time order and coherency in a previously incoherent legal situation. The second Act expands Sapo National Park – Liberia's only fully protected area, created in 1983 – from 107,300 to 161,40 ha, an increase of 50%. Biological surveys since 2001 have demonstrated that Sapo Park is among West Africa's least disturbed lowland rainforest areas, with populations of free-ranging forest elephants, tool-using chimpanzees, pygmy hippos and other species whose West African ranges have been severely reduced outside Liberia. Botanists who visited the Park in late 2002 found six species new to science in just 10 days (see *Oryx*, 37, 279–284). The third Act creates the Nimba Nature Reserve (*c.* 13,500 ha) out of the former Nimba East National Forest. This mountainous reserve is contiguous with the Nimba Nature Reserves of Guinea and Côte d'Ivoire, which together were declared a Natural World Heritage Site by UNESCO in 1981. Taken together the three reserves cover over 31,000 ha and provide protection to one of the greatest concentrations of plant and animal species on the African continent, including many species found nowhere outside the Nimba Mountains.

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The impact of traditional Chinese medicine on threatened species

The continuing use by traditional Chinese medicine of the products of threatened animals and plants is having a serious impact on the long-term survival of many species. CITES has documented heavy usage of animal parts in traditional medicines, and traditional Chinese medicine is one of the most high profile medicines in this respect. Approximately 900 animal species have been used in such Chinese medicine, of which *c.* 60 are commonly used, principally by Asian communities (Han, L., 1992, *A glossary of Chinese-Latin-English Names in Animal Medicine Materials*. Fujian Science & Technology Press, Fuzhou, China). Amongst the 42 animal species that in 1995 were banned from domestic markets by the State Traditional Chinese Medicine Administration Bureau and the Ministry of Public Health in China are the horns of three species of rhinoceros, bones and skin

of tiger *Panthera tigris*, leopard *P. pardus* and snow leopard *Uncia uncia*, the musk, horns, tail and penis of three species of musk deer (*Moschus* spp.), the scales of all seven species of pangolins (*Manis* spp.), the antlers, velvet and horns of a number of species of deer and antelope, the carapace of three species of turtle, the testes and penis of all species of seals, and dried seahorse *Hippocampus kelloggi*. Wild plants at risk through their use in traditional Chinese medicine include five *Dendrobium* spp., *Rhizoma bletilla striata, Gastrodia elata, Cibotium barometz, Radiz panax, Aloe ferox, Podophyllum emodi* and *Saussurea lappa*.

However, recent reports by organizations such as TRAFFIC indicate that illegal trade in these species continues, and is driving the decline of the species. The numbers of all species of rhino have fallen dramatically, even though it has become widely accepted that the keratin of rhino horn has no aphrodisiac or erectile properties. The horn does contain high amounts of the free amino acid arginine, which is said to act as an aphrodisiac. Rhino horn also has a variety of other pharmacological properties, e.g. as a component of a decoction of rhino horn mixed with herbs that has been shown (But, P.P., Tam, Y.K. & Lung, L.C. (1991) Anti-pyretic effects of prescriptions containing rhinoceros horn or water buffalo horn. *Journal of Ethnopharmacology*, 33, 45–50.) to possess significant anti-pyretic action. In this respect water buffalo *Bubalus bubalis* horn can be successfully substituted for rhino horn, as can the horns of several other species including those of domestic cattle *Bos taurus* and, before it became threatened (see *Oryx*, 36, 323), the saiga *Saiga tatarica*.

Amongst the other species used in traditional Chinese medicine, tiger numbers have crashed, driven by the trade in their bones and skin, and all surviving subspecies are on CITES Appendix I (banning all international trade in their products). Threatened Asiatic black bears *Selenarctos thibetanus* are widely farmed for their bile in China, where they are also removed from the wild for captive breeding for their gall bladders. However, the use of bear bile in China is limited, most being exported to Japan, South Korea, Australia, North America, Indonesia, Malaysia, Singapore and Taiwan. Under CITES, the international trade in bile and gall bladders from Chinese bear farms is already illegal, but such trade continues nonetheless. By demonstrating the existence of effective synthetic and herbal alternatives for use in traditional Chinese medicine, attempts are now being made by Middlesex University and such animal welfare organizations as the World Society for the Protection of Animals and the International Fund for Animal Welfare to convince the Chinese government that it is preferable for it to close down the numerous bear farms in China rather than attract increasing international opprobrium.

Populations of threatened animals and plants will continue to decline, and biodiversity will inevitably be lost, if traditional medicines, including that of China, continue to plunder some of the world's most threatened animals and plants. The facts are shocking: the £5 billion illegal trade in animal parts and plants worldwide (much of it for use in traditional Chinese medicine) is second only in value to that of the international drugs trade (Dr Henry Lee, personal communication). In 2000 a total of 52,000 illegal wildlife products were seized in seaports and airports in Britain alone. A major problem in trying to wean people away from the use of traditional medicines containing the parts of threatened animals and plants to those containing synthetic substitutes and non-threatened plants is convincing them that the latter are as efficacious as the tried and tested former, some of which have been in use for thousands of years.

The Chinese Medicine Association of Suppliers (CMAS), which was formed in 1998 to represent and regulate traditional Chinese medicine in the UK and is recognized and supported by the State Administration of Traditional Chinese Medicine in Beijing and by the Medicines Control Agency in the UK, attaches great importance to the concerns of conservation organizations in promoting the protection of threatened species. CMAS requires producers, exporters and importers to comply with the demands of CITES, and is also concerned with the replacement in traditional Chinese medicine of threatened animals and plants by plant species that are not threatened. Attempts are being made to persuade practitioners and patients to use products of equal efficacy that are extracted from non-threatened plant species. In 2000 the European Centre for Traditional Chinese Medicine at Middlesex University, UK, received funding from the British government and other sources to find plant substitutes for rhinoceros horns, tiger bones and skin, and bear gall bladders and bile. One of the ways by which it is hoped that this will be achieved is the widespread cultivation of the 12 plant species listed above; a pilot experimental project has already begun on an organic hill farm in Guangdon Province, China. Identification and classification of the active chemical components of these threatened plants should help to find non-threatened plants with similar attributes.

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Transboundary water issues threaten the Serengeti ecosystem

The 25,000 km^2 Serengeti ecosystem of Tanzania and Kenya includes a National Park, game reserves, game controlled areas, Ngorongoro Conservation Area and the

https://doi.org/10.1017/S0030605304000031 Published online by Cambridge University Press

Masai-Mara Game Reserve. At the centre of the ecosystem is Tanzania's 14,763 km^2 Serengeti National Park. The Mara, Grumeti and Mbalageti Rivers, all of which flow westward to Lake Victoria, drain the Park, which is listed as a UNESCO World Heritage Site and is made spectacular by the annual migration of more than 1 million wildebeest and over 200,000 zebras. These animals disperse into the treeless southern grasslands of the Park and the western region of the Ngorongoro Conservation Area, the driest region of the Park, during the rainy season (December–April). At the end of this season the animals migrate towards the lower Grumeti River and thence to the northern region of the Serengeti National Park and the Masai-Mara Reserve in Kenya, where they take refuge during the dry season. The Mara River, which originates from Kenya, is the only reliable source of water for this area.

The proposed Ewaso Ngiro (South) Hydropower project in Kenya would divert water from the Amala River in the Mara River catchment into another catchment, the Ewaso Ngiro River, where the water would be used to generate an average of 180 MW of hydroelectricity using a three dam cascade (Oletukat, Leshota and Oldorko). The water diversion rate would vary with the water discharge, peaking at 6 m^3 s^{-1} during high flows. The engineering feasibility report argued that for a typical year the project would not modify the mean discharge of the Mara River, and therefore the project would never affect the Serengeti Ecosystem.

However, this prediction is flawed. Firstly, it does not include a prediction of the availability of water in the Mara River during a drought, as the data used spanned years when no severe drought occurred. Secondly, the study did not adequately calculate the availability of water in the Mara River as it flows through the Serengeti ecosystem, because the study neglected the impact of deforestation and irrigation in Kenya. Finally, the study did not include the additional impact on the availability of water resulting from future climate change.

An ecohydrology model has now been used to assess the likely impact on the Serengeti ecosystem of deforestation, irrigation, the proposed hydroelectric project and climatic change. The model predicts that the Serengeti ecosystem would be severely affected during a drought, with a severe impact on the number of migrating wildebeest. According to the severity and duration of any drought the model predicts that 20–80% of the migrating wildebeest would die. With a 50% die-off, it could take 20 years for the wildebeest population to recover.

It has therefore been suggested that a Mara River Transboundary Management Plan needs to be drawn up, in which the governments of Kenya and Tanzania have equal voices, as they both have much to lose if the ecosystem of the Mara River is damaged. Such a management plan will need to be compatible with ecohydrology principles for the sustainable use of transboundary water resources by both countries.

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New and improved internet resources

The Evolution of the Conservation Movement, 1850–1920 (http://memory.loc.gov/ammem/amrvhtml/conshome.html) documents the historical formation and cultural foundations of the movement to conserve and protect America's natural heritage, through books, pamphlets, government documents, manuscripts, prints, photographs and motion picture footage drawn from the collections of the Library of Congress. The development of a conservation ethic in the United States was a process that displayed a great deal of heterogeneity, and to a certain extent, a good deal of contentious debate about what could be done to conserve natural resources and landscapes throughout the country. Some of the phenomena that manifested themselves during this period included a perceived crisis in American national identity and purpose, expressions of anti-urbanism, and the growth of travel literature. All of these subjects and more are explored within this documentary archive of materials developed by the American Memory group at the Library of Congress. In total the archive contains 62 books and pamphlets, 140 Federal statutes and Congressional resolutions, various Presidential proclamations, 170 prints and photographs, and two motion pictures.

The Global Seabird Conservation Programme (http://www.savethealbatross.org.za), a project of BirdLife International, is focused on the impact of longline fisheries on seabird, albatross and petrel species in particular. The Programme's web site offers detailed information about the project, the latest related news, and a database on the interactions of threatened seabirds and longline fisheries. The database provides threatened seabird species accounts, seabird bycatch reports and related information.

World Chelonian Trust (http://www.chelonia.org) supports field studies, veterinary research, and conservation projects worldwide that promote the conservation of all tortoises and freshwater turtles species. Additionally, the Trust provides information and guidance to individuals and organizations to further the successful maintenance and propagation of captive populations. Much of this information and guidance is made available through the web site, including an extensive collection of articles, a photo gallery and other relevant resources.

The Information Center for the Environment (ICE) Biological Inventories Databases (http://www.ice.ucdavis.edu/mab) is a cooperative effort between scientists at University of California and collaborators from over 30 organizations involved in environmental protection. The databases contain documented, taxonomically standardized species inventories of plants and animals reported from the world's protected areas. These online databases have been updated recently to include botanical inventories from protected areas in Costa Rica and South Africa.

The Convention on Biological Diversity (http://www.biodiv.org), convened after the 1992 Earth Summit in Rio de Janeiro, has three primary goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. The main body of the organization's home page is dedicated to disseminating information about upcoming meetings, news and events. A large number of documents are available, divided into groups that include quarterly reports, global biodiversity outlook reports, and case-study documents.

https://doi.org/10.1017/S0030605304000031 Published online by Cambridge University Press