WEST AFRICA BIODIVERSITY AND CLIMATE CHANGE (WA BICC)

Conserving and Connecting the Ziama-Wonegizi-Wologizi Transboundary Forest Landscape between Guinea and Liberia

Final Report (April 2018–June 2020)

By Fauna & Flora International (FFI)

SEPTEMBER 2020

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This report was prepared by:
Fauna & Flora International
Liberia: #2 Johnson Compound
Old Congo Town
Monrovia, Liberia
Mary Molokwu-Odozi, Country Manager (mary.molokwu@fauna-flora.org)

United Kingdom: The David Attenborough Building
Pembroke Street, Cambridge, CB2 3QZ
Angelique Todd, Senior Programme Manager, West & Central Africa (angelique.todd@fauna-flora.org

Tetra Tech Contacts:
Stephen Kelleher, Chief of Party (Stephen.Kelleher@tetratech.com)
Vaneska Litz, Project Manager (Vaneska.Litz@tetratech.com)
Ed Harvey, Deputy Project Manager (Ed.Harvey@tetratech.com)

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Photo: Aerial view of the Ziama-Wonegizi-Wologizi Transboundary Forest landscape. Photo credit: FFI.

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ACRONYMS

APLORI	A. P. Leventis Ornithological Institute
BID	Biodiversity Information for Development
CA	Conservation Agriculture
CBCGC	Capacity Building Conference for Conservation, Global Conference, UK
CCZ	Core Conservation Zone
CEPF	Critical Ecosystem Partnership Fund
CFZ	Centre Forestière de N'Zerekore, Guinee
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EDGE	Evolutionarily Distinct and Globally Endangered Species
eDNA	Environmental DNA
ELRECO	Elephant Research and Conservation
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
EU	European Union
FDA	Forestry Development Authority
FFI	Fauna & Flora International
FFS	Farmer Field School
FMC	Forest Management Committee
FPIC	Free, Prior and Informed Consent
GRNP	Gola Rainforest National Park
HCV	High Conservation Value
HPA	Heritage Partners & Associates
HWC	Human Wildlife Conflict
IBA	Important Bird Area
IDBD	International Day for Biological Diversity
IDF	International Day of Forests
IP	Implementation Plan
IPM	Integrated Pest Management
IRAG	Institute de Recherche Agronomique de Guinee
IUCN	International Union for Conservation of Nature
IWT	Illegal Wildlife Trade
LCCC	Lofa County Community College

LCRP	Liberia Chimpanzee Rescue and Protection
LESC	Law Enforcement Sub-Committee
LFSP	Liberia Forest Sector Project
LLA	Landscape Level Assessment
LNP	Liberia National Police
LRA	Land Rights Act
MAB	Man and Biosphere
MEEF	Ministère de l'Environnment, des Eaux et des Forêts, Guinee
MOJ	Ministry of Justice, Liberia
MoU	Memorandum of Understanding
MRU	Mano River Union
NACSO	Namibian Association of CBNRM Support Organizations
NFI	National Forest Inventory
NGO	Non-Governmental Organization
NORAD	Norwegian Agency for Development Cooperation
NTFP	Non-Timber Forest Product
ODK	Open Data Kit
OIPR	Office Ivorien des Parcs et Reserves
PA	Protected Area
PASC	Plant and Animal Sub-Committee
PH	Pygmy Hippopotamus
PMSD	Participatory Market System Development
PPA	Proposed Protected Area
PPT	PowerPoint
RAP	Rapid Assessment Program
REDD	Reducing Emissions from Deforestation and Forest Degradation
RIU	REDD+ Implementation Unit
SADS	Skills and Agricultural Development Services, Liberia
SCNL	Society for the Conservation of Nature of Liberia
SDI	Sustainable Development Institute
SMART	Spatial Monitoring and Reporting Tool
SOP	Standard Operating Procedures
SWGL	Species Working Group, Liberia
TGKS	Tai-Grebo-Krahn-Sapo

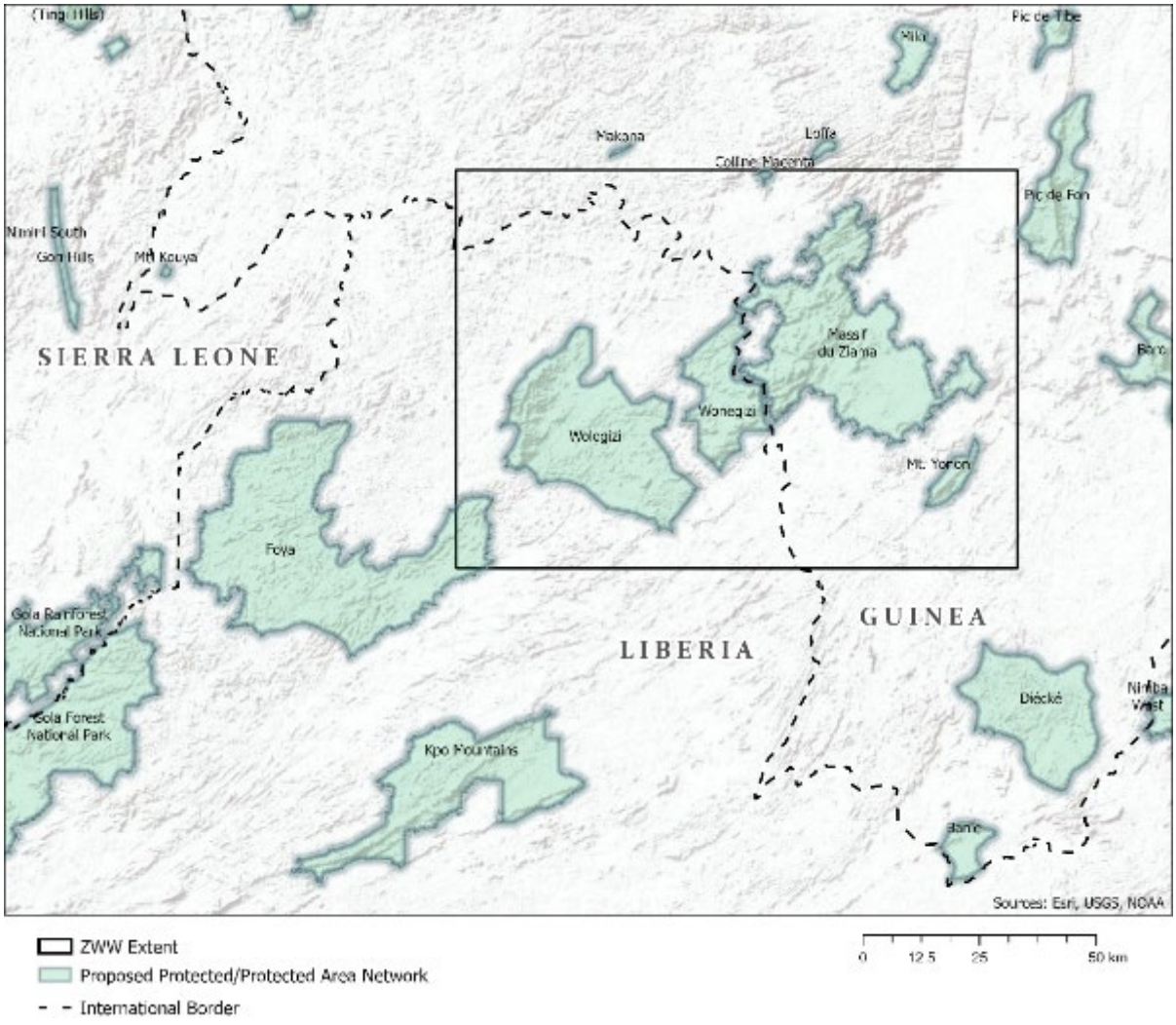
ToR	Terms of Reference
TOT	Training of Trainers
UFHB	Universite Felix Houphouet Boigny
UL	University of Liberia
UNESCO	United Nations Education, Scientific and Cultural Organization
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
VSLA	Village Savings and Loan Association
WA BiCC	West Africa Biodiversity and Climate Change Program
WCF	Wild Chimpanzee Foundation
WPPA	Wonegizi Proposed Protected Area
ZWW	Ziama-Wonegizi-Wologizi
ZWWF	Ziama-Wonegizi-Wologizi-Foya

EXECUTIVE SUMMARY

In 2018, Fauna & Flora International (FFI) secured a grant from the United States Agency for International Development's (USAID) West Africa Biodiversity and Climate Change (WA BiCC) program to promote innovative collaborative management of the Ziama-Wonegizi-Wologizi (ZWW) Transboundary Forest Landscape between Liberia and Guinea. The aim of the project is to strengthen forest conservation, protect biodiversity, ensure connectivity between sites, enhance forest governance and improve the livelihood of people in the landscape.

The ZWW forest landscape comprises the Wonegizi proposed protected area (WPPA) in Liberia, which is 2 km from the Wologizi forest block (also a PPA) and contiguous with the Massif du Ziama Man and Biosphere (MAB) Reserve in Guinea (Barca, 2018).

Figure 1. Map of the Ziama-Wonegizi-Wologizi landscape (S. Gregory, 2019)



Significant achievements of the project include:

- First camera trap survey in Wologizi, 10 rapid biodiversity assessments conducted across the landscape and high conservation value (HCV) surveys completed in Wonegizi (co-funded by the Norwegian Agency for Development Cooperation [NORAD]);
- Training courses on the following subjects: ecological sampling, general biomonitoring, pygmy hippo survey methodology, environmental DNA (eDNA) methods, law enforcement, camera

trap methodology, basic statistics, ArcGIS, participatory market system development (PMSD) training of trainer (TOT), computer skills (co-funded by NORAD) and wildlife law training;

- Establishment of three farmer field schools (FFS) in Ziama, with 75 direct and 800 indirect beneficiaries;
- Establishment of regular biomonitoring and law enforcement in Wonegizi, and continued biomonitoring (including camera trapping and elephant monitoring) and law enforcement patrols in Ziama;
- Completed landscape level assessment (LLA);
- FFI hosted the Regional Species Action Planning Workshop for the Pygmy Hippopotamus, supported the National Chimpanzee Action Planning Workshop and the National Strategy Development Workshop for Combatting Wildlife Crime. Meetings of important networks such as the species working group (SWG) and sub-committee meetings continued;
- Support for the development of the Massif du Ziama MAB Reserve Revised Management Plan, which was officially adopted in October 2019;
- Development, validation and signing of a bilateral framework agreement and operational memorandum of understanding (MoU) between Guinea and Liberia (October 24, 2019) for the conservation and sustainable management of the ZWW landscape. Also, development of a terms of reference (ToR) for the ZWW Transboundary Landscape Steering Committee;
- Conducted three transboundary conservation study tours and four FFS learning exchange visits; and
- Implementation of a suite of awareness activities as part of an overall behavior change communications strategy, including: support for national awareness days, production of awareness materials, stakeholder presentations and community mobilization events.

Recommendations for future activities include:

- Conduct additional surveys in the landscape (e.g., high-altitude surveys in Ziama, small mammals and butterflies in Wonegizi and wet season surveys);
- Conduct a reducing emissions from deforestation and forest degradation (REDD+) feasibility assessment for Ziama and Wologizi with the aim of achieving REDD benefits at a landscape scale;
- Secure and protect migration corridors across the ZWW landscape;
- Support the gazettement of Wologizi as a protected area (PA), implementation of the Ziama management plan and continue support for the protection of Wonegizi, ensuring Wonegizi is gazetted and attains full protection status;
- Support the development and implementation of a Wonegizi management plan;
- Support implementation of ZWW transboundary management in line with the bilateral framework agreement, operational MoU and steering committee ToRs;
- Implement activities to combat wildlife crime in line with the national strategy, including but not limited to establishing local and national intelligence networks, adoption of effective detection tools and techniques and continued support for strengthening intra-agency collaboration (e.g., Forestry Development Authority [FDA] and Ministry of Justice [MOJ] MoU);
- Increase financial support for wildlife sanctuaries as part of supporting effective law enforcement;

- Recognition that wildlife sanctuaries play a much wider role as implementing partners within law enforcement, awareness raising and livelihood;
- Continue and expand FFSs and pilot initiatives to reduce human wildlife conflict (HWC) (as per the recommendations made by Elephant Research and Conservation [ELRECO]);
- Implement a behavior change communications strategy regarding ecosystem services, protected species, wildlife law, threats to biodiversity, sustainable non-timber forest product (NTFP) collection and impacts of climate change;
- Engage ecotourism specialists to implement ecotourism projects as per the recommendations in the recent assessment commissioned by the FDA under the Liberia Forest Sector Project (LFSP);
- Continue football matches as an awareness-raising tool; and publish regular conservation articles in the press.

1.0 PROJECT JUSTIFICATION AND OBJECTIVES

The Ziama-Wonegizi-Wologizi (ZWW) Transboundary Forest Landscape holds some of the largest remnant, relic forests within the Upper Guinean forest ecosystem, a widely recognized global biodiversity hotspot home to more than 25% of Africa's mammals (Myers et al., 2000). The 119,019 hectare (ha) Massif du Ziama Man and Biosphere (MAB) Reserve in Guinea, the 28,868 ha Wonegizi Mountains and the 167,985 ha Wologizi Mountains in Liberia are each noted as key biodiversity areas within the Upper Guinean forest ecosystem, possessing high levels of species richness and endemism of both fauna and flora, including the critically endangered Western chimpanzee (*Pan troglodytes*) and vulnerable African elephant (*Loxodonta africana*). Both species serve as flagships for this landscape, and for forest elephants in particular, ZWW represents one of their last viable, intact habitats in West Africa.

Like much of the Upper Guinean forest system, the Ziama-Wonegizi-Wologizi-Foya (ZWWF) landscape and its biodiversity are threatened by forest degradation and habitat loss due primarily to agricultural encroachment and expansion for subsistence and, to a lesser extent, commercial interests. Most subsistence farmers in the landscape utilize harmful slash-and-burn farming techniques, are extremely poor and rarely find and access other livelihood alternatives outside of farming. Rising food insecurity and the 2014 Ebola outbreak have increased pressure on these already poor and remote households.

Due to people and wildlife's close intersection in this landscape, human wildlife conflict (HWC) and the threat of zoonotic disease are chronic issues. HWC results in the loss of crops, food and income for people, and retaliations by humans against wildlife can lead to injury or death for animals, including elephants, and destroyed forest resources, particularly in and near important buffer zone areas. Fauna & Flora International (FFI) and its partners have seen where successful conservation has led to increased wildlife populations, which may be correlated to increased HWC in some areas. The potentially cyclical nature of effective conservation and HWC poses an important practical challenge in ZWW. Meanwhile, the recent devastating Ebola outbreak and now COVID-19 are forceful shows of the risk posed by failing to mitigate against disease transmission.

Other secondary threats to the landscape include: commercial logging, which was active until very recently in Guinea and may be reintroduced if the logging industry's lobbying efforts prove successful; commercial mining in Wonegizi, which occurs in a licensed concession that operates without clear demarcations; and intermittent in-migration linked to any type of medium-to-large development project. While neither has materialized to date, oil palm plantations and major road development both exist as potential, significant threats to biodiversity and forest resources in the future.

All of these issues occur against a backdrop of improving but still weak government and local institutions. Guinea's protected areas (PA) benefit from a stronger structure and more on-the-ground ranger capacity, but forthcoming changes to its conservation and management systems at the national level may cause resources to be appropriated away from park and conservation management. Liberia benefits from comparatively stronger institutional capacity at the national level, but its PAs are mostly proposed and regularly experience insufficient ranger capacity, infrastructure gaps and an inability to cover operational costs. Due to the FFI projects that have been in existence for several years, PA staff and local communities in both countries have some knowledge of key PA management and land use planning concepts, such as core conservation areas, community use zones and transitional and buffer zones, but ongoing support is needed to implement, enforce and sustain these concepts for the benefit of biodiversity and local people. Park authorities and non-governmental organization (NGO) conservation partners are also currently navigating through different approaches to develop monetary and/or nonmonetary incentives to encourage local people to support conservation. Liberia has embraced reducing emissions from deforestation and forest

degradation (REDD+), for example, while the authority in Guinea has tried to avoid creating reliance on financial incentives because of concerns over their long-term sustainability, especially in the face of population growth and in-migration. This creates a delicate balancing act of trying to create incentives while not fuelling resentment as word of one incentive scheme reaches communities affected by a different scheme.

Finally, while Liberia and Guinea have a long and important history of collaborating on natural resources management and other economic and development issues, both countries face practical challenges as they endeavor to work together on transboundary initiatives, including language and differing priorities on the part of government.

The project's overall goal is to promote innovative collaborative management of the ZWW Transboundary Forest Landscape between Liberia and Guinea that strengthens forest conservation, protects biodiversity, ensures connectivity between sites, enhances forest governance and improves the livelihood of people in the landscape.

In order to achieve the above, the project delivered the following four objectives:

Objective 1. Strengthen forest and biodiversity conservation of the ZWW Transboundary Forest Landscape.

Objective 2. Support creation of an enabling environment that facilitates forest governance and related law enforcement within the ZWWF landscape.

Objective 3. Promote sustainable livelihood activities that contribute to the improved wellbeing of people within the ZWWF landscape and reduce unsustainable forest dependency while striving to identify sustainable forest management approaches.

Objective 4. Encourage learning and sharing of inspiring knowledge, responsible attitudes and best practices that strengthen local interventions and enhance national or regional policy initiatives. This should include but not be limited to national government and non-governmental partners, the core WA BiCC regional partners, and the MRU and ECOWAS in particular.

2.0 SUMMARY OF PROGRESS

2.1 SUMMARY: Q4/2018–Q2/2020 ACCOMPLISHMENTS

An overall accomplishment was the official launch of the project in Guinea in October 2018, organized by the West Africa Biodiversity and Climate Change Program (WA BiCC), after several months of delay in start up.

2.1.1 OBJECTIVE 1: STRENGTHENING FOREST AND BIODIVERSITY CONSERVATION OF THE ZWW TRANSBOUNDARY FOREST LANDSCAPE.

- Socio-economic and biodiversity baseline information and data gathering completed, including repeat socio-economic surveys in Ziama and Wonegizi respectively; and high conservation value (HCV) surveys—HCV 1–IV (biological/ecological values), V (community needs) and VI (cultural values) mapping completed for Wonegizi (funded by the Norwegian Agency for Development Cooperation [NORAD]);
- Ten rapid biodiversity assessments conducted across the landscape and HCV assessment of the importance/value of cocoa farms to biodiversity, with a focus on birds in the Wonegizi proposed protected area (WPPA);
- Seventeen trainings conducted for staff of the Forestry Development Authority (FDA) and Centre Forestière de N'Zerekore, Guinee (CFZ), community auxiliaries and students in Wonegizi and Ziama, including: ecological sampling, law enforcement, rapid assessment methodologies (large mammals, small mammals, herpetiles and plants), health and safety, general biomonitoring, computer skills (co-funded by NORAD), pygmy hippo survey, camera trapping techniques, environmental DNA (eDNA) sampling, communications, statistical analysis, ArcGIS, ground-truthing for the landscape level assessment (LLA), spatial monitoring and reporting tool (SMART) (funded by the Illegal Wildlife Trade [IWT] grant) and wildlife law training;
- Regular biomonitoring in Wonegizi established and biomonitoring continued (including camera trapping and elephant monitoring) in Ziama;
- First camera trapping survey in Wologizi (two sectors);
- LLA methodology developed and assessment completed;
- Species working group (SWG) and sub-committee meetings held. FFI hosted the Regional Species Action Planning Workshop for the Pygmy Hippopotamus, supported the National Chimpanzee Action Planning Workshop and the National Strategy Development Workshop for Combatting Wildlife Crime;
- Continued support for the development and adoption of the Massif du Ziama MAB Reserve Revised Management Plan; and
- Three transboundary conservation learning exchange visits, including a study tour for policy makers in Liberia to Namibia, CFZ (Guinea) visit to Taï National Park, Côte d'Ivoire, and Wonegizi FDA staff visit to Gola Rainforest National Park (GRNP) in Sierra Leone.

2.1.2 OBJECTIVE 2: SUPPORT CREATION OF AN ENABLING ENVIRONMENT THAT FACILITATES FOREST GOVERNANCE AND RELATED LAW ENFORCEMENT WITHIN THE ZWW LANDSCAPE.

- Development, validation and finalization of a draft bilateral agreement, memorandum of understanding (MoU) and steering committee terms of reference (ToR) for the transboundary management of ZWW;

- Establishment and facilitation of monthly law enforcement and biomonitoring patrols in Wonegizi and continuation of patrols in Ziama;
- Gazettement process for Wonegizi commenced, and draft gazettement protocol under development;
- Stakeholder needs assessment completed for 12 FDA Wonegizi rangers, 57 CFZ Ziama rangers and CFZ management;
- Seventeen training courses delivered (see Objective 1);
- Strengthening of regulations under the revised National Wildlife Conservation and Protected Area Management Law of Liberia and support to the FDA and CFZ to increase understanding and collaboration with enforcement agencies (e.g., police and Ministry of Justice [MOJ]) to address wildlife crime more effectively; and
- Signing of bilateral agreement between the governments of Liberia and Guinea, and validation of the Ziama MAB management plan.

2.1.3 OBJECTIVE 3: PROMOTE SUSTAINABLE LIVELIHOOD ACTIVITIES THAT CONTRIBUTE TO THE IMPROVED WELLBEING OF PEOPLE WITHIN THE ZWW LANDSCAPE AND REDUCE UNSUSTAINABLE FOREST DEPENDENCY WHILE STRIVING TO IDENTIFY SUSTAINABLE FOREST MANAGEMENT APPROACHES.

- One hundred eighty farmers interviewed across three communities to design a curriculum for the farmer field schools (FFS) in Ziama;
- FFSs, market gardens and agro-forestry (coffee) nurseries established in three Ziama communities, with a total of 75 registered members and 800 indirect beneficiaries;
- Three hundred ninety-eight Wonegizi farmers successfully completed and graduated from their FFS training program (NORAD project);
- Participatory market system development (PMSD) training of trainers (TOT) conducted for implementing partners and FFI staff in Liberia and Guinea, and biopesticides training given to farmers in three communities in Ziama; and
- Five internships completed: four PMSD research projects on sustainable production and markets and one research project to assess the impact of PAs on non-timber forest product (NTFP) conservation.

2.1.4 OBJECTIVE 4: ENCOURAGE LEARNING AND SHARING OF INSPIRING KNOWLEDGE, RESPONSIBLE ATTITUDES AND BEST PRACTICES THAT STRENGTHEN LOCAL INTERVENTIONS AND ENHANCE NATIONAL OR REGIONAL POLICY INITIATIVES.

- Les Elephants de Ziama football team established and six football matches played;
- Protected species billboard in Monrovia and murals painted in Monrovia and Gbarnga;
- National-level awareness raising on forests, protected species and the wildlife law held during three events, including the International Day of Forests (IDF), International Day for Biological Diversity (IDBD) and World Chimpanzee Day. Local-level awareness raising in Guinea on elephants held during World Elephant Day 2019;
- Production of a public games show on the consequences of deforestation in Ziama, community engagement on the wildlife and forest codes (32 communities) and the revised Ziama management plan (23 communities); and

- Installation of signboards in and around the Ziama MAB regarding the banning of pesticides in the reserve (10) and depicting protected species (3).

3.0 PROJECT ACCOMPLISHMENTS

3.1 OBJECTIVE 1: STRENGTHEN FOREST AND BIODIVERSITY CONSERVATION OF THE ZIAMA-WONEGIZI-WOLOGIZI TRANSBOUNDARY FOREST LANDSCAPE.

3.1.1 ACTIVITY 1.1: BASELINE INFORMATION AND DATA GATHERING AND SHARING

1.1.1, 1.1.2 and 1.1.5: Stakeholder mapping and HCV V & VI

Activities related to social data in Liberia were initiated by the HCV assessment team through the compilation of existing documentation (part funded by NORAD and supported by Colin Pringle and Rob Small) in 2018. HCV V (community needs) and VI (cultural values) surveys were conducted in Wonegizi as a baseline, along with stakeholder mapping and a capacity needs assessment for the Forest Management Committee (FMC) in Wonegizi (all funded under NORAD). Mapping of HCV V and VI resources were also completed under the NORAD project. Stakeholder mapping and a review of prior stakeholder surveys conducted in Ziama were completed by Alan Deverall (consultant).

1.1.3 and 1.1.4: Baseline biodiversity surveys and protected area management

A biodiversity intern assisted with the research and compilation of existing baseline data on the biodiversity of the ZWW Transboundary Forest Landscape. The deliverables fed directly into the LLA that aimed to identify viable corridors of wildlife migration within the ZWW landscape that strengthen biodiversity conservation activity. Tasks completed by the intern included:

- A literature review on the region (Liberia and Guinea), with a particular focus on the ZWW landscape;
- Collation of all biodiversity-related information (historical and current) and more detailed literature searches; and
- Design and establishment of a biodiversity document database/folder.

3.1.2 ACTIVITY 1.2: CONDUCT SOCIO-ECONOMIC SURVEYS WITHIN THE ZWWF LANDSCAPE

1.2.1: Replicate socio-economic surveys

Repeat socio-economic surveys were conducted in 32 and 13 communities in Ziama and Wonegizi respectively. The survey was designed to gather data about people's way of life in the Wonegizi and Ziama areas in order to inform decision making and planning for the project to support households in the area.

Data was collected using the open data kit (ODK), which is an open source free software that allows surveys using questionnaires to be completed via smartphone or tablet in a standardized manner. Prior to the start of the surveys, meetings were held in all project towns to request permission to carry out the interviews and introduce the data collection device (in this case, a smartphone). Prior to the start of the survey, all enumerators received training and trialed the surveys on the ground.

In Wonegizi, a total of 530 persons were interviewed across 13 project towns, of which 235 were men and 295 were women. We aimed to interview a similar number of men and women per town, however this was not always feasible. In Ziama, 1088 persons were interviewed across 15 project towns, of which 534 were men and 554 were women.

The surveys collected data on people's wellbeing, food security, decision-making power, safety, overall wellbeing, livelihood, income and HWC. Further details can be found in the reports for each site.

3.1.3 ACTIVITY 1.3: BIODIVERSITY ASSESSMENTS AND MONITORING OF THE ZWW LANDSCAPE

1.3.1: Rapid Assessment Program

Rapid assessments completed during the reporting period include:

- Large mammals—Wologizi (large mammals were also surveyed in Wonegizi, funded by NORAD);
- Birds—Wologizi and Ziama;
- Butterflies—Ziama;
- Plants—Ziama;
- Reptiles and amphibians—Wologizi and Ziama; and
- Small mammals—Wologizi and Ziama.

Large mammal survey

It was decided that there was no need for a rapid assessment of large mammals in Ziama, as a survey had already been completed in 2016 and biomonitoring has been ongoing at the site since before this project started.

Dr. Tina Vogt and Bernhard Forster from Elephant Research and Conservation (ELRECO) trained the team members in survey methodology on December 3rd. Participants learned about the general approach of the survey, the species list the survey focused on (large and medium mammals) and the survey methods, including interview surveys, reconnaissance surveys and dung sampling.

Interviews were conducted with hunters in four communities in order to understand past and current large- and medium-sized mammal presence, and to collect general information on distribution, relative abundance and trends. The data from the interviews also helped to guide the selection of sites for the reconnaissance surveys. During the survey, the teams observed direct and indirect signs of large (and where possible, medium) mammals. Elephant and pygmy hippopotamus dung samples were collected for genetic analysis.

The following text is from the report.

In total, 28 mammal species were recorded during the survey, including the forest elephant, 8 primates, 2 carnivores, 14 ungulates and 3 pangolins. Five species were uncertain, including Jentink's duiker, zebra duiker, giant forest hog (which is extinct or very rare in Wologizi today), giant ground pangolin (used to be present, but unlikely now) and the olive colobus (probably present). Fifteen species of global conservation concern were recorded, i.e., listed either as critically endangered (1 species, the Western chimpanzee), endangered (3 species, the red colobus, pygmy hippo and Jentink's duiker) or vulnerable (11 species, the forest elephant, king colobus, olive colobus, Diana monkey, leopard, African golden cat, zebra duiker, Ogilby's duiker, giant ground pangolin, black-bellied pangolin and white-bellied pangolin), while the remaining species are considered near threatened (5 species) or of least concern (8 species) (IUCN, 2018).

Hunting and subsistence farming are the main sources of income for Wologizi communities who are highly dependent on forest resources such as bushmeat, bush pepper, timber, bitter kola, rattan and medicinal plants. Signs of human impact were found in all survey sites.

The large mammal survey showed that Wologizi plays a crucial role in biodiversity conservation in Northern Liberia and the wider region. The PPA displays great topographical diversity, harbors a variety of habitats and

is rich in water resources, including two large rivers as well as smaller streams and swamps. Located between the Wonegizi PPA in the northeast and Foya PPA in the southwest, Wologizi also takes a geographically significant position as a link in the overall connectivity of the northern forest belt. The forest of Wologizi in general was found to still be in good condition, and still keeps rich and diverse large mammal fauna. Especially the central, northern and western parts, i.e., the whole area between the Lawa River and the northwestern boundary of the PPA, notably the catchment areas of the Lawa River and Lofa River, as well as the Wologizi Mountain Range, seem to be an important refuge for a lot of species, including several globally threatened species such as the Western chimpanzee, forest elephant and pygmy hippopotamus. The region south of the Lawa River was found to be less diverse, both in terms of large mammal species diversity and abundance. However, this does not mean that this part of Wologizi is less important for conservation—in contrast, it is regularly traversed by forest elephants on their seasonal migrations, and can serve as an essential buffer zone to shield anthropogenic pressure, for example, from the surrounding populated places as well as the logging activities currently taking place in the forest south/southwest of Wologizi.

The survey also showed that the biodiversity of Wologizi is threatened by human activities, mainly hunting and farming, which currently are not well controlled. The following recommendations are given to help sustain Wologizi's outstanding conservation value in the future:

1. *Wologizi should be gazetted as a protected area as soon as possible.*
2. *Awareness raising and sensitization are urgently required in the Wologizi communities with regard to protected species and sustainable hunting practices.*
3. *Introduction of defined hunting regulations to reduce the pressure on wildlife in Wologizi, such as exemption of certain animal species (globally threatened, protected species) and individuals (pregnant females, young animals) from hunting or seasonal and spatial restrictions of hunting activities.*
4. *Continuous involvement of communities in conservation activities.*
5. *Consolidate large mammal survey data by follow-up studies, such as:*
    - *Camera trapping study to supplement the database on species diversity, relative abundance and spatial distribution, and help to clarify questions about, for example, the presence of the Jentink's duiker and zebra duiker;*
    - *Primate survey to shed more light on abundances and clarify the potential occurrence of an additional species;*
    - *Chimpanzee study to better understand the population of this critically endangered species in Wologizi;*
    - *Forest elephant study to better understand the population roaming in Wologizi and adjacent forests, i.e., the population size, number of groups and composition as well as seasonal migration patterns; and*
    - *Pygmy hippo specific survey, especially along the major water bodies, to get a better idea about the home range and population size.*

Full details of the results are available in the final report. A draft scientific paper has also been submitted by the consultant and will be published once a journal has been selected.

Figure 2. Leopard footprint in the Wologizi proposed protected area

(Photo courtesy of B. Forster)

Figure 3. Large mammal survey team conducting hunter interviews in Wobeyammai, Lofa County

(Photo courtesy of P. T. Dia)

Bird survey

The bird team conducted their survey in Wologizi in December before going to Ziama in February. Line transects were walked during morning and afternoon hours to record bird species, with two teams working concurrently to complete eight transects each per day. Mist nets were also used during the survey. The team faced a number of challenges due to several vehicle breakdowns. Also, one community refused to let the team enter the forest because their sons were still with the large mammal team and had not yet returned, and they had to inform the surrounding communities before allowing the team to go in. This was very unfortunate because it meant the team was unable to survey an important section of Wologizi.

A total of 289 individual birds were recorded during the survey (158 in the Wologizi PPA and 131 in the Ziama MAB), comprising 205 species in 47 families. Seven species of global conservation concern were recorded, including: white-backed vulture (*Gyps africanus*) CE, Timneh parrot (*Psittacus timneh*) EN, white-breasted guineafowl (*Agelastes meleagrides*) VU, rufous fishing owl (*Scotopelia ussheri*) VU, yellow-casqued hornbill (*Ceratogymna elata*) VU, yellow-bearded greenbul (*Criniger olivaceus*) VU and green-tailed bristlebill (*Bleda eximius*) NT (Tende & Adeyanju, 2019). Out of the seven threatened species recorded, the yellow-casqued hornbill, white-breasted guineafowl and yellow-bearded greenbul were recorded in both Wologizi and Ziama; the green-tailed bristlebill was recorded only in Ziama; and the white-backed vulture, rufous fishing owl and Timneh parrot were recorded only in Wologizi.

The total number of forest specialists (biome-restricted species for the Guinea-Congo forest biome) sighted totaled 92 (across the two sites), which is exactly half of the total biome-restricted species identified by Robertson (2001) in Wologizi, Liberia (Tende & Adeyanju, 2019). Similarly, the total

number of forest specialists recorded during this survey in Ziama was 72, which is again exactly half of the total recorded by Robertson (2001). This is thought to be due to the limited survey time. The team also suffered vehicle breakdowns, were refused access to an area where they would have reached core forest in Wologizi and in one community were given guides that did not know the area, so time was wasted getting to the survey site.

Figure 4. Bird team hard at work in Ziama (left); rocky outcrop in Ziama Man and Biosphere Reserve (right)

(Photos courtesy of G. N. Allison)

Recommendations as a result of the survey include effective protection for Wologizi and continuous avian surveys to adequately document the bird fauna within the ZWW landscape. A full list of species recorded and details of the survey are available in the final report.

Insects (butterflies)

The butterfly survey in Ziama got off to a dry start due to the extended dry season this year, which resulted in low butterfly numbers. A total of 428 species were recorded which, at the end of the dry season, is a very high number. Numerous Upper Guinean endemics, two new species, six Liberian sub-region endemics, three restricted-range species and two new subspecies were recorded (Safian, 2019). One undescribed subspecies is probably endemic to Ziama and/or maybe to another few forest areas in Guinea (maybe Liberia) but was found only at the single locality in an upland swamp above Sérédou (Safian, 2019). It should be noted that high-altitude species are missing from the data, as it was not possible to survey such sites due to time and access constraints. Such a survey would require careful planning and another 3 to 4 weeks (Szabolcs, 2019).

The results of the survey prove that the Ziama forest, with its large size and diverse macro- and microhabitats, represents one of the most important sites for the conservation of butterfly fauna in Guinea. The site should be of high conservation priority for its butterflies alone and is probably the most species-diverse PA for butterflies in Guinea. Ziama is probably sufficiently large also to resist climate change and provide a network of habitats for butterfly communities.

Recommendations include:

- Survey high-altitude forests (>1000 m a.s.l.) and hilltops, as it was not possible to survey these areas due to time and the required logistics;
- Stop unnecessary wide forest clearance alongside the road to avoid bisecting the forest and preventing or reducing gene-flow and dispersion of deep forest-dwelling butterflies; and
- Ensure effective protection of the Ziama forest to secure the survival of this outstanding and unique butterfly fauna.

Further details are available in the final report.

Figure 5. New subspecies Neurellipes helpsi recorded at Sérédou

(Photo courtesy S. Safian)

Plant survey

Guinean botanical expert Moussa Diabate led the botanical survey in Ziama in February and Wologizi in May 2019. The variable area transect method (Sheil et al., 2003, 2004) served as a basis for the assessment. This allows a rapid characterization of the structure, density and floristic composition (diversity) of forests (Diabate, 2019). Fifty-one survey points were plotted on the Ziama MAB zonation map, including 26 points on the central area and 25 points in the buffer (Diabate, 2019). The plot locations considered the hydrographic network and contour lines that are determinant for forest habitat types and plant species. Twenty-one survey points were identified with assistance from Philip Tem Dia (FFI biodiversity technical specialist, ZWW) in Wologizi based on different elevations (Diabate, 2019).

Seven hundred twelve species belonging to 103 families were recorded in Ziama, of which 200 are trees, 169 shrubs, 117 lianas, 190 grasses, 4 epiphytes, 1 parasite, 16 ferns and 15 orchids. Wologizi had fewer plant species, with 403 species in 75 families recorded, of which 127 are trees, 114 shrubs, 5 liana shrubs, 19 shrubs, 48 lianas, 78 grasses and 12 epiphytes (Diabate, 2019). Twenty-eight Red List species were recorded at Ziama (2 endangered, 1 near threatened and 25 vulnerable) and 21 were recorded at Wologizi (1 endangered, 1 near threatened and 19 vulnerable), giving a total of 29 Red List species recorded across the two sites (2 endangered, 1 near threatened and 26 vulnerable).

Milicia excelsa (International Union for Conservation of Nature [IUCN] classification: near threatened) and the endangered *Neolemonniera clitandrifolia* were recorded at both sites in the landscape. *N. clitandrifolia* is a rare species and occurs scattered throughout dense humid forest. It has experienced a rapid decline in population numbers as a result of habitat loss due to agriculture, mining and logging.

Figure 6. Gallery forest in Ziama

(Photo courtesy of M. Diabate)

Ziama hardwood (*Pericopsis elata*), also known as African teak, is classified on the IUCN Red List as endangered and is listed on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Appendix II. It occurs in both wet and dry forests and was only recorded in Ziama during this survey. This species occurs in Côte d'Ivoire and to the east in the Central African Republic and Democratic Republic of Congo (Bourland et al., 2012).

The difference in the number of species recorded between the two sites is thought to be a result of Ziama comprising 10 vegetation formations, compared to six in Wologizi. Vegetation formations identified at the two sites are listed in the table below:

Table 1. Vegetation forms recorded in the Ziama Man and Biosphere Reserve and Wologizi proposed protected area

	Ziama	Wologizi
1	High-altitude moist dense forest	High-altitude moist dense forest
2	Medium-altitude moist dense forest	Medium-altitude moist dense forest
3	Low-altitude moist dense forest	Low-altitude moist dense forest
4	Forest gallery	Forest gallery
5	Swamp forest	Savannah
6	Shrub savannah on thin soil	Secondary forest
7	Secondary forest	
8	Monospecific forest plantation	
9	Agroforest	
10	Shoal	

The survey found that the high- and medium-altitude moist forests are well conserved in Wologizi. High-altitude forests contain priority species for conservation, such as *Lophira alata* and *Lovoa trichilioides* (African walnut). The mid- to high-density moist forests contain an unprecedented number of priority conservation plant species for the IUCN, such as *Entandrophragma* spp., *L. trichilioides* and *Khaya* spp. Lowland forests in Wologizi contained more than 20 priority conservation species on the IUCN Red List.

Despite pressure from human activities, the survey found that Ziama's forest is mostly well preserved. It is rich and diverse in natural habitats and plant species, and it features characteristic plant species from submontane areas and dense moist forest, such as *Tieghemela heckeri, Sterculia oblonga, Olfieldia africana, Chrysophyllum* spp., *Turraeanthus africana* and others (Diabte, 2019). Not surprisingly, forest areas in close proximity to communities were the most degraded at both sites.

Recommendations include empowering and involving local communities in the conservation and management of Wologizi and Ziama; development of income-generating activities; and agreements with Wologizi communities to implement rules for the management and conservation of the biodiversity of Wologizi, and training of eco guards in the management and conservation of biodiversity in Ziama (Diabate, 2019).

A full species list and further details of this rapid botanical survey can be found in the final reports.

Reptile and amphibian survey

The reptile and amphibian team led by herpetile specialist Joseph Doumbia completed the survey in Ziama at the end of March and the Wologizi survey in April.

"Random collection (all-round search) and transect methods proposed by Heyer et al. (1993) and Rödel and Ernst (2004) from direct observations (including capture of individuals) associated with acoustic observations (listening to specific croaking) were used for sampling amphibians. As for reptiles, the method was random based on direct observation. Visual encounter surveys were used to determine the species richness of the study area and species communities at the local level." (Doumbia, 2019).

The final report is pending identification and genetic analysis of specimens due to export delays to the Berlin Museum of Natural History. However, preliminary results include 50 species of amphibians and 11 reptiles recorded in Ziama, compared to 33 amphibians and 11 reptiles in Wologizi (Doumbia, 2019).

Two species of global conservation concern were recorded in Wologzi, including the African dwarf crocodile (*Osteolaemus tetraspis*) and Home's hinge-back tortoise (*Kinixys homeana*), both classified as vulnerable on the IUCN Red List. Five individuals of the African dwarf crocodile were observed at two sites situated just outside of the Wologizi PPA to the northwest and southwest. Home's hinge-

back tortoise was recorded on the southwest edge of Wologizi in primary forest not far from rivers and was often caught close to mushrooms, on which it was probably feeding (Doumbia, 2019).

Four species of global conservation concern were recorded in Ziama, including three endangered species—Langer's squeaker (*Arthroleptis langeri*), ringed river frog (*Phrynobatrachus annulatus*), Western gecko (*Cnemaspis occidentalis)* and the vulnerable Ziama torrent-frog (*Odontobatrachus ziama*). *O. ziama* is difficult to differentiate from *O. natator*, which also occurs in the Ziama forest, so genetic analysis remains the best way to be sure. The Western gecko is very exciting, as it is only known from five disjunct montane regions in West Africa—Mount Nimba at the border area between Guinea and Liberia, the Ziama region of Guinea, the Loma Mountains in Sierra Leone and Mount Tonkui in Côte d'Ivoire (Trape et al., 2012). All of these sites are threatened by mining and deforestation, and the area of occupancy for this species is conservatively estimated at 40–499 km^2 (IUCN, 2013).

Figure 7. African dwarf crocodile (left); Western gecko (right)

(Photos courtesy of J. Doumbia)

Small mammal survey

The results from the small mammal (rodents, shrews, otter shrews and bats) surveys in Wologizi and Ziama yielded great results. The survey was overseen by the University of Eswatini's Prof. Ara Monadjem, and graduate Mnqobi Mamba led the field work. One of the highlights of the survey was confirmation of the presence of the semi-aquatic Nimba otter shrew (*Micropotamogale lamottei*) at Wologizi. The Nimba otter shrew is categorized as vulnerable on the IUCN Red List and is listed in the top 100 Evolutionarily Distinct and Globally Endangered (EDGE) species. Although it is endemic to the Upper Guinean rainforest, it has only been recorded in this region from Mount Nimba and surrounding hills, with two outlying "populations" in the Putu Mountains (Eastern Liberia) and Sérédou (Southeastern Guinea), less than 200 km away (Monadjem et al., 2018).

Below is an excerpt from the final report.

A total of 15 species of rodents, 8 species of shrew, 1 otter shrew and 27 species of bats were captured. One of the rodents (Colomys goslingi) is recorded for the first time from the Upper Guinea forest zone and may represent a new species. At least one shrew species has yet to be identified (awaiting molecular results). One of the bats is almost certainly a new species to science, and a second bat may also be new to science; all awaiting further investigations, particularly molecular analysis. Several species are endemic to the region, and at least three bats (Miniopterus sp. nov., Neoromicia roseveari, Parahypsugo happoldorum) and one shrew (Crocidura nimbasilvanus) have only recently been described and are also endemic.

In conclusion, ZWW has a high diversity of rodent, shrew and bat species, many of which are endemic to the region, and a few that are threatened. Small mammal species richness and composition was similar between Wologizi and Ziama, which is not surprising considering that these two areas are only 25 km apart and in a

similar habitat. It is suspected that most species we only recorded at one or the other site will probably be shown to occur at the other site in the future. Therefore, from a conservation planning and management perspective, it might be best to consider the complete list as applying to the entire area (rather than separating out Wologizi and Ziama).

The numbers of species recorded in ZWW is not particularly high compared with other areas in the Upper Guinea forest zone. For example, Mt. Nimba (Liberia/Guinea) and Taï National Park (Côte d'Ivoire) both have high species richness of bats. However, what is striking about ZWW is the high number of species endemic to the region. This, no doubt, is a result of this area being a biogeographic refugium where populations of forest-dwelling species have survived during periods of environmental instability. In similar vein, the area may also have acted as a "species pump," explaining the high number of endemics. In either case, the ZWW region is considered an important (if not critical) area for small mammals of the Upper Guinea forests.

It is highly recommended to conduct follow-up surveys of small mammals in ZWW to establish whether any other new species to science occur, and to collect basic ecological information of the newly described species. For conservation planning and management, it is best to consider the complete species list as applying to the entire area (rather than separating out Wologizi and Ziama).

Figure 8. Prof. Ara Monadjem and the small mammal rapid biodiversity survey field team in the Wologizi proposed protected area

Figure 9. Nimba otter shrew feeding on its main prey of freshwater crab

(Photo courtesy of A. Monadjem)

1.3.2: High conservation value assessment

HCV survey of tree crop plantations in Wonegizi

The HCV survey of the tree crop farms in Wonegizi was completed in December and was led by Dr. Jacinta Abalaka from the A.P. Leventis Ornithological Institute (APLORI). The survey was initially planned for August 2018, however the survey could not be completed then due to heavy rainfall and incidences of falling trees.

The team worked in five communities to assess the importance of tree crop plantations for biodiversity conservation. Farms surveyed included cocoa, coffee and kola nut farms. Birds on 28 plantations and 15 points in the adjacent forest patches were surveyed using the point count survey method. Audio-visual recordings were used to identify birds, and a 10 m x 10 m quadrat was sampled at each point to record accompanying vegetation measurements. The team also set up mist nets in one of the sites where four birds were trapped and ringed. The following is an excerpt from the final report.

A total of 79 bird species were recorded (69 species on the plantations and 48 in the forest habitats). Six species of conservation concern based on the IUCN Red List were recorded during this survey. Three of these species were recorded on the plantations. Fifty-eight percent of the total species recorded were also important bird area (IBA) trigger species, of which 38 of these species were recorded on the plantations. Eighty-seven percent of all recorded species are endemic to the African tropical rain forest or to Africa. Fifty-four of these endemic species were recorded on the plantations. Although mean species diversity between the plantations and the forest habitats were similar, this was higher in the forest. The assemblage of IBA trigger species and endemic species on the plantations surveyed in this study conforms with one of the criteria (HCV

1) for considering an area as of HCV. The plantations in the buffer zone of the Wonegizi Proposed Protected Area can therefore be considered as areas of High Conservation Value (HCV) (Abalaka, 2019).

Figure 10. Dr. Jacinta Abalaka and team conducting the high conservation value survey in the Wonegizi proposed protected area

(Photo courtesy of J. Abalaka)

Challenges during the survey included communication, as the messaging (specifically details on the arrival of the survey team) was jumbled or not delivered at all in some of the towns. Communicating what was needed to the guides was often a challenge as well. Another issue was access to certain farms. There were often no intact forests adjacent to the farms, so the nearest forests were used for the survey.

HCV V (basic necessities) and VI (cultural values)

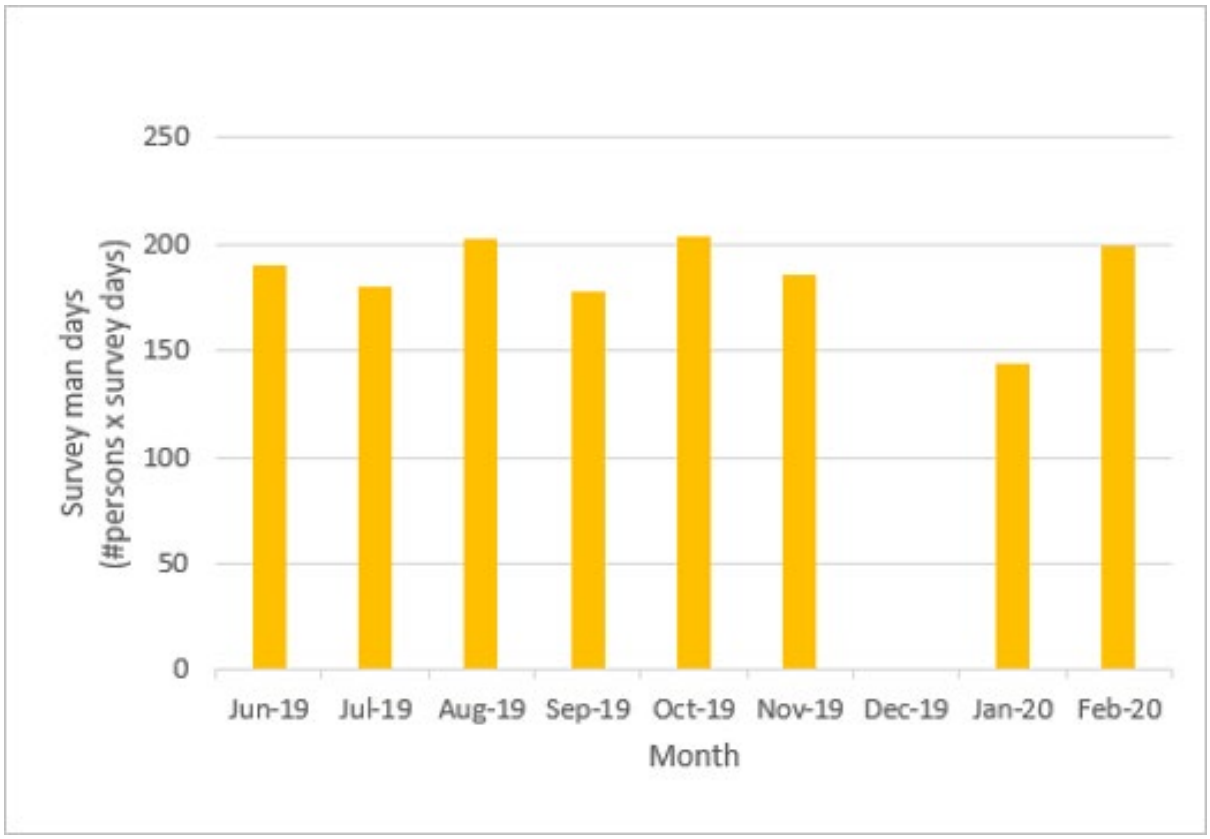
HCV V (basic necessities) and HCV VI (cultural values) assessments and mapping were completed in the 13 communities that surround Wonegizi (funded by NORAD). The REDD+ team also created awareness about the grievance redress mechanism to inform the communities about how they may channel any grievances to key stakeholders or project implementers. A stakeholder mapping and capacity needs assessment for the FMC were also conducted by the REDD+ team.

1.3.3: Biomonitoring

Liberia

A biomonitoring protocol was developed for Wonegizi by former FFI technical specialist for West and Central Africa Michelle Klailova and Philip Tem Dia (biodiversity technical specialist, ZWW). Biomonitoring surveys commenced in June once the protocol had been updated with inputs made by the participants at the training held in March. The Wonegizi teams have conducted a total of 250 days of biomonitoring for the period June 2019–February 2020, which gives a total survey effort of 1483 survey man days.

Figure 11. Biomonitoring survey effort (# persons x survey days) per month in the Wonegizi proposed protected area



A total of 20 different animal species have been identified during biomonitoring in the WPPA, including six globally threatened species: Western chimpanzee (critically endangered), pygmy hippopotamus and Jentink's duiker (endangered); and three vulnerable species (forest elephant, leopard and olive colobus). Table 2 below shows the animal species identified and their IUCN status.

The WPPA is divided into three administrative zones: Zone 1 in the south covers Dorzenilor, Vetesu and Ziggida; Zone 2 includes I-mah, Barwen, Kargbota, Madina, Nekebozu and Barziwen; and Zone 3 includes Goyala, Tusu, Bulor and Lutisu. Table 3 shows teams recorded the most large mammal species in Zone 1 (17 species), followed by Zone 3 (14 species) and Zone 2 (11 species).

Figure 12 indicates that elephant and chimpanzee signs were recorded mostly in the northern section of the PPA during the project period (December 2018–February 2020). This area still has a strip of forest for now, but it is at risk of being cut off from the rest of Wonegizi due to the presence of the road, settlements next to the water and forest clearing for agriculture. These species may also be using the area as a corridor to or from Ziama. In contrast, pygmy hippopotamus signs were only encountered in the central area of Wonegizi, reflecting the forested area next to the waterway in its interior. It is important to continue monthly and systematic biomonitoring in order to understand seasonal movements and monitor the effectiveness and impact of park management operations.

The WPPA harbors wildlife species of global importance. Unfortunately, human activities are having a huge negative impact on the park. Hunting activities are very intense in this area and occur all over due to the proximity to the communities and also its small size. It is therefore important to gazette the PPA as soon as possible, and implement an effective management plan for conservation and sustainable development. FFI in partnership with the FDA has made significant progress towards gazettement, and communities are very supportive of the process. Continuation and expansion of initiatives such as the Agricultural Transformation Strategy under NORAD to improve food security and reduce pressure on the park and surrounding forests from farming, and provision of alternative

income-generating activities is paramount to the protection of Wonegizi. If feasible, development of ecotourism sites and facilities could potentially help bring some benefits to the local population. In addition, ongoing education and awareness on the wildlife law, ecosystem services, conservation, environmental sustainability and inclusion of community members in park management and activities (e.g., biomonitoring, law enforcement, awareness etc.) are important now and going forward. Verification as a REDD+ site will go a long way to ensuring Wonegizi's future is secured as an effective, multiple-use reserve that benefits communities and the country.

Table 2. Large mammal species recorded in the Wonegizi proposed protected area

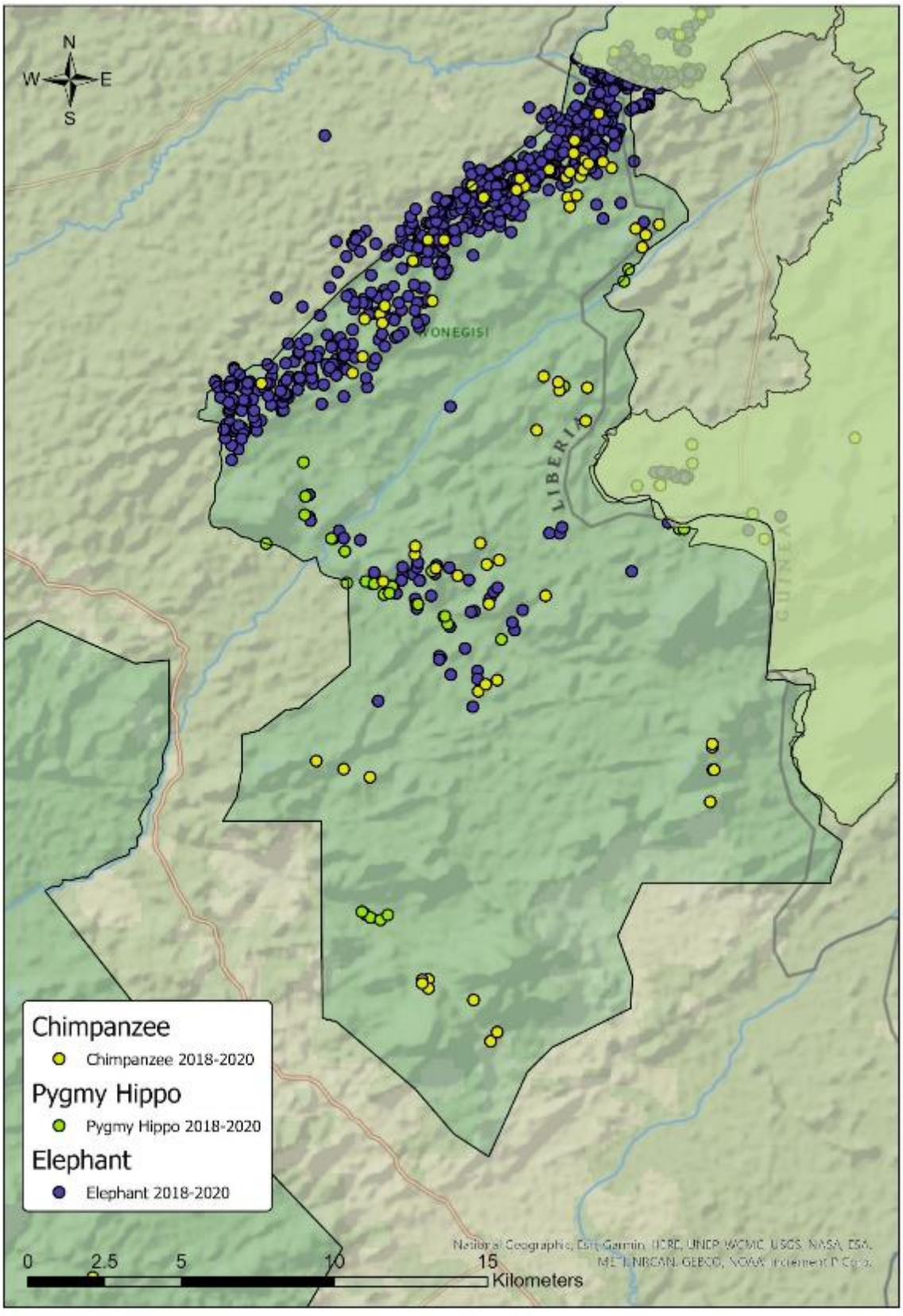
No.	Common Name	Scientific Name	IUCN Status
1	Western Chimpanzee	*Pan troglodytes verus*	Critically endangered
2	Jentink's Duiker	*Cephalophus jentinki*	Endangered
3	Pygmy Hippopotamus	*Choeropsis liberiensis*	Endangered
4	Leopard	*Panthera pardus*	Vulnerable
5	Forest Elephant	*Loxodonta africana*	Vulnerable
6	Olive Colobus	*Procolobus verus*	Vulnerable
7	Yellow-backed Duiker	*Cephalophus silvicultor*	Near Threatened
8	Bay Duiker	*Cephalophus dorsalis*	Near Threatened
9	Sooty Mangabey	*Cercocebus atys*	Near Threatened
10	Bongo	*Tragelaphus eurycerus*	Near Threatened
11	Diana Monkey	*Cercopithecus diana*	Near Threatened
12	Forest Buffalo	*Syncerus caffer nanus*	Near Threatened
13	Maxwell Duiker	*Philantomba maxwellii*	Least Concern
14	Black Duiker	*Cephalophus niger*	Least Concern
15	Red River Hog	*Potamochoerus porcus*	Least Concern
16	Lesser Spot-nosed Monkey	*Cercopithecus petaurista*	Least Concern
17	Bushback	*Tragelaphus scriptus*	Least Concern
18	Forest Hog	*Hylochoerus meinertzhageni*	Least Concern
19	Ogilby's Duiker	*Cephalophus ogilbyi*	Least Concern
20	Campbell's Monkey	*Cercopithecus campbelli*	Least Concern

Table 3. Large mammal species recorded during biomonitoring surveys (June 2019–February 2020) in the three zones of the Wonegizi proposed protected area

No.	Common Name	Scientific Name	Zone 1	Zone 2	Zone 3
1	Western Chimpanzee	*Pan troglodytes verus*	X	X	X
2	Jentink's Duiker	*Cephalophus jentinki*		X	
3	Pygmy Hippopotamus	*Choeropsis liberiensis*	X	X	
4	Leopard	*Panthera pardus*	X		X
5	Forest Elephant	*Loxodonta africana*	X	X	X
6	Olive Colobus	*Procolobus verus*	X		
7	Yellow-backed Duiker	*Cephalophus silvicultor*	X		X
8	Bay Duiker	*Cephalophus dorsalis*	X	X	X
9	Sooty Mangabey	*Cercocebus atys*	X		X
10	Bongo	*Tragelaphus eurycerus*		X	
11	Diana Monkey	*Cercopithecus diana*	X	X	
12	Forest Buffalo	*Syncerus caffer nanus*			X
13	Maxwell Duiker	*Philantomba maxwellii*	X	X	X
14	Black Duiker	*Cephalophus niger*	X		X
15	Red River Hog	*Potamochoerus porcus*	X	X	X

No.	Common Name	Scientific Name	Zone 1	Zone 2	Zone 3
16	Lesser Spot-nosed Monkey	*Cercopithecus petaurista*	X	X	X
17	Bushback	*Tragelaphus scriptus*	X		X
18	Forest Hog	*Hylochoerus meinertzhageni*	X		
19	Ogilby's Duiker	*Cephalophus ogilbyi*	X		X
20	Campbell's Monkey	*Cercopithecus campbelli*	X	X	X
	Total number of mammal species per zones		17	11	14

Figure 12. Spatial distribution of chimpanzee, elephant and pygmy hippopotamus signs recorded in the Wonegizi proposed protected area (June 2019–February 2020 biomonitoring data and December 2018–February 2020 law enforcement patrol data)



Guinea

In Ziama, biomonitoring surveys continued (camera trapping—one team of four guards for eight days; elephant monitoring patrols—three teams of four guards; and one HWC team of two guards for fifteen days each). The elephant teams have been monitoring elephants since April 2016, while also collecting basic biomonitoring data on other species. Signs of the pygmy hippopotamus were recorded near Dopamai for the first time in March 2019.

A total of 23 different animal species have been recorded by the guards during elephant monitoring in the Ziama MAB, including one critically endangered species (Western chimpanzee), one endangered species (pygmy hippopotamus), three vulnerable species (forest elephant, leopard and black-bellied pangolin) and five near threatened (yellow-backed duiker, bay duiker, African clawless otter, bongo and forest buffalo). Table 4 below shows the animal species identified and their IUCN status.

Table 4. Species recorded in the Ziama Man and Biosphere Reserve during elephant monitoring patrols

Common Name	Scientific Name	IUCN status
Forest Elephant	*Loxodonta cyclotis*	Vulnerable
Pygmy Hippopotamus	*Choeropsis liberiensis*	Endangered
Western Chimpanzee	*Pan troglodytes verus*	Critically Endangered
Bongo	*Tragelaphus eurycerus*	Near Threatened
Campbell's Monkey	*Cercopithecus campbelli*	Least Concern
Black Duiker	*Cephalophus niger*	Least Concern
Yellow-back Duiker	*Cephalophus silvicultor*	Near Threatened
Bay Duiker	*Cephalophus dorsalis*	Near Threatened
Maxwell's Duiker	*Philantomba maxwellii*	Least Concern
Forest Buffalo	*Syncerus caffer nanus*	Near Threatened
Leopard	*Panthera pardus*	Vulnerable
Bushbuck	*Tragelaphus scriptus*	Least concern
Red River Hog	*Potamochoerus porcus*	Least Concern
Common Cusimanse	*Crossarchus obscurus*	Least Concern
African Clawless Otter	*Aonyx capensis*	Near Threatened
Monitor Lizard	*Varanus sp.*	
Black-bellied Pangolin	*Uromanis tetradactyla*	Vulnerable
Rock Hyrax	*Procavia capensis*	Least Concern
Forest Hinged Tortoise	*Kinixys erosa*	Data Deficient
Genet	*Genetta sp.*	
Gambian Rat	*Cricetomys gambianus*	Least Concern
African Civit	*Civettictis civetta*	Least Concern
Greater Cane Rat	*Thryonomys swinderianus*	Least Concern
African Brush-tailed Porcupine	*Atherurus africanus*	Least Concern

HWC continues to be an issue in Ziama due to regular crop raiding by elephants. For example, in August 2019, 21 fields belonging to 16 farmers (six of whom are women) were raided by elephants. Two hundred seventy-seven cases of damage were recorded involving 11 crop types: maize, taro, banana, cassava, rice, pineapple, melon, cow peas, coffee, cocoa and potatoes. FFI Guinea will begin to pilot different initiatives aimed at deterring elephants, including growing pepper and keeping bees. Further discussions with NGO partners are also ongoing to learn methods from other countries, such as with The Namibian Association of CBNRM Support Organizations (NACSO) in Namibia, where HWC is very prevalent and there is a HWC insurance scheme funded by the conservancies through ecotourism and other livelihood activities related to conservation. Sustainable options for mitigating damage to crops through the Village Savings and Loan Association (VSLA) are also being considered.

Expansion of sustainable livelihood options will assist in reducing pressure on the reserve, as well as continued and effective law enforcement. Implementation of the Ziama management plan will require involvement and support from the communities for the reserve's successful management, as well as ongoing awareness and sensitization about the benefits of conservation.

Landscape level results

Data from the law enforcement and biomonitoring surveys in Wonegizi and Ziama, rapid biodiversity assessments and camera trapping in Wologizi were combined and used to generate maps to show species distribution across the landscape. Figure 13 shows the coverage of the different surveys conducted during the project's lifetime. Note that coverage does not indicate effort, and thus the distributions shown on the map represent minimum range (absence in a grid cell is not definitive proof that a species is not present).

Figure 13. Area covered by rapid biodiversity assessments, camera trapping and law enforcement and biomonitoring in the Ziama-Wonegizi-Wologizi landscape

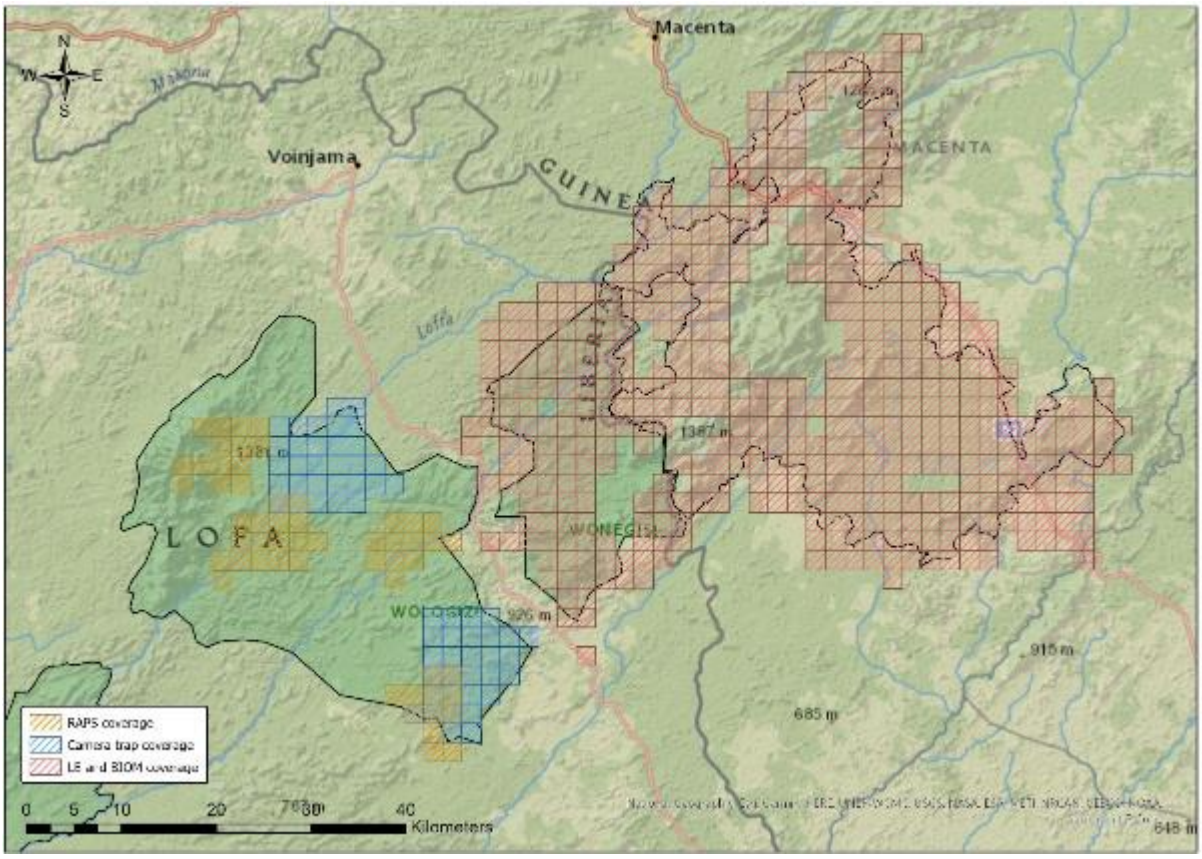


Figure 14. Western chimpanzee presence in the Ziama-Wonegizi-Wologizi landscape

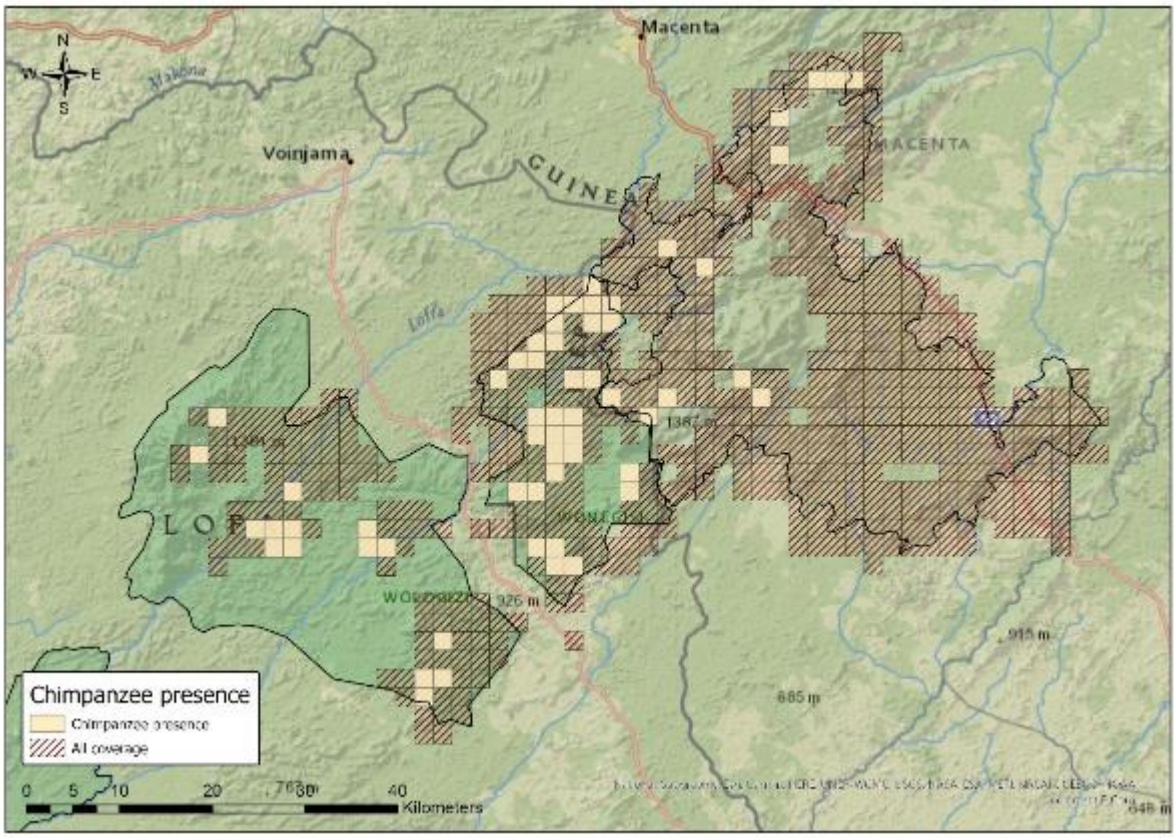


Figure 15. Pygmy hippopotamus presence in the Ziama-Wonegizi-Wologizi landscape

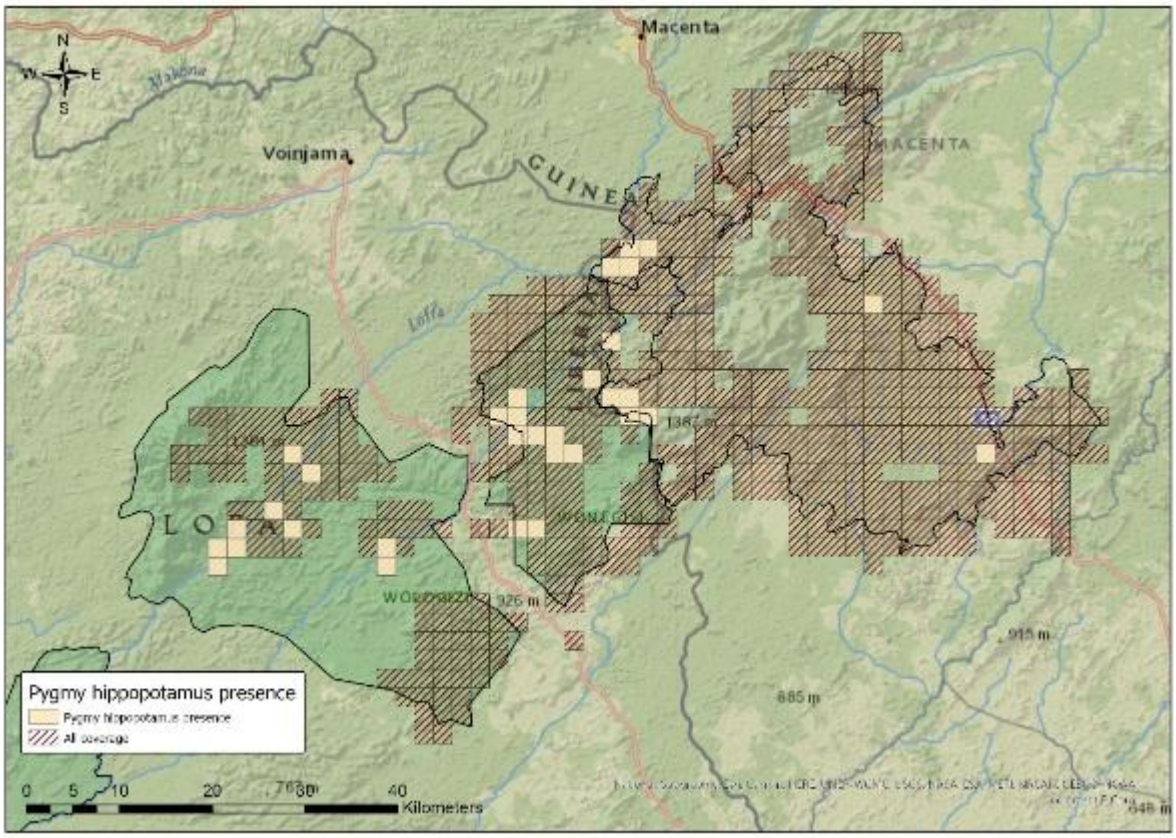


Figure 16. Forest elephant presence in the Ziama-Wonegizi-Wologizi landscape

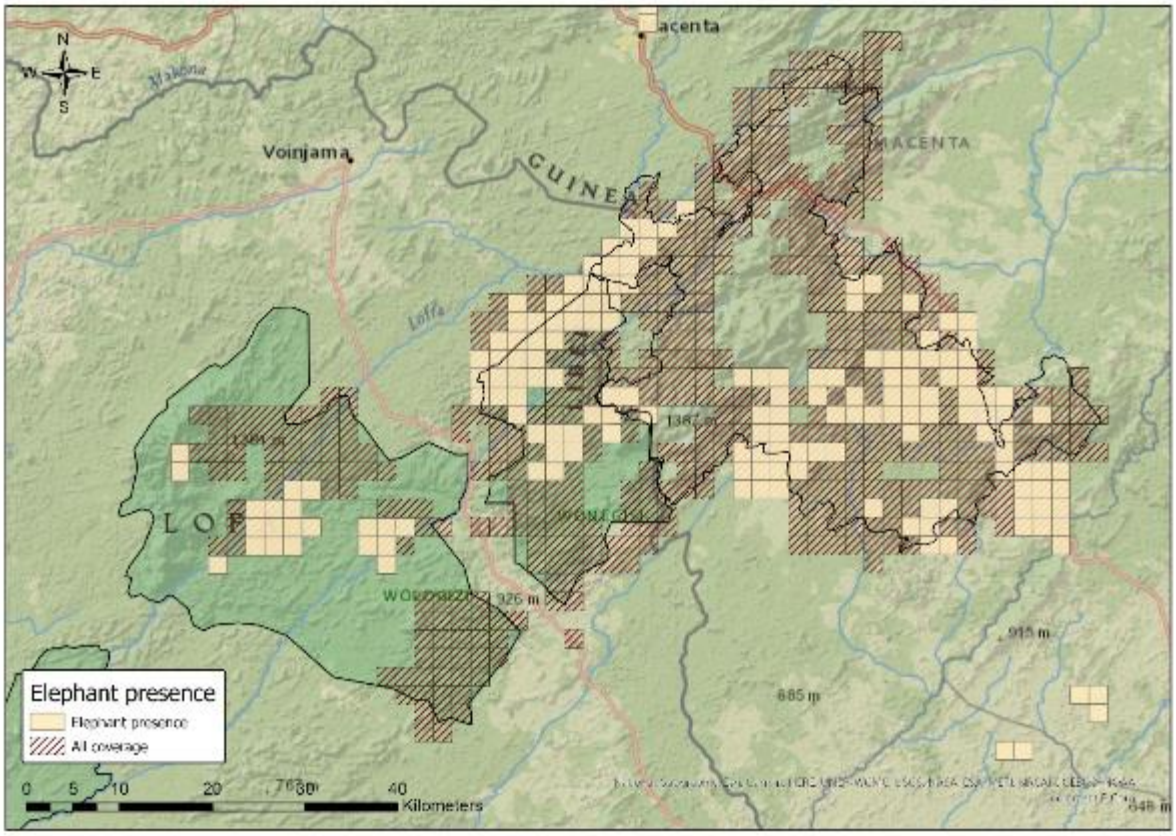


Figure 17. Pangolin species presence in the Ziama-Wonegizi-Wologizi landscape

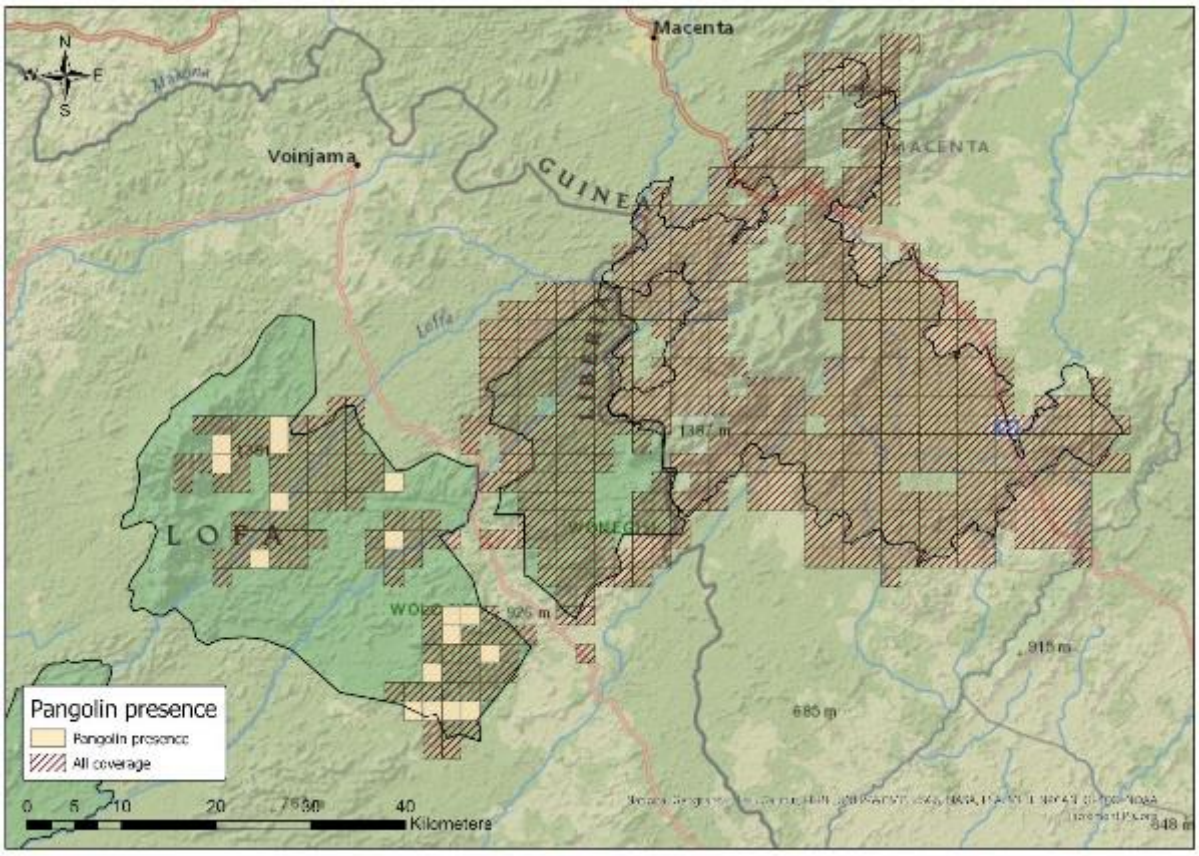


Table 5. Globally threatened mammal species recorded in the Ziama-Wonegizi-Wologizi landscape

Common Name	Scientific Name	IUCN Status	Wologizi	Wonegizi	Ziama
Western Chimpanzee	*Pan troglodytes verus*	Critically Endangered	X	X	X
Pygmy Hippopotamus	*Choeropsis liberiensis*	Endangered	X	X	X
Jentink's Duiker	*Cephalophus jentinki*	Endangered	X	X	
White-bellied Pangolin	*Phataginus tricuspsis*	Endangered	X		
Ziama Horseshoe Bat	*Rhinolophus ziama*	Endangered	X		
Rosevear's Serotine	*Neoromicia roseveari*	Endangered	X		X
Forest Elephant	*Loxodonta cyclotis*	Vulnerable	X	X	X
Black-bellied Pangolin	*Uromanis tetradactyla*	Vulnerable			X
Olive colobus	*Procolobus verus*	Vulnerable		X	
Leopard	*Panthera pardus*	Vulnerable	X	X	X
King Colobus	*Colobus polykomos*	Vulnerable	X		
African Golden Cat	*Caracal aurata*	Vulnerable	X		
Zebra Duiker	*Cephalophis zebra*	Vulnerable	X		
Giant Ground Pangolin	*Smutsia gigantea*	Vulnerable	X		
Nimba Otter Shrew	*Micropotamogale lamottei*	Vulnerable	X		
Aellen's Roundleaf Bat	*Hipposideros marisae*	Vulnerable	X		
Guinean Horseshoe Bat	*R. guineensis*	Vulnerable	X		X

Note: Table includes information from the datasets of the large and medium mammal rapid assessments in Wologizi and Wonegizi, small mammal rapid assessments in Wologizi and Ziama, camera trap survey in Wologizi and law enforcement and biomonitoring data in Wonegizi and Ziama.

Prof. Monadjem (small mammal expert) recommended that for conservation planning and management, it is best to consider the complete species list as applying to the entire ZWW area (rather than separating out by site). Therefore, based on current data, the mammal species list for the ZWW landscape contains 17 globally threatened species. By comparison, Liberian Nimba and the surrounding area has 14 globally threatened species recorded (Scott Wilson pers. comm.). Camera trapping across the ZWW landscape should reveal a more detailed picture of large mammal abundance and distribution.

1.3.4: Develop and implement camera trapping in Wologizi

Following unforeseen delays, which resulted in having to repeat the procurement process after the first selected vender was unable to ensure the camera traps for shipping, a payment was made at the beginning of April 2019 and the cameras were received in Liberia. A camera trapping protocol was developed with the aim of covering 80% of the landscape by the end of 2021. Community auxiliaries were selected for the training and, at the same time, 12 communities were sensitized about the planned camera trap survey in Wologizi by the biodiversity technical specialist for the ZWW and the FDA zone warden for Zone 1. Training on the protocol was conducted in Voinjama for FDA rangers and community auxiliaries in June 2019.

Two grids comprising 30 cameras each in 2 x 2 km quadrats were surveyed, covering 240 km^2 (~24%) of the PPA. One grid was located in the southeast and the second in the north central part of the PPA. These were chosen for their accessibility and, given this was the first deployment of this magnitude, provided the opportunity to test deployment and retrieval logistics and longevity of rechargeable batteries. All 60 camera traps were deployed in July, and batteries and memory cards were changed after 45 days. The first part of the Wologizi survey lasted for a period of 3 months. The camera traps were deployed for a total of 5164 camera trap days, capturing 27,074 photos. Surveys of the remaining grids were beyond the scope of this project (due to budget and time constraints) and will be completed under different funding.

A total of 39 species have been identified from the photos, of which eight were globally threatened species, including: Western chimpanzee (critically endangered); three endangered species (pygmy hippopotamus, Jentink's duiker and white-bellied pangolin); and four vulnerable species (forest elephant, zebra duiker, white-necked rockfowl and Bourlon's genet).

The number of known species per grid cell was calculated showing diversity across the grids surveyed, with the highest number of species at 17 and the least at 0, with a mean between 7 and 8 species. Figure 18 shows species diversity across the surveyed grids. It should be noted that the diversity is a conservative estimate due to the number of species that could only be identified to family or sub-family level.

Furthermore, elephants, pygmy hippos, chimpanzees and pangolins were all found during the survey. Elephants were captured once, both pygmy hippos and chimpanzees twice and pangolins (mostly the white-bellied pangolin) were captured in 12 different locations.

Activity 1.3.5: Participate in species working groups

FFI continued its support for the SWG and hosted a total of four meetings during the grant period (November 2018, January, May and September 2019). An emergency meeting was held in July to develop a proposal and implementation plan (IP) for elephant conservation in Liberia following the format for the Elephant Protection Initiative. The meeting was coordinated by FFI and facilitated by consultant Benedictus Freeman, who collated inputs from members for development of the proposal and IP. A total of 19 persons attended. This group serves as an umbrella network to coordinate activities of all individual species sub-working groups or sub-committees that will be established now and in the future (e.g., animal, plant, law enforcement and biomonitoring sub-committees), including species action planning committees.

Figure 18. Diversity of key species of the two quadrats surveyed to date in the Wologizi proposed protected area

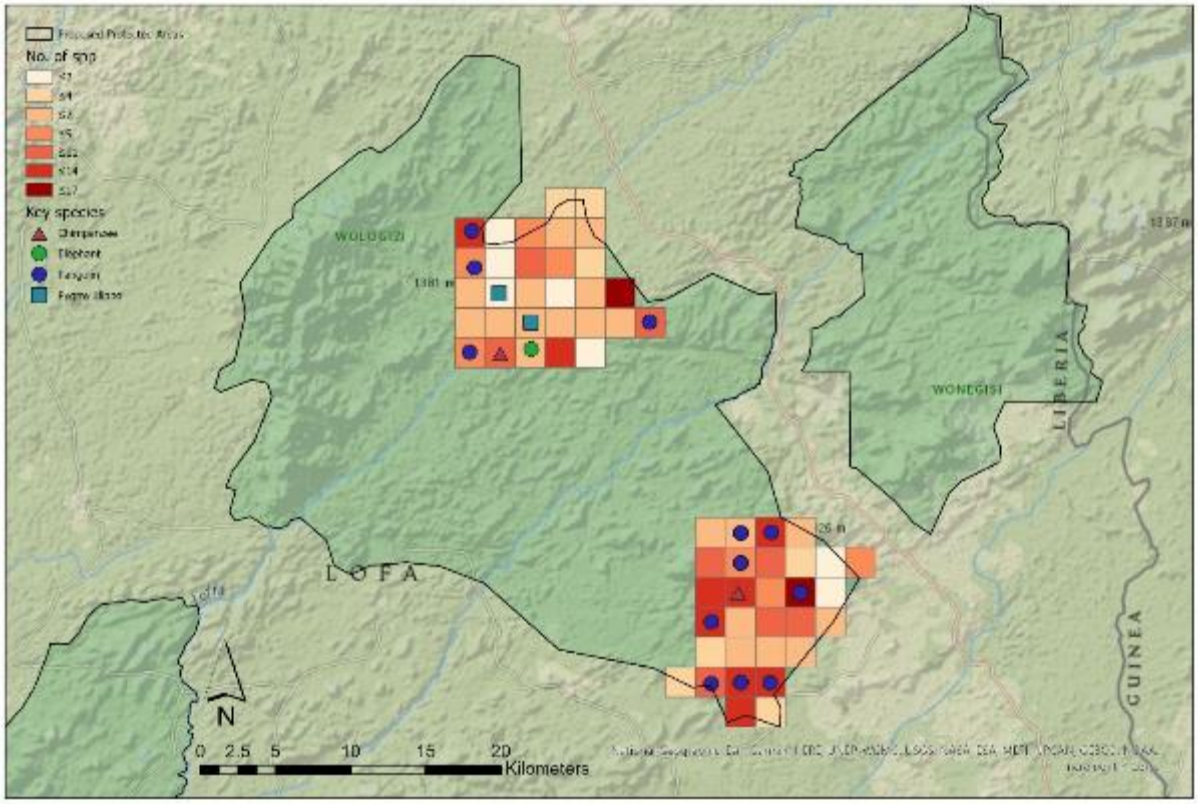


Figure 19. Zebra duiker (left); white-bellied pangolin (right)

FFI participated in a number of sub-committee meetings in the last six months, including participating in six law enforcement sub-committee (LESC) meetings, a biomonitoring sub-committee and one plant and animal sub-committee (PASC) meeting, held in February 2019. FFI also participated in the wildlife law training organized by the Wild Chimpanzee Foundation (WCF) and Liberia Chimpanzee Rescue and Protection (LRCP) for government officials in Monrovia. No SWG meeting was held during December 2018. However, the ZWW project manager attended the forest mapping meeting on December 19th at FDA HQ. The aim of the meeting was to review the updated 2015 Liberia forest cover map, following application of the approved forest classification.

Achievements of the SWG during the grant period include finalization of the SWG ToR, validation of the logo and letterhead and establishment of the PASC. The group's status was clarified in that the SWG will be a part of the FDA and provide technical advice on issues regarding biodiversity in Liberia. Thus, the FDA will take ownership of the final products of the SWG. Via the LESC, the

group has been working on identifying regulations for the Wildlife Conservation and Protected Area Management Law, which is currently under legal review.

The LESC drafted a ToR for the newly established FDA Confiscation Unit and is working with the FDA to ensure coordination with regards to ranger training and training of the judiciary in the Wildlife Conservation and Protected Area Management Law. Members of the LESC met with the MOJ on June 27, 2019 to follow up on discussions about how the MOJ might provide technical support to the FDA to strengthen law enforcement and secure future prosecutions for wildlife crime. The main recommendation from the meeting was for a MoU to be drafted between the FDA, MOJ and partners. Members of the LESC commented on a draft MoU developed by the FDA, and the document is now with the MOJ for review. Under the agreement, the MOJ is tasked with assigning a team of dedicated staff to work on wildlife crime prosecutions.

In August 2019, FFI attended a 2-day workshop organized by the LCRP and funded by the WCF European Union (EU) project that was aimed at developing protocols for the Wildlife Crime Task Force. The workshop was attended by representatives from various enforcement agencies (e.g., Transnational Crimes Unit, FDA, Airport security, MOJ, Liberia National Police [LNP] etc.). Participants reviewed past and current wildlife crime cases to understand the process and steps required to ensure successful prosecutions. Outputs from the workshop included a draft protocol for wildlife crime arrests and prosecutions (the draft protocol is currently under LESC review), and agreement on the format of a directory containing the contact details of all stakeholders to make communication during arrests and prosecutions more efficient. Revision of the 2016 Wildlife Conservation and Protected Area Management Law has been completed by a law firm engaged by Conservation International via the LESC. Technical manager of conservation Blamah Goll met with members of the CITES secretariat during the CITES Conference of the Parties (COP) in Geneva in August 2019, and they seemed satisfied with the progress to date. The revised version will be shared with the CITES secretariat for input, as the law is being revised to ensure compliance with CITES regulations.

The PASC had its first meeting on February 21, 2019 and has drafted a ToR. This sub-committee is planning a training on the tree atlas, and threatened species and the tree atlas will be linked to the World Resource Institute Liberia Forest Atlas. A nationally harmonized protocol for biomonitoring and collection of law enforcement data is still under development. ELRECO and Humane Society International/Second Chance Chimpanzee Refuge Liberia are both applying to become SWG members. Under this grant, FFI presented a laptop to the SWG in September 2019 to support the group's work.

Important progress made with the Biodiversity Information for Development (BID) project is the MoU with the FDA, which intends to strengthen the BID project in Liberia. The dataset being set up by the BID will be managed at the FDA. But for now, the University of Liberia (UL) is managing it in collaboration with Kansas University, USA. FFI is also a collaborating institution. People trained previously in data mobilization will be brought back to enhance their capacity. The SWG recommended the FDA should demand institutions/projects undertaking biodiversity-related activities to register for sharing biodiversity information with the BID project.

A protected species and forest mural was painted on the wall of the compound where FFI has its office. The mural design has attracted a lot of attention, and a teacher was spotted with a group of school children studying the painting.

FFI also chaired the program planning sub-committee of the IDF and was a member of the planning committee for the IDBD and World Chimpanzee Day. Staff from FFI participated on all 3 days, and a second protected species mural was commissioned in Gbarnga, Bong County, for the IDF.

Figure 20. Protected species mural on Fauna & Flora International/Conservation International compound wall

The ZWW project manager, biodiversity technical specialist and FDA seconded staff Menladi Lormie attended the pygmy hippo survey training in Sapo National Park February 25–28, 2019 (funded by FFI's grant under the Critical Ecosystem Partnership Fund [CEPF]). The biodiversity technical specialist for ZWW and PA management technical specialist for Sapo went on to conduct the training for park staff in Wonegizi and Ziama in March to support the roll out of the survey in Liberia and Guinea. The survey will collect invaluable data that will feed into the development of the Regional Pygmy Hippo Action Plan.

The Pygmy Hippo Regional Conservation Action Planning Workshop was conducted July 2–4, 2019 in Monrovia and was attended by 80 people. Drawing on extensive experience of national and regional strategic conservation planning, FFI and partners hosted the regional workshop involving experts, government officials, policy makers and community people to develop a detailed conservation action plan and priorities for regional pygmy hippo conservation in the region. The workshop was facilitated by international consultant Dr. David Mallon. The planning process included a review of progress since the last strategic planning meeting focused on the species.

Workshop participants developed a common vision for the conservation of pygmy hippos in the region and identified priorities for conservation action during the next 10 years. Linkages with current and future national planning efforts were also established during this event. Another important outcome of the workshop was a session to discuss the establishment of the SWG in the other countries—Sierra Leone, Ivory Coast and Guinea. This included a presentation from the SWGL on how the group was formed in Liberia. The idea was positively received by participants from the three countries, and there was a discussion on how they could proceed with setting up similar groups.

Figure 21. Philip Tem Dia (Ziama-Wonegizi-Wologizi biodiversity technical specialist), Constant Ndjassi (technical specialist, protected area management, Sapo landscape) and Centre Forestière de N'Zerekore rangers at the pygmy hippo survey training in Sérédou

3.1.4 ACTIVITY 1.4: IDENTIFICATION OF VIABLE CORRIDORS OF WILDLIFE MIGRATION WITHIN THE ZWW LANDSCAPE THAT STRENGTHEN BIODIVERSITY CONSERVATION

1.4.1: Complete a landscape level assessment for the ZWW landscape

This section presents a selection of some of the results and findings featured in the LLA report. Further technical detail of methods outlined in the full report are available as a technical annex.

The main purpose of the LLA is to provide a recent review of land cover and land cover change, identify viable wildlife corridors, assess areas likely to change due to active pressures and suggest recommendations on priority areas for conservation management. The LLA is intended to support stakeholders in the landscape in making conservation decisions by providing clear patterns and recommendations in the report and a resource for interrogating the data. The LLA will feed into future strategies to secure and manage wildlife corridors across the ZWW landscape.

The main objectives of the LLA are to:

- Compile a spatial database of relevant environmental, geographical, conservation, infrastructure and human datasets to be analyzed. Provide a database for use as a landscape level planning tool;
- Map current land cover and human impact across the landscape;
- Map current risk of deforestation across the landscape;
- Map current infrastructure corridors and extractive industries in the landscape;
- Identify viable wildlife corridors in the landscape; and
- Provide recommendations/strategies on where to secure and manage wildlife corridors in the landscape.

The final report is structured as follows:

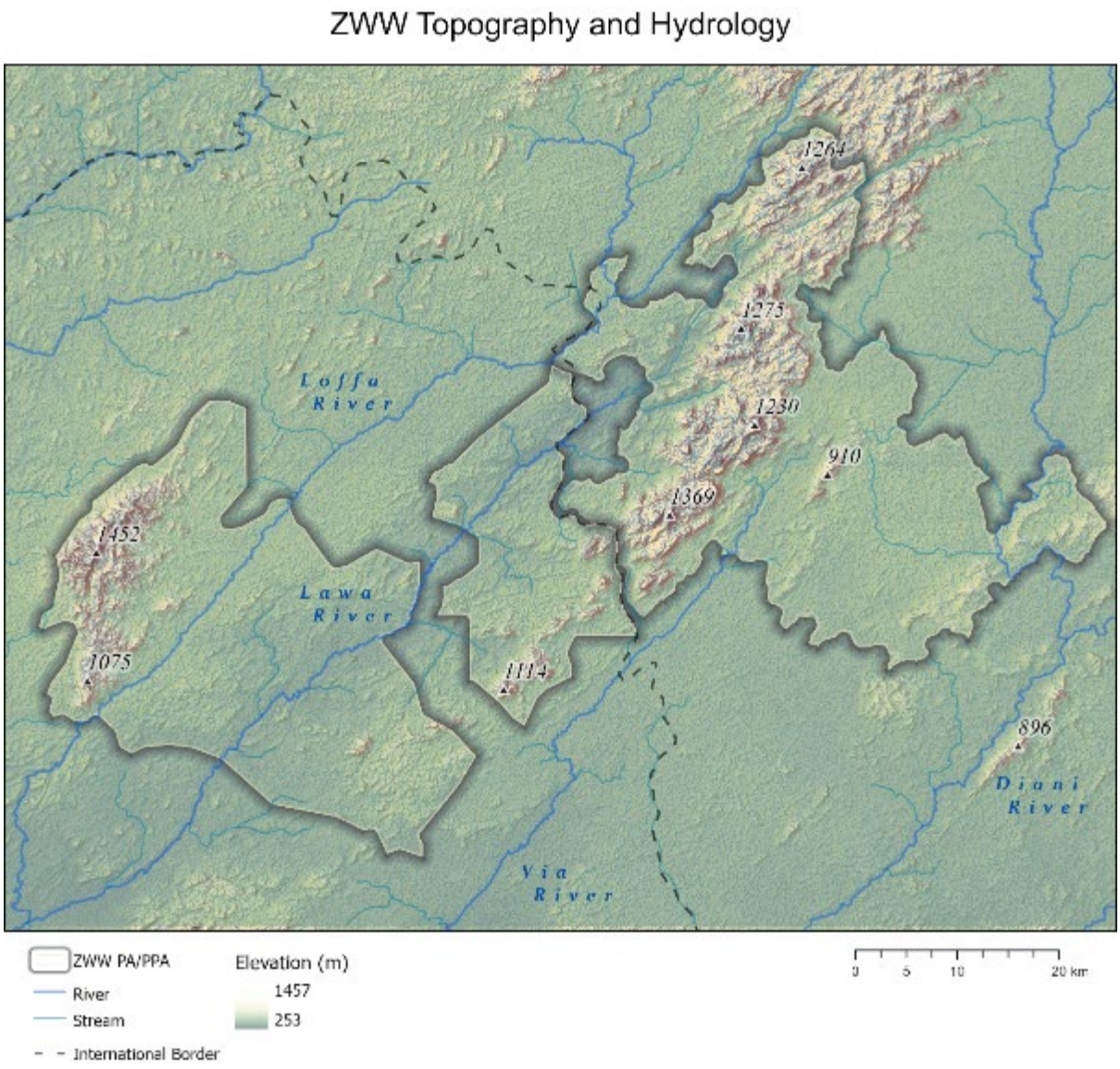
1. Analyses are presented that describe the state of the ZWW landscape. Topics are presented thematically: topography, hydrology, land cover patterns, deforestation risk, extractives and infrastructure, structural forest connectivity and functional forest connectivity are all covered.
2. A consolidation of the analyses of the state of each PPA or PA are presented and broken down into zones in Section 5 of the full LLA report (also see below). Each zone highlights active pressures and risks associated with areas of the landscapes at a local scale, providing recommendations at this level on where to secure and manage wildlife corridors.
3. These recommendations are consolidated in Section 6, which summarizes the response to threats and suggests appropriate mitigation measures. Responses are classified into avoidance, minimization, restoration and monitoring measures.

Readers of the report are encouraged to view it as part of a wider LLA tool. In particular, users should reference the zone synthesis maps and recommendation tables, which illustrate a range of the outputs of the LLA for focal points of interest across the ZWW landscape. Complementary to the maps and recommendations, the output data products from all analyses are made available to stakeholders to explore via an interactive web map.

The LLA provides an assessment of current trends in the landscape, the threats driving them and recommendations on where conservation actions can be taken. With the combination of this report, the spatial datasets provided alongside and the suggested actions and approaches, the LLA represents a critical tool to support decision making and to guide future conservation actions in the ZWW landscape.

The topographical and hydrological analysis highlights the terrain relief and water system in the landscape (see Fig. 22).

Figure 22. Topographic map of the Ziama-Wonegizi-Wologizi landscape



The land cover analysis shows the different land cover classes across the landscape. The latest land cover analysis (2019) for the ZWW landscape shows that forest is the dominant land cover, occupying approximately 50% of the area, with almost a third (33%) occupied by dense canopy forest. The majority of the dense forest found in the landscape forms two large blocks of dense canopy. The easterly block is comprised of Ziama and Wonegizi, the westerly block comprises Wologizi and spreads southwest towards Foya. Whilst the two blocks are comprised predominantly of dense canopy, isolated areas of secondary, shrubland/fallowed land and exposed substrate classes do also occur within these blocks. These areas appear to correspond to sections of mountainous terrain and its associated cliff faces, outcrops and shallow soils.

A mosaic of land cover types can be found outside of the two large continuous dense forest blocks, dominated by active agriculture and shrubland/fallowed agriculture. These two classes contribute to just under half (46%) of the ZWW landscape. Fragments of forested land are found throughout the landscape but are small in number and size, and all are islets in the agricultural mosaic. Small areas of grassland and exposed substrate account for 4.16% of land cover. The most obvious land cover feature is the agricultural corridor, with its settlements and roads that separate Wonegizi (see Fig. 23) and Wologizi.

The land cover analysis shows that the agricultural mosaic occurs right up against areas of relatively unbroken forest, creating numerous sharp transitions. In some cases, agriculture occurs inside large continuous blocks of forest, creating islands of agriculture, often surrounding communities within the large forested areas. These islands are evident in Ziama and in the north of Wonegizi. Similar to the corridor between Wonegizi and Wologizi, networks of roads and tracks fragment the forest into distinct blocks.

Figure 23. Land cover map of the Wonegizi proposed protected area

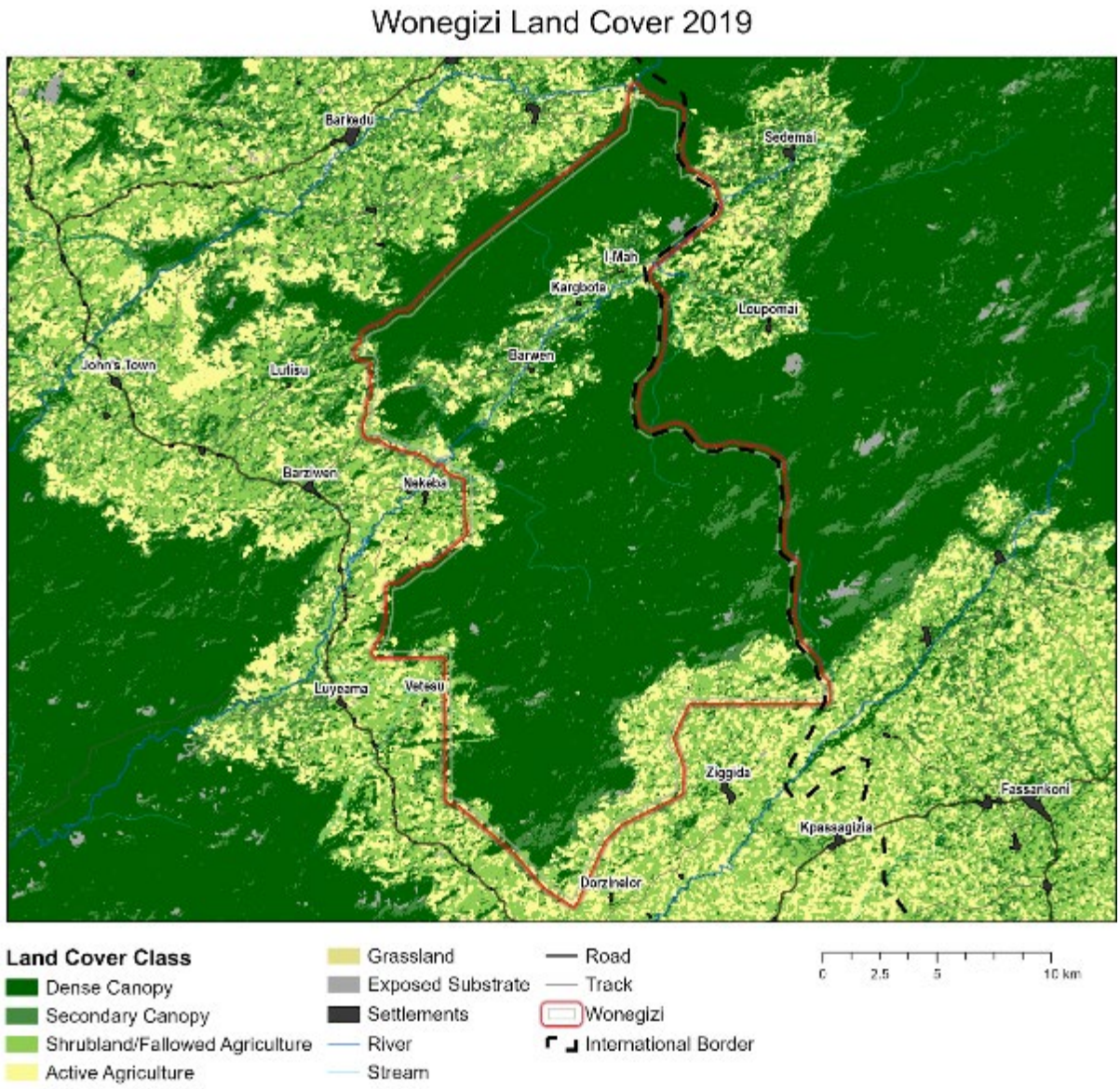


Table 6: Coverage of 2019 land cover classes across the Ziama-Wonegizi-Wologizi landscape

Land Cover Class	Area (km²)	Percentage of ZWW landscape
Dense Canopy	3377.8	32.9%
Secondary Forest	1511.0	14.7%
Shrubland/Fallowed Agriculture	2404.4	23.4%
Active Agriculture	2320.0	22.6%
Grassland	192.2	1.9%
Exposed Substrate	234.6	2.3%
Roads and Tracks	83.0	0.8%
Rivers and Streams	55.3	0.5%

Land Cover Class	Area (km²)	Percentage of ZWW landscape
Settlements	77.3	0.8%

The forest loss density map (Fig. 24) illustrates the intensity of forest loss occurrences since 2000. The gradient of intensity is represented on a scale from red to green, which ranges from high forest loss (red) to no forest loss (green).

The majority of the observed forest loss occurs within Liberia, with an obvious difference in land use change on either side of the international border. This can be seen when comparing forest loss around the settlements of Voinjama (Liberia) and Macenta (Guinea). High levels of forest loss are also apparent within the agricultural corridor that follows the road from Voinjama and Konia between Wonegizi and Wologizi.

There has been a general expansion of forest clearing in rural areas away from the larger urban settlements, and forest loss does not appear to be strongly correlated to the areas around the larger settlements. There is, however, a pattern of increasing forest loss within a buffer around roads outside the PAs.

Results correlate with the land cover assessment (Section 4.3) and reveal that the boundary of the Ziama PA is being well maintained, with low levels of recent encroachment within the boundaries. The three settlements incorporated within Ziama do not appear to be expanding their agricultural land significantly.

Conversely to the situation in Guinea, high levels of deforestation is encroaching the boundaries of both Wonegizi and Wologizi within Liberia. Minimal deforestation is apparent within the cores of these PAs, although there are small areas of loss surrounding Bedezebai, Wobeyamma and Karzah in Wologizi. Moderate levels of loss are found in Wonegizi throughout the developing cultivation corridor that links the Barwen, Kargbota and I-Mah settlements and extends to Soundédou in Guinea.

The forest loss statistics in Table 7 present the area of forest lost for each landscape over the land cover study periods between 2000 and 2019. Throughout the ZWW landscape, a total of 217 km² of forest cover was lost, which equates to 4.25% of the total forest in 2013. Both Wologizi and Wonegizi had higher percentage loss than the ZWW landscape average, with values of 4.48% and 6.82% respectively. This was compensated by the reduced forest loss in Ziama, at 1.43%.

Forest retreat maps included in the main report illustrate the patterns of forest loss in and around each PA/PPA over the last two decades.

The LLA observations suggest that the governance associated with natural resource management is much more robust in Guinea than it is in Liberia.

Figure 24. Forest loss density in the Ziama-Wonegizi-Wologizi landscape

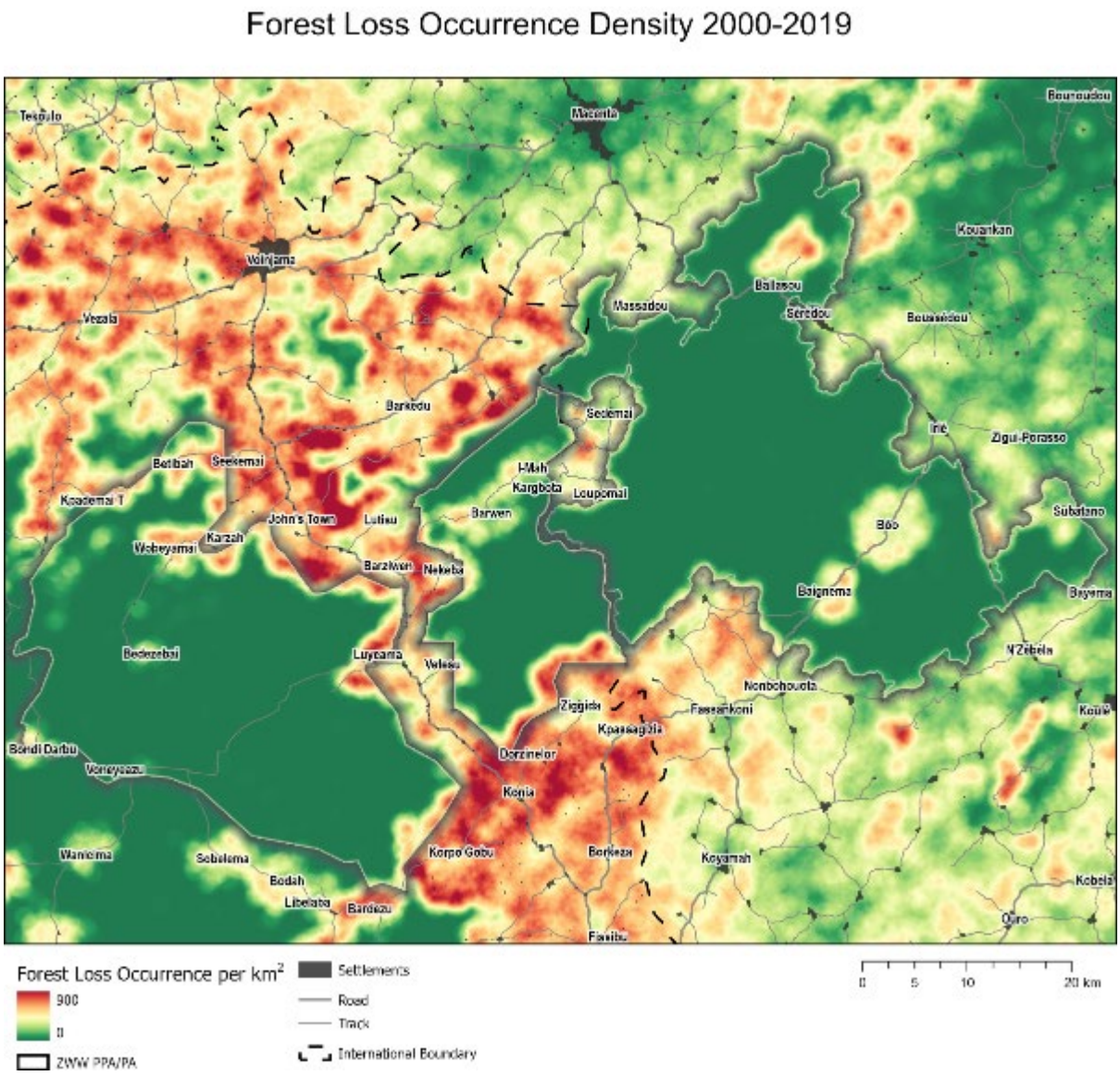
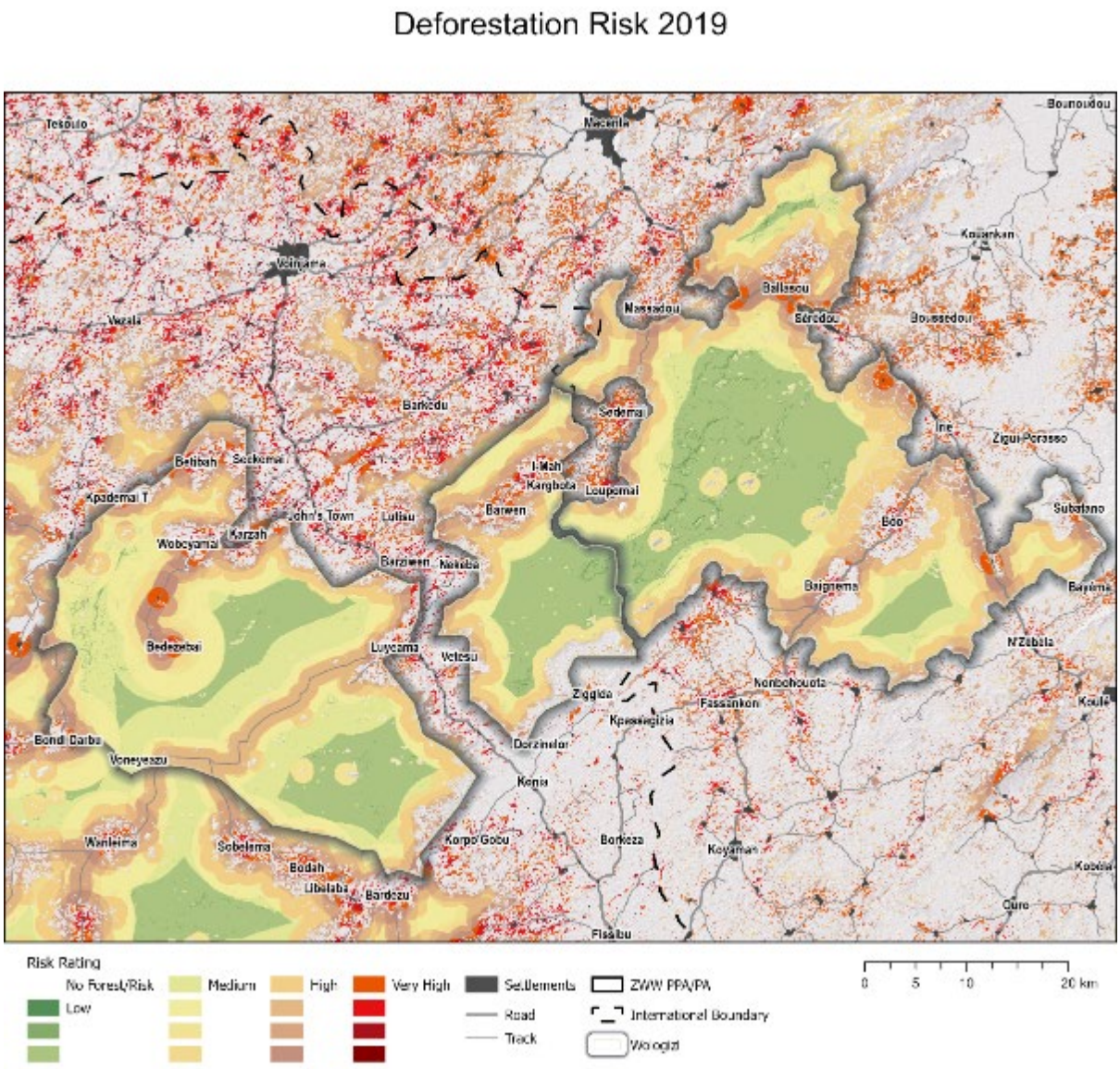


Table 7. Successive forest cover loss in the Ziama-Wonegizi-Wologizi landscape

Landscape	2000 Cover (km^2)	2013 Cover (km^2)	2019 Cover (km^2)	Forest Cover Loss (km^2)	Percentage Loss of Forest Cover
ZWW	8227.7	5106	4888.8	217.2	4.25%
Ziama	1163.4	1118	1102	16.0	1.43%
Wonegizi	354.8	325.6	303.4	22.2	6.82%
Wologizi	974.5	939.2	897.1	42.1	4.48%

The deforestation risk analysis reveals that Ziama holds the largest area of forest with low deforestation risk in the landscape, contributing to 30% of remaining forest in the PA (see Fig. 25). High and very high deforestation risk (37% and 3% respectively) contribute to 40% of Ziama's remaining forest cover and represent the largest areas in the ZWW PA network. Wonegizi also has 40% high- and very high-risk forest, and Wologizi 32%. The high- and very high-risk areas in all three PAs follow settlements and road corridors. Wologizi has a substantially lower percentage of low-risk forest than Ziama and Wonegizi (19%), which is found in two large blocks. Medium-risk forest contributes to nearly 50% of remaining Wologizi forest. Wonegizi holds the lowest area of low deforestation risk forest (106 km^2), but the highest percentage risk of all three PAs (35%).

Figure 25. Deforestation risk analysis for the Ziama-Wonegizi-Wologizi landscape



The results of the connectivity analysis highlight areas important for maintaining both structural and functional connectivity. Using the core areas produced by the analysis, a connectivity corridor analysis was performed to highlight areas of structural connectivity (forest-to-forest distance). Functional connectivity core areas were determined by identifying areas of low resistance (applying a threshold of the lowest 15%) to the habitat resistance values. Relative resistance values between zero (representing no resistance to movement) and one (impassable for species) were calculated for variables based on mean values of independent surveys of biodiversity experts working in the field. Connectivity bottlenecks were derived from the connectivity modelling software (see Fig. 26). Bottlenecks represent areas of connectivity where flow is restricted and, if lost, would have a disproportionate effect on connectivity. Bottlenecks are often used to represent areas where connectivity should be protected and potentially restored.

Some forest cores (see Fig. 27) are only separated by tiny perforations where roads are present; for example, the central forest in Ziama (Core 3) and northwest of Ballasou (Core 5). However, in some cases the gaps between forest core is sizeable; for example, the settlement corridor between Wonegizi (Cores 6 and 7) and Wologizi (Cores 8 and 9).

Figure 26. Structural forest bottlenecks in the Ziama-Wonegizi-Wologizi landscape

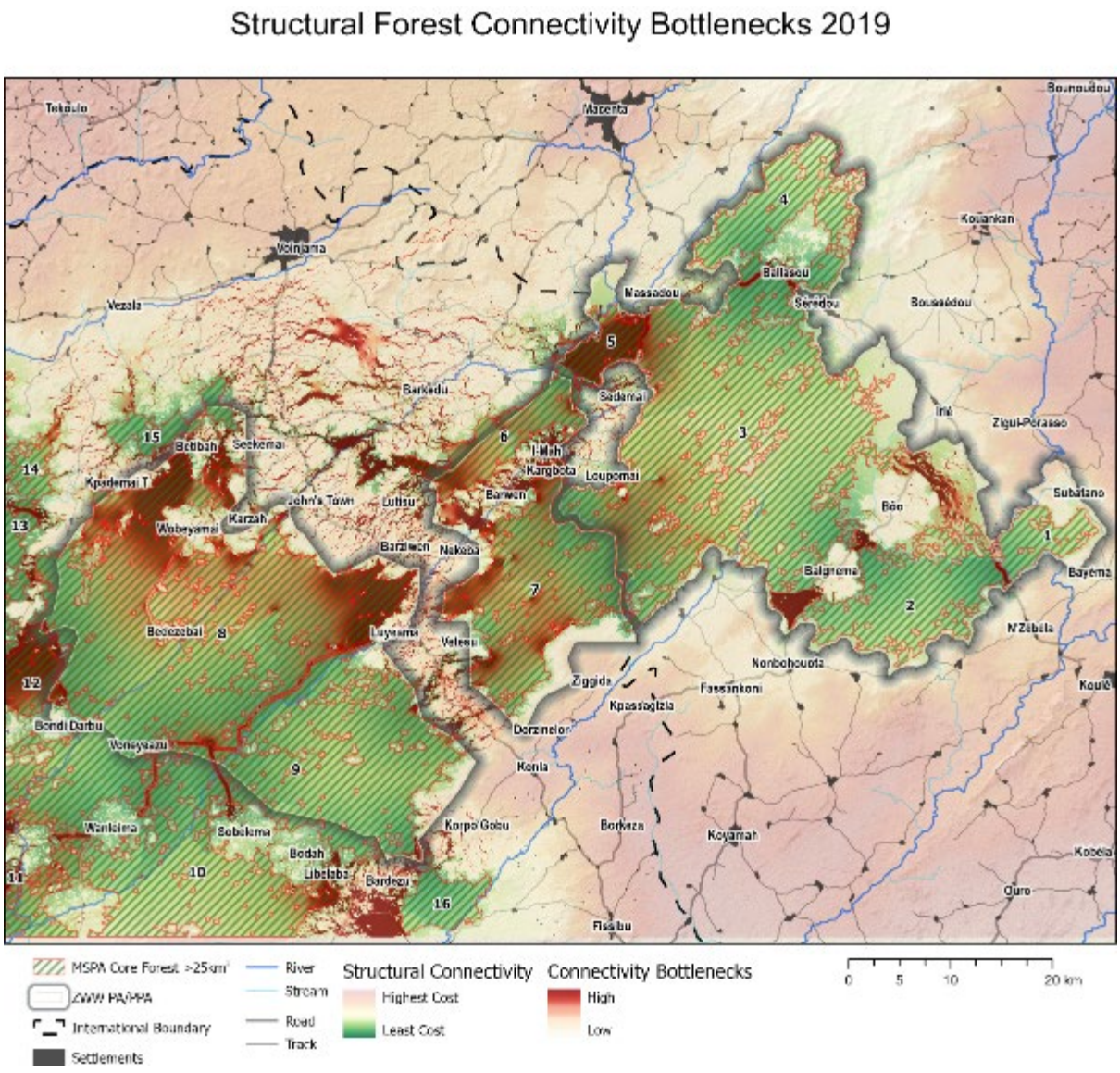
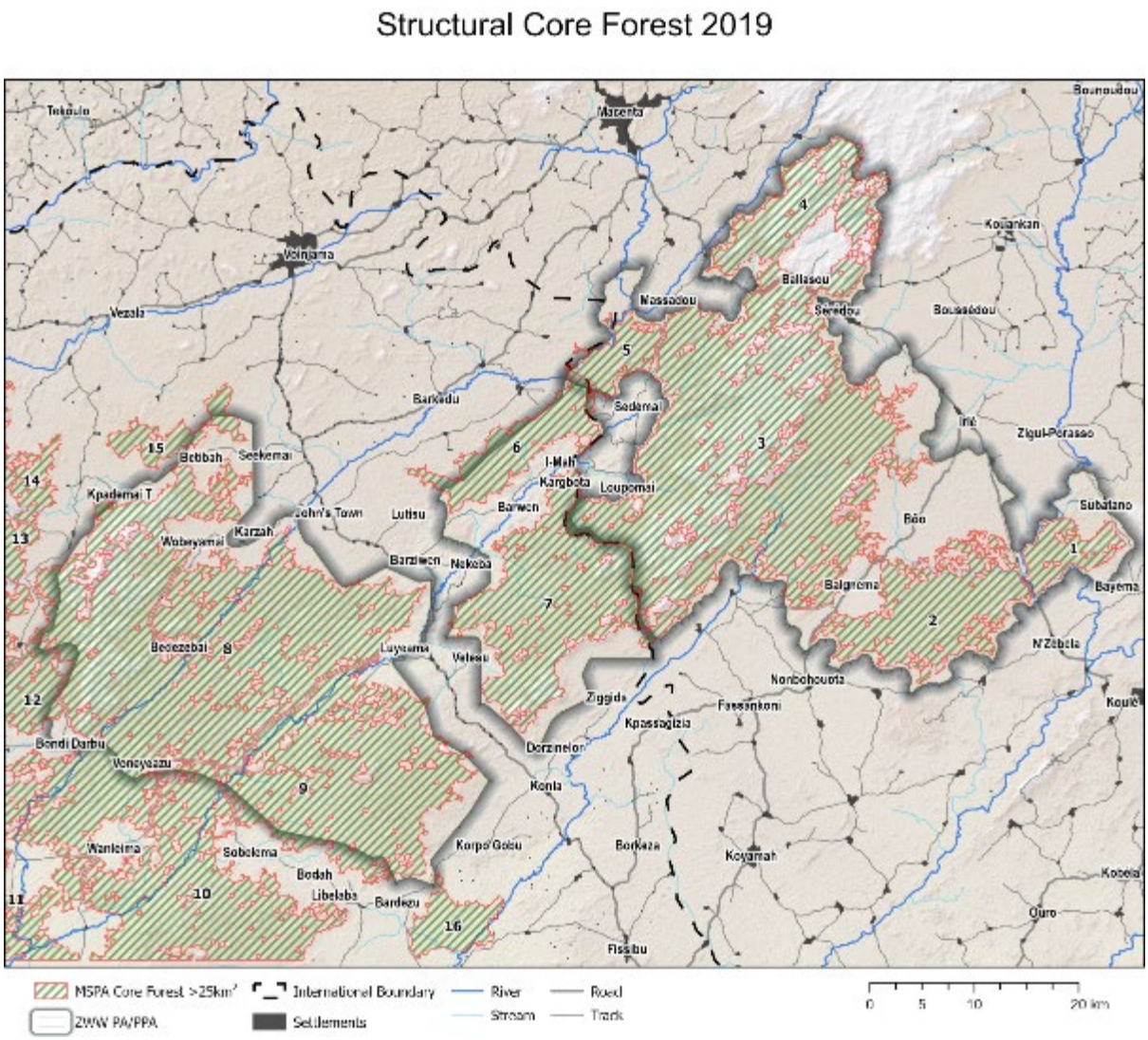


Figure 27. Structural core forest in the Ziama-Wonegizi-Wologizi landscape



Site-specific recommendations for the various PAs are provided in the main report. These recommendations are summarized into a list of key actions for the ZWW landscape in Table 8, classified into avoidance, minimization, restoration and monitoring measures. Whilst highlighting geographically explicit areas of concern, site-specific recommendations are inherently at a high level; the challenge is to find strategic synergies and link these to appropriate means to enact the recommendations on the ground. Table 8 therefore includes suggested implementation approaches for key recommendations. Recommendations and suggested implementation should be viewed in the context of the current socio-political and environmental situation on the ground. This is not an exhaustive list, as some recommendations may not be relevant or may already be implemented throughout parts of the landscape in current conservation activities. It is therefore acknowledged that proposed actions and approaches should be tailored to specific situations and actors in each locality.

Table 8. Summary of key recommendations and suggested approaches for their implementation

Recommended Action	Suggested Implementation Approaches
Avoidance Measures	
Implement measures to protect remaining intact forest and associated biodiversity	• Review or develop protected area (PA) management plans in light of corridor connectivity issues highlighted by the landscape level assessment (LLA); • Support the development of alternative livelihoods that improve agricultural production and productivity of soils, thereby preventing slash-and-burn agricultural practices that encroach on forested areas; • Disseminate information to communities on relevant rules and laws surrounding habitat disturbance/destruction in the PAs/proposed protected areas (PPA); • Implement mobile anti-poaching and deforestation patrols, and target high-risk areas identified in the LLA in particular; • Demarcate non-gazetted PA boundaries accurately; • Close roads and tracks providing unnecessary/unauthorized access to forest areas; • Capacity development of forestry and conservation authorities (recruitment, training and equipment); and • Engagement with extractive industries in the landscape to support protection efforts.
Prevent further agricultural encroachment and degradation into forested areas	• Engagement with communities, their leaders and local authorities to: – Support local awareness-raising activities on the importance of forests and the services they provide; and – Support the development of alternative livelihoods that improve agricultural production and productivity of soils, thereby preventing slash-and-burn agricultural practices that encroach on forested areas. • Engage and collaborate with extractive industries to assess their impacts and develop actions that reduce and alleviate adverse impacts; and • Encourage participation of local celebrities in forest conservation programs.
Minimization Measures	
Consolidate agricultural practices and extraction of forest products	• Develop village land use/social forestry plans with involvement of forestry and conservation authorities; • Support the development of alternative livelihoods that improve agricultural production and productivity of soils, thereby preventing slash-and-burn agricultural practices that encroach on forested areas; • Support local community development programs (such as health, education and livelihood development); • Establish law enforcement check points along roads to control the illegal movement and circulation of weapons, hunting products, bushmeat, illegally trafficked wildlife and illegally extracted timber; • Support local awareness-building activities on the importance of forests and the services they provide; • Where appropriate, develop and implement resettlement plans in close collaboration with communities, their leaders and local authorities;

Recommended Action	Suggested Implementation Approaches
	• Disseminate information on relevant legislation concerning agricultural practices and land rights; and • Apply forest smart mining principles.
Prevent further development of roads in forested areas	• Engagement with communities, their leaders and local authorities; and • Maintain existing roads, bridges and drainage systems to avoid the need for new roads.
Restoration Measures	
Build ecological connectivity through restoring forest on degraded forest and fallow agricultural land	• Compile local master plans for improving connectivity based on further investigation of identified structural and functional connectivity corridors; • Develop village land use/social forestry plans with involvement of forestry and conservation authorities; • Empowerment of local communities to manage their own natural resources through development of community-based natural resource management programs; • Establish women-empowerment programs related to natural resource management; and • Support village natural resource management committees.
Consolidate or relocate communities involved in isolated cultivation within the forest	• Develop and implement PA management plans in collaboration with local authorities; • Secure funding for resettlement; and • Develop and implement resettlement plans in close collaboration with communities, their leaders and local authorities.
Monitoring Measures	
Monitor encroachment into forest edges	• Ecological monitoring of encroachment into forest boundaries by forestry and conservation authorities; • Implementation of participatory systems and empowerment of local communities to monitor their own natural resources; • Develop collaboration with research and conservation organizations for spatial analysis support and capacity building, in particular remote sensing projects to monitor forest loss and encroachment; and • Use available technology such as the GLAD alert system hosted by Global Forest Watch to monitor deforestation.
Monitor degradation within remaining forest.	• Conduct ecological studies that describe the ecological state of habitats and monitor key indicators for change.
Investigate/Monitor ecological connectivity	• Conduct ecological studies in natural areas that include baseline assessments and the monitoring of movement/habitat use of priority wildlife (such as use of camera traps and tracking); and • Collaborate with and involve research institutions for technical guidance and capacity building.

The outputs of the LLA—report, supporting geodatabase and the web map—should be considered an important decision-making tool that forms part of a wider strategic planning process that is guided by the relevant authorities with input from stakeholders.

Through the collection and collation of biophysical, biodiversity, land use and potential development scenarios, the LLA has generated multiple spatially explicit analyses for the landscape. However, it is important to note that for a holistic approach to landscape level management and biodiversity conservation, it is imperative that decision makers see the LLA as the foundation of ongoing efforts

to improve their understanding of the ZWW landscape, and therefore evaluate the combined effects/value of these data across the landscape with new and emerging best available evidence. The LLA should not be considered a static product. Datasets and methodologies used and generated in the LLA will be provided to the funder. Robust methodologies incorporating mostly freely available open source data were used to enable long-term continuity, accessibility, improvement and ongoing benefit to conservation.

The LLA database and web platform ultimately needs to be accessed by—if not owned, hosted and updated by—the governments of Liberia and Guinea and be made available for use by the widest range of stakeholders possible, empowering them to assist in the future planning, development and management of biodiversity, and to support the sustainable planning and management of land uses at a landscape level. The value of the LLA datasets in enabling informed decision making around identifying and managing priority areas for conservation across the landscape is significant, but much of this worth is contingent on their widespread access and uptake as decision-making tools and a commitment to building on them as a platform.

The LLA provides the basis on which decisions relating to biodiversity monitoring, risk assessment, resources management and conservation are made, and it provides the information needed to stimulate responses by the responsible stakeholders in the ZWW landscape. These include organizations and experts in partnership with government decision makers, NGOs and private companies. Furthermore, this LLA provides the outputs that will help to efficiently communicate the pressures and state of biodiversity and ecosystems in the landscape to inform a broad audience. It is clear from this report that significant change is taking place in the ZWW landscape and that it needs urgent and focused attention in terms of both interventions and monitoring.

1.4.2: Develop strategies to secure and manage migration corridors across the ZWW landscape (see 1.4.1)

Following completion of the LLA in early March 2020, a remote presentation (due to COVID-19 travel restrictions) was given by Sam Gregory to stakeholders in Monrovia. The aim of the presentation was to share findings and propose strategies to secure and manage migration corridors across the ZWW landscape with stakeholders and policy makers. A total of 35 people, including representatives from the FDA, Ministry of Internal Affairs, UL, National Union of Community Forest Management Bodies and NGOs attended the event. A similar presentation will be made to Guinean authorities once the report and presentation are translated into French.

3.1.5 ACTIVITY 1.5: SUPPORT FOR ZIAMA, WONEGIZI, WOLOGIZI PROTECTION INITIATIVES

1.5.1: Enable Ziama to function as a man and biosphere reserve

Consultant Alan Deverell arrived in Guinea in October to support the CFZ in the updating of Ziama forest rules in line with MAB regulations and national laws. The discussions between FFI, the CFZ and the United Nations Office for Project Services (UNOPS) are continuing to move the process forward. An integrated work plan has been created as a result of the coordination meeting in N'Zerekore at the Guinea launch in October to ensure CFZ/FFI/Mano River Union (MRU)/UNOPS activities are coordinated.

Meetings were held with the senior management of the CFZ to discuss approaches to managing Ziama as an effective MAB Reserve. CFZ staff have been provided with information on standard approaches recommended by the United Nations Education, Scientific and Cultural Organization (UNESCO) and the responsibilities of the management team outlined.

Consultation meetings were held with UNOPS in Sérédou for the planning and organization of an information workshop in February for CFZ staff on the definitions of a MAB. It has become obvious that CFZ staff have very limited knowledge of the MAB development process, its requirements, their obligations and the rights of local residents. It is essential that this is well understood before initiating

consultations with communities. A short workshop was organized in January (in collaboration with UNOPS) on the MAB process and explanation of the roles and responsibilities of the different parties. The new legal code (Code de la Faune) promulgated on October 18, 2018 was also presented. This was attended by senior staff from CFZ HQ as well as park wardens and their deputies from the different sites under the management of the CFZ. There were a total of 23 participants.

The printing and binding of 100 copies of the new wildlife laws (Code de la Faune) promulgated in October 2018 was completed in February, and the copies are in the process of being distributed to local authorities and community leaders. This will also be an important element of the proposed consultation workshop with communities where the impact of the new laws on communities will be discussed.

A 2-day community consultation workshop was held at the Ecole d'Administration in Sérédou on June 7th and 8th to present the concept of Ziama as a MAB and to begin the process of drawing up a general management plan for representatives of the communities in the transition zone. This included a consultation process around the question of resource use in the buffer zone as well as the procedures for implementing community conservation committees in each of the villages. The meeting was attended by 152 villagers (of which 22 were women) from communities in the Ziama MAB transition zone as well as local and regional officials. The workshop was co-sponsored by UNOPS and is an important step in the drawing up of the Ziama general management plan. Ninety copies of the new wildlife and hunting laws have been distributed to local authorities, elected officials and communities to promote a better understanding of the rights and responsibilities. FFI was part of the planning meeting in July to analyze the ToRs for the establishment of community conservation committees in 32 villages around Ziama.

A committee was also set up for a first reading of the revised Ziama management plan by the director of the CFZ, with the support of UNOPS. FFI provided technical and financial support for the organization of the Ziama Management Plan Validation Workshop in Conakry, led by UNOPS. The FFI Guinea interim project manager and ZWW project manager attended the meeting. Support for a Liberian delegation to participate was also provided, including Hon. Abraham Korvah (deputy minister of foreign affairs), Hon. Mariamu Fofana (District 4 law maker), Hon. William Tamba Kamba Sr. (Lofa County superintendent), Christiana Wahblo (desk officer, international cooperation and economic affairs, Ministry of Foreign Affairs), James Tarnue (Zeama Clan chief), James Korboi (Wologizi communities) and Tarnue Mulbah (chairman, Forest Monitoring Committee). Presentations at the meeting included information about Ziama, the results of the integrated management effectiveness tool and a summary of the management plan (vision, mission, main activities and 5-year budget).

Figure 28. Hon. Abraham Korvah giving remarks at the validation meeting for the revised Ziama management plan

Next steps and recommendations included: implement the management plan as soon as possible in order for the Ziama MAB to be removed from the list of World Heritage Sites in danger; translate the management plan into English to assist transboundary management collaboration; development of a business plan as a priority to access resources, communicate to the minister about the implementation of the management plan and its application to other PAs in Guinea; request support from stakeholders for the development of the business plan; recruitment of personnel; request technical and financial partners to mobilize resources for implementation; and request this initiative be extended to Nimba and other PAs in Guinea. The 5-year budget is estimated at around US$ 8.5 million. Participants provided feedback at the meeting, and the management plan was successfully validated. The Guinean government formally endorsed the document in November 2019.

Following the adoption of the revised management plan, the CFZ organized a series of community meetings in February 2020 to present the plan and provide an update on the signing of the ZWW bilateral framework agreement. The revised management plan is notable as this is the first time a co-management approach has been considered for a PA in Guinea. Such a strategy has implications for Section 2.2, which talks about sustainable management and biodiversity conservation. It is also the first time that Ziama has had a transition zone where development activities will be focused.

March 2020 saw the CFZ carry out public awareness focused on the wildlife and forest codes in 32 communities around Ziama. Continuing with a focus on the law, the CFZ held a meeting with judicial police, judiciary officers and agents to understand how legal standards such as the penal code and criminal procedure code support the implementation of the forestry code, wildlife protection code and hunting regulations. The outcome of the meeting was an improved understanding of the aforementioned legal instruments and due process. This in turn will assist the CFZ and police to support each other in ensuring the correct procedures are followed and the law used effectively to address wildlife crime in the Ziama MAB.

1.5.2: Support Forestry Development Authority with data and other information to promote protected area status of Wonegizi

Wonegizi gazettement

FDA comments on the draft gazettement package for Wonegizi have been addressed, and the document is being finalized. The draft package recommends that Wonegizi become a multiple sustainable use reserve (IUCN category VI: PA with sustainable use of natural resources).

Intensive field work to complete the boundary flagging and harmonization has been ongoing under NORAD, and 12 out of 13 communities have completed the harmonization process at the time of writing.

Prof. John Woods (consultant) was contracted to support FFI and the FDA to commence the process of the gazettement of Wonegizi as a multi-use reserve. This has involved engaging with and creating awareness among national-level stakeholders, particularly the legislature, on the need for the gazettement of Wonegizi, and to lobby for the passing of the Wonegizi gazettement bill.

County, district and community-level stakeholder workshops in relation to the gazettement of Wonegizi were initially planned with the FDA REDD+ national coordinator and Conservation Department for January 2019. A 60-day notice of intent was signed by the FDA managing director and distributed at the county, district and community levels in November 2018 (under NORAD). The notice was also shared at the national level over radio. However, during the planning process it became clear that there was an inconsistency in the Land Rights Act (LRA) (2018) with regard to the status of PPAs, which made it impossible to move forward with the consultations until clarity had been sought from both the FDA and Liberia Land Authority.

A meeting to address the issue was held at the end of January 2019 and attended by Saah David (REDD+ national coordinator, FDA), Cllr. Kula Jackson (commissioner for land policy and planning, Liberia Land Authority), Cllr. Negbalee Warner (dean of law, UL/managing partner, Heritage Partners & Associates [HPA]), Prof. John T. Woods (associate dean of forestry, UL, and former FDA managing director) as well as other members from the FDA and FFI team.

Cllr. Negbalee Warner guided the participants' discussion, starting with recognizing the main issue with reference to the LRA 2018. He referred to two conflicting sections in the LRA: Article 2, which states that all PAs and PPAs are government land; and Article 42, which states that all land recognized by the FDA as PAs prior to the passage of the LRA shall remain PAs within government land, but other land not yet designated as PAs (i.e., PPAs) will be a subject of negotiation with the communities.

Participants went on to discuss the potential implications of the conflicting clauses in relation to the Wonegizi gazettement process. The discussion led to the consensus that the FDA and Liberia Land Authority will jointly sign a letter confirming that they recognize the potentially different interpretation of the law, but also recognize provisions of other applicable laws and are willing to proceed. The law will need to be refined, but this will take a long time. On this basis, they are satisfied to advise FFI to proceed with consultations as part of the process of establishing PAs, including full consultation with the community as stipulated in the Wildlife Conservation and Protected Area Management Law 2016 and all other aspects as per the applicable laws.

As such, between February and March 2019, FFI supported the FDA in the planning of community consultations. Seven planning meetings were held between February 28th and March 29th, facilitated by FFI. During these meetings, a number of documents were produced, including a protocol for the community consultations, an agenda for community meetings and suggested content of community consultations, including PowerPoint (PPT) presentations, to be made during consultations. Institutions and individuals who participated in these meetings included consultant John Woods and his team, the FDA, FFI, Skills and Agricultural Development Services (SADS), Liberia Land Authority and the Sustainable Development Institute (SDI). The aforementioned will serve as facilitators and third-party support to communities based on the Free, Prior and Informed Consent (FPIC) process.

Community consultations for the gazettement of Wonegizi were completed April 6–19, 2019 in the 13 communities, as well as five cluster meetings. The team comprised representatives from FFI, SADS, SDI, Liberia Land Authority, Environmental Protection Agency (EPA) and FDA, as well as the representative of the national consultant. The team did the first consultation in Ziggida and then split into two to consult the remaining 12 communities. The consultations involved a series of presentations and question and answer sessions focused on the following: the FPIC process, community consultation process, overview of the PA gazettement process, Wonegizi background information, benefits of the REDD+ project, stakeholder engagement to date, the boundary demarcation process and the LRA. Each community received a copy of the summarized draft gazettement proposal, copies of the LRA, the National Forestry Reform Law, the 2016 Wildlife Conservation and Protected Area Management Law, a map of Wonegizi and protected species posters and flyers.

The consultant for the national-level engagement for the gazettement, Prof. John Woods, has also made good progress in engagement with high-level government and citizens of Lofa County, including the chair of the Lofa County Legislative Caucus. As part of awareness creation about Wonegizi, a PPT on background information on Wonegizi was shared in April 2019 with Lofa County Legislative Caucus members, along with an introductory letter. The SDI completed follow-up meetings in May 2019 with the 13 communities in Wonegizi. The SDI is acting as a neutral body (third party) to ensure the communities understand the information provided during the consultations in April (as part of the FPIC process for gazettement). The information gathered by the SDI will assist to focus the second round of community consultations. A cluster community assessment was conducted for 52 communities in Wonegizi as part of the gazettement process and finished in July 2019. Findings from the assessment have resulted in an additional four communities added as project beneficiaries, making the total number of target (primary) communities 17.

The FFI country manager, REDD+ project manager and ZWW project manager attended the REDD Technical Working Group High-Level Policy Roundtable Workshop in Ganta August 28–30, 2019. The workshop was attended by several government officials, including the FDA managing director, FDA deputy managing director of operations, FDA board chair, FDA REDD Implementation Unit staff, Liberia Land Authority chairman, county superintendents and representatives from community, civil society, conservation and development NGOs. The general objective of the policy roundtable was to facilitate information sharing among high-level policy makers on the status of REDD in Liberia. Policy makers in attendance were the House and Senate Committees on Natural Resource Management and Agriculture (including those with oversight for climate change, environment, forestry and land use) and strategic cabinet ministers and heads of agencies, including Finance and Development Planning, Agriculture, Forestry, Environment, Mines and Energy etc. Specific objectives of the workshop were to:

- Present an overview and current status of progress in Liberia REDD+ preparedness;
- Facilitate review of issues affecting/or enhancing the implementation of REDD+;
- Enhance policy makers' understanding (knowledge/orientation) of REDD+ and its financing mechanisms (including accessing of carbon funds);
- Enable policy makers to identify ways they can foster high-level political buy-in and support in ensuring Liberia's accesses to necessary carbon funds for driving REDD+ agenda;
- Bring them up to speed with the status of implementation of Liberia's REDD+ strategy, including progress and challenges;
- Facilitate review of the role these policy makers need to play in advancing Liberia REDD+ strategy, including articulating policy reforms and accessing carbon financing for helping Liberia implement REDD+;

- Facilitate review of REDD+ approaches and the role of the National Climate Change Steering Committee;
- Facilitate review of the role of the national legislature in REDD+ implementation; and
- Facilitate the drawing up of a roadmap going forward.

FFI attended the follow-up meeting organized by the EPA on September 13–14, 2019 at the Farmington Hotel in Margibi County to engage senators and law makers on REDD. Joseph Flomo (FFI project officer) presented achievements to date of the Wonegizi REDD+ pilot project. The meeting was very positive, with a number of senior-level government representatives expressing their support for the REDD approach. The meeting also underlined the need for NGOs, the EPA and FDA to continue lobbying government to increase understanding and support for conservation in Liberia. It was pointed out by one participant that Liberia's annual budget is just over US$ 5 million, so an opportunity to generate additional and sustainable income for the country by conserving Liberia's forests is most welcome.

An EPA approved independent consultant was hired in December 2019 to conduct an environmental and social impact assessment (ESIA) per EPA requirements for the gazettement of Wonegizi. The ESIA report was submitted in January 2020, and a stakeholder validation meeting was held in February 2020. The report has now been approved, and both the EPA and FDA are engaging on the process of finalizing the ESIA permit. However, at the time of writing this report the permit has not been issued. In the meantime, the draft gazettement package was submitted to the FDA for review. The FDA's comments were forwarded to the consultant in February for incorporation into the package. The comments have been addressed, and the gazettement package is now being finalized.

Further community consultations were held in March 2020. These meetings were intended to resolve all outstanding issues raised by the Wonegizi communities with respect to gazettement of the Wonegizi PPA. It also provided an opportunity for the Wonegizi communities to interact directly with high-level officials of the county, as listed below.

- Representative of District 4 (Quardu-Gboni)—Hon. Mariamu B. Fofana;
- Representative of District 5 (Zorzor)—Hon. Beyan Howard, who was represented by Mr. Yanquoi;
- County superintendent—Hon. William Tamba Kamba;
- District commissioner of Zorzor—Hon. Joseph Bedel;
- Voinjama—Hon. Albert Zalee;
- Deputy managing director of the FDA—Mr. Joseph Tally; and
- FDA technical manager of conservation—Mr. Blamah Goll, just to name a few.

In attendance from FFI were country manager Dr. Mary Molokwu-Odozi, Wonegizi REDD+ project manager Bose Kosemani, livelihood and governance coordinator Abednego Mehn and Wonegizi project officer Joseph Flomo.

The Wonegizi communities were arranged into four clusters to ensure that all communities are represented and their issues adequately presented by their respective town leadership.

Concerns from the communities focused on the demarcation, additional farmland, development and access to resources and sacred sites. The team emphasized that Wonegizi is intended to be a multi-use reserve and that there will be zones for various livelihood activities, including controlled fishing and NTFP collection etc. Sacred forest will be maintained in its position in the forest, and cultural practices such as poro and sandi will be permitted since they do not destroy the forest. Activities

allowed/not allowed in the proposed reserve are listed in a messaging document to communities, which was distributed to communities during a subsequent visit.

Rep. Mariamu Fofana and Lofa County superintendent William Tamba Kamba pointed out that the FDA, FFI and partners should live up to their commitments and provide adequate sustainable livelihood opportunities. Following the meetings, most of the communities agreed that the existing demarcation will remain. Two communities (Barwen and Tusu) informed the team that they would meet internally to deliberate and get back. Further details of the meetings can be found in the summary report.

Regulations to implement the 2016 National Wildlife Conservation and Protected Area Management Law

Under the auspices of the LESC, the National Wildlife Conservation and Protected Area Management Law is being revised to bring it in line with CITES. The revision is led by Conservation International and the international law firm DLA Piper, supported by LESC partners including FFI. As part of this work and in providing a guide to facilitate proper implementation of the law, FFI contracted lawyers at HPA to develop regulations for the wildlife management section of the law and compile a list of regulations under the Wildlife Conservation and Protected Area Management Law. The wildlife management regulations for the 2016 law will help the FDA to operationalize its activities linked to the implementation of the law, but also serve as a tool in supporting conservation awareness raising in relation to the management of wildlife in Liberia.

A final draft of the regulations prepared by HPA, "Wildlife Conservation and Protection Regulation 2020," has been submitted to the LESC after several revisions and inputs from the LESC to ensure they are in line with the revised law.

1.5.3: Support transboundary protection and law enforcement

A learning exchange visit was organized in January 2019, whereby the chief park warden of Wonegizi and three rangers met with the chief antenna of Ziama and 15 CFZ rangers. The following is a summary of the report on the learning exchange visit by Seny Koivoigui (CFZ ranger), translated from French into English.

Following the formal welcome of the Wonegizi park staff, they were introduced to the FFI Guinea office and the office of the Sub-Prefecture of Sérédou.

The Ziama and Wonegizi guards made presentations to each other about their way of working, how they conduct patrols in the forest, their experiences and challenges. For a number of activities, the rangers found they carried out their duties in a similar way, with slight differences in the number of people, the team's disposition on the ground and the investigation and arrest of suspects (Koivogui, 2019). Following discussions, all the guards agreed that patrols require camping. Questions and answers focused on the case of the Ziama elephants, methods of discharge, compensation of crops and the payment of exit premiums by the state. The different responses indicate that the situation is the same in both countries. On the threat of elephants, the problem of a well-known elephant poacher who goes by the name "Zaou," now thought to be located in Liberia, was raised. The guards of Wonegizi promised to help capture and make Zaou available to the Guinean authority, whose activities threaten the conservation and protection of elephants in the three forests of Ziama, Wonegizi and Wologizi.

Figure 29. Ranger discussions (left); practical sessions at the learning exchange meeting in Sérédou (right)

Following the various speakers on both sides on the exchange of experiences and ideas in the context of the conservation of the Ziama and Wonegizi forests, it is recommended that a reciprocal visit from the guards of Ziama to Wonegizi is arranged for the reinforcement of technical capacity and effective transboundary management.

1.5.4: Conduct learning exchange visits with other successfully managed protected areas within West Africa

Gola Rainforest National Park, Sierra Leone

George Allison, the ZWW biodiversity officer, and other FFI staff and an intern (under the Tai-Grebo-Krahn-Sapo [TGKS] grant) took part in a 1-week learning exchange visit to GRNP in March 2019. The team met with the GRNP operation and management team in Kenema and visited Lalehun to meet with rangers. They also visited the Sileti research station. Key information was gathered about the GRNP patrol strategy and the plans and commitment they have with police, military and communities, all of which are actively in place to support park operation activities. The exchange was very helpful. Being a transboundary area, it gave invaluable insight into transboundary law enforcement operations, which would help guide the training of FDA Wonegizi rangers.

A second learning exchange trip to GRNP took place in May 2019, this time for Wonegizi rangers and FFI staff. This site was selected on the basis that it is a REDD+ site (the first in West Africa) and an established transboundary park. The WPPA is currently in the process of being gazetted as a formal PA and is also working towards validation as a REDD+ site. Therefore, this activity provided an excellent opportunity for Wonegizi staff to visit an established REDD+ site and see for themselves how REDD+ is benefiting local communities whilst achieving conservation objectives. The team visited the research center in Lalehun to meet with communities benefiting from REDD (VSLA groups and cocoa farmers).

In addition, wildlife crime is a serious challenge in MRU countries, and transboundary collaboration is vital if it is to be addressed effectively. As a follow up to the previous visit, the team met with GRNP staff at the headquarters in Kenema to learn about park operations. It provided an opportunity for Wonegizi and GRNP rangers to share and discuss park operations and law enforcement strategies and exchange ideas for improvement at their respective sites. Seven FDA staff members participated in the exchange: deputy manager for PAs Jallah Johnson, Wonegizi chief park warden John Flomoh, three zone wardens, and park biologist and FDA biologist seconded to FFI Menladi Lormie. Two FFI personnel, Philip Tem Dia (biodiversity technical specialist, ZWW) and Abednego Mehn (livelihoods and governance officer) also participated in the visit.

Recommendations from the law enforcement session include:

1. Volunteers/community auxiliaries in Liberia to be provided with actual ranger training;
2. Sierra Leone and Liberia to establish transboundary collaboration similar to the one between Liberia and Guinea for the ZWW Transboundary Forest Landscape; and
3. Provide incentives for arresting officer to avoid bribery.

GRNP staff provided copies of their law enforcement standard operating procedures (SOP), datasheets and a copy of the MoU between park management and the armed police for joint patrols.

To conclude, the team agreed that considering similarities in landscape between Sierra Leone and Liberia and the learning exchange visit to GRNP were exciting and useful experiences for participants from both countries. All participants from Liberia were impressed by the livelihood activities in GRNP communities and commented on how balancing conservation with improvement in livelihood is key. Further details can be found in the report.

Figure 30. Knowledge exchange participants with Gola Forest communities, Sierra Leone

(Photo courtesy of A. Mehn)

Taï National Park

Plans for the directrice of the CFZ and colleagues to go to Rwanda on a learning exchange visit were cancelled due to no response to emails from staff at the Volcans Reserve. As an alternative, FFI facilitated a trip to Taï National Park in Côte d'Ivoire in May. The site was deemed appropriate, as it is an established transboundary site located within the West Africa region. The learning exchange visit included four senior staff from the CFZ and three FFI project personnel. The visit included presentations on the two reserves, an evaluation of the different approaches, consultations with the different department heads, visits to three communities and a forest hike. The Office Ivorien des Parcs et Reserves (OIPR) also generously provided a quantity of reference material for the CFZ (copies of the management plan, CDs and environmental education picture boxes). The main recommendation from the exchange is that it is important to strengthen this cooperation and to consider sending rangers from Ziama for exchange visits to learn best practices from their Ivorian colleagues. Below is an extract from the report regarding lessons learned:

In light of the various interviews with the managers and visits to Taï Park, the main lessons learned are as follows:

- *The professionalism of the staff. The mission found that the park managers, whether supervisory or field staff, have all received training specific to their missions. Thus, it should be noted that the director and the sector chiefs who make up the management team are all trained forest engineers and at the same time uniformed officers of the Water and Forestry Corps; the surveillance staff are made up of forest rangers who have received commando training in a specialized center in addition to the basic common training of the Corps des Eaux et Forêts, the equivalent of the Guinean Corps of Nature Conservators; the heads of the Community Measures, Communication, Monitoring and Evaluation and Ecological Monitoring Departments have also benefited from specific training in their fields.*

- *The regularity in the update of the Statute of the park. All the phases of the park's evolution have been the subject of regular updates to the regulatory and legal documents (maps, decrees and orders...), the elaboration and respect of the development and management plans.*

- *The existence of an innovative financing method. Initially, the main donor for the operation of the park was Kreditanstalt fur Wiederaufbau, as in the CFZ. However, the park's autonomy was backed up by a foundation, which continues to finance its operations through the interest generated by a fund placed in banks for this purpose. This now makes it possible to finance the management activities contained in the management plan. It should be noted that all operating costs, including the various incentive bonuses, are borne by this fund with the exception of the salaries of the civil servant staff paid by the Ivorian State.*

- *The adherence of certain categories of residents to the spirit of park conservation. This is the case of some cooperatives and NGOs that benefit from certification and/or support from donors interested in conservation. This is the result of IEC (Information, Education and Communication) activities and accompanying community measures.*

- *The support of the park manager by local authorities demonstrated during meetings with local residents.*

- *Rigorous implementation of protection measures. This is reflected in the regular maintenance of the park's boundary (cleaning twice a year) with demarcation and progressive planting of rubber trees all around; regular organization of surveillance patrols with the necessary means every month and almost across the entire park.*

- *And finally, the integrity and commitment of the staff in its conservation mission. It should be noted that the OIPR plays an important interface role between these organizations and the donors and institutions for their support.*

Figure 31. Participants of the knowledge exchange visit by senior Centre Forestière de N'Zerekore staff and Fauna & Flora International Guinea personnel to Taï National Park, Côte d'Ivoire

(photo courtesy of T. Koighae)

Namibia

A high-level study tour to Namibia was arranged for FDA senior management under TGKS at the end of September 2019. Due to the costs of the CFZ trip to Côte d'Ivoire being significantly less than Rwanda, the ZWW team funded four government representatives to join, including FDA PA manager Evangeline Swope, representative of Electoral District 4 (Lofa County) Hon. Mariamu Fofana, Lofa County superintendent Hon. William Tamba Kamba and Liberia Land Authority chairman Atty. Adams Manobah, plus ZWW project manager Wing Crawley. The visit focused on transboundary conservation, ecotourism and community-based natural resource management, which has been highly successful in Namibia. Other members of the 17-person delegation were Lee Nagbe Chea (county superintendent, Sinoe), Philip Nyenuh (county superintendent, Grand Gedeh), Blamah Goll (conservation technical manager, FDA), Joseph Tally (deputy managing director of operations, FDA), C. Mike Doryen (managing director, FDA), Hon. Vincent Willie (chairman, House Committee on Mines, Energy, Environment and Natural Resources), Hon. Matthew ZarZar (representative of Electoral District 3, Sinoe County), Kai Farley (county superintendent, Grand Gedeh), Urias Goll (facilitator) and Shadrach Kerwillain (project manager, TGKS). The WA BiCC national coordinator Assaf Kumeh was also part of the delegation.

The group was hosted by NACSO and met with representatives from the Ministry of Environment and Tourism, parliamentarians and several working groups (e.g., the Natural Resource Working Group and Business Enterprise and Livelihood Working Group). Presentations at the ministry included but were not limited to conservation and sustainable management policy in Namibia, an overview of the Kavango-Zambezi Transfrontier Conservation Area, community conservation, landscape conservation areas in Namibia and the self-insurance scheme (set up for compensation of HWC). The team then embarked on a field trip to the Zambezi region (which is the heart of the Kavango-Zambezi Transfrontier Conservation Area) where they were formally welcomed by regional government and met with the Kayramacan Association, who manage Bwabata National Park, and members of the Mashi, Lubuta and Lachona Conservancies. The team also experienced a magnificent game drive in Bwabata National Park. The experience really left an impression on the

team and helped them to understand the potential of Liberia with regard to ecotourism. Hon. Fofana declared herself a conservationist at the wrap-up meeting and is very keen to be involved in project activities going forward, as are the other delegates. A WhatsApp group has been created for everyone to stay in contact, and there is strong support for the gazettement of Wonegizi. A field trip to Wonegizi is planned in November for county superintendent Hon. Fofana and the FDA to check on FFI's progress with the gazettement and assist with some remaining demarcation challenges.

Full details of the study tour can be found in the report. The following is an excerpt from the report regarding lessons learned and recommendations.

Overall, the study tour achieved its overarching objectives of exposing delegates to a well-designed and effective practice of CBNRM as a tool for conservation. It also demonstrated the value and advantages associated with the implementation of transboundary conservation initiatives, as reflected in the participants' observations and recommendations (see below). Importantly, in addition to the strength and opportunities associated with these models, they were also able to explore the challenges and constraints associated with the implementation of these concepts.

The following are some key observations from the study tour:

1. *The CBNRM model in Namibia, particularly conservancies and community associations, are adaptable to Liberia with the possibility of adjusting the model to fit the particularly unique circumstances on the ground.*
2. *Community involvement and ownership of certain resources will increase protection, management and conservation efforts.*
3. *When well-managed, income from wildlife through tourism can have an overall positive impact on communities, delivering both social and ecological benefits.*
4. *Setting up a conservancy requires a bundle of different elements to succeed. These include partnership (between the government, community and private sector), systems (institutional and legal) and relevant policies. It isn't very easy to succeed if one of these is not functioning correctly.*
5. *To be effective and prevent abuse, CBNRM efforts must be based on a national policy in which the roles and responsibilities of each party are clearly defined. However, such a policy must be flexible and originate at the local level so that the policy is a reflection of the reality on the ground.*
6. *Enforcement of key provisions in the law, especially as it relates to wildlife crime and violation of protected areas regulations, is fundamental in ensuring compliance by various stakeholders, leading to protection of wildlife.*
7. *The quota system for hunting licenses in Namibia mirrors that of the system adopted for logging in Liberia. Hence, if Liberia wants to engage in trophy hunting, there needs to be an assessment of targeted species to determine the sustainable extraction rate. In the absence of such a process, trophy hunting has the propensity to decimate Liberia's wildlife. In this regard, ecotourism represents Liberia's most viable opportunity to earning revenue from conservation activities. It should be also noted that although fees from trophy hunting are big in Namibia, employment is much higher in tourism.*
8. *The overall challenge of community forestry in Liberia is the lack of alternative options (apart from logging) for communities to generate revenue for CF operations and to benefit communities. Potential ecotourism models from Namibia which could be adopted in Liberia by Community Forest Management Bodies and partners include: private investor agreements with conservancies to rent land for ecotourism (e.g., Serendola Lodge) from which a percentage of the profit goes to the conservancy; or government, private and conservancy partnerships, whereby the government gives the right to conservancies to build a lodge in a protected area and all receive a percentage of the profits.*
9. *Considering the dearth of funding for environmental management (including biodiversity conservation) in Liberia, an environmental investment fund should be established. This could be managed jointly by the*

government and other partners to attract international investment for sustainable environmental management. The model of Namibia EIF is replicable to Liberia and the role of the Conservation Trust Fund, which has already been established by Conservation International, and partners in Liberia should also be explored.

10. *The government should develop a mechanism to address issues of human wildlife conflict and not expect it to go away quietly. An essential first step will be the assignment of dedicated staff to work on cases on HWC, documenting cases reported by communities to understand better the scale of the problem. Practical measures to reduce HWC which have been successful in other countries and can easily implemented by communities should be piloted in Liberia. Promptly reaching out to the victims will demonstrate that the government is interested in their welfare also and not only the wildlife.*
11. *Changed policies take time to implement, but those expected to implement the strategy must have the relevant knowledge and skills. Toward this end, it will be important to have training for relevant members of staff that will be expected to implement a policy prior to its launch and or roll-out.*
12. *FDA should utilize the authority of traditional leaders, making them champions for biodiversity conservation. An initial step could be engagement with the National Traditional Council of Liberia.*
13. *It will be essential to have a robust monitoring and evaluation system that feeds into adaptive management to ensure that policies to protect biodiversity are working.*
14. *For CBNRM and transboundary conservation to succeed in Liberia, intersectoral coordination is critical. This is especially relevant in the absence of a national land-use plan which would have to preclude competition from various government agencies to allocate for their use.*

Figure 32. Participants of the high-level study tour to Namibia

Capacity Building for Conservation, Global Conference

FFI facilitated the participation of Menladi Lormie (FDA biologist currently seconded to FFI) at the Capacity Building Conference for Conservation, Global Conference (CBCGC) at the Zoological Society of London. This is the fourth in a series of global meetings aimed at discussing and developing a variety of effective solutions to a range of capacity-building issues based on the premise that the sector needs to scale-up its capacity-building activities in order to address the growing and significant environmental challenges in the world today and in the future. The conference was attended by 165 persons from 90 countries and from 60 organizations across the world (CBCGC, 2019).

Lormie did a poster presentation (see Appendix B) at the event which focused on her story, the role of external partners in building her capacity and her role now in building other people's capacity. A

rather timely accolade occurred during the conference when Lormie was informed she was one of the winners of the 2019 African Ranger Award. Five core themes were covered at the conference, including:

1. Mapping capacity-building provisions and needs;
2. Regional perspectives;
3. Cross-cutting capacity visions for the future;
4. Funding capacity building—donor perspectives and interactions; and
5. Tools for conservation capacity—overviews, discussions and experiences.

The main output of the conference is a special edition of *Oryx* on developing capacity-building solutions (CBCGC, 2019).

Figure 33. Menladi Lormie with her African Ranger Award certificate

Below is an excerpt from Lormie's report.

Coming from a governmental institution, the process of selecting people you want to train is important. Sub-contracting consultancy firms that do not meet the set criteria for consultancy and how to monitor capacity that has been built needs attention for better results.

Capacity builders also need to think outside the box and should be flexible in their approach. They should encourage people, motivate and mobilize for diversity, support collaborative practices and promote curiosity, reflection and learning, as well as foster human wellbeing for sustainability.

Another lesson learnt was to always do an assessment of what capacity is needed and stick to methods that work well for a longer period for efficiency. Monitoring and evaluation are thought to be key to capacity, as many people seem not to focus on this during their capacity-building programs. Many learning programs focus on the English language (international English test), which might be a barrier to information sharing and capacity building that may cause important data to stay underground.

The side event on wildlife health was key too, as the presenter elaborated on collaborating with universities in African countries like Kenya and two other countries to train people in wildlife health and veterinary skills.

At the working group discussion, I learned about "soft skills" and the idea of partnership with organizations to avoid duplication of activities in the same landscape, as well as working with donors and communities to achieve results.

3.2 OBJECTIVE 2: SUPPORT CREATION OF AN ENABLING ENVIRONMENT THAT FACILITATES FOREST GOVERNANCE AND LAW ENFORCEMENT WITHIN ZWW LANDSCAPE COMPLEX

Context

Guinea's PAs benefit from a stronger structure and more on-the-ground ranger capacity than Liberia, but forthcoming changes to its conservation and management systems at the national level may cause resources to be appropriated away from park and conservation management. Liberia benefits from comparatively stronger institutional capacity at the national level, but its PAs are mostly proposed and regularly experience insufficient ranger capacity, infrastructure gaps and an inability to cover operational costs. Due to the FFI projects that have been in existence for several years, PA staff and local communities in both countries have some knowledge of key PA management and land use planning concepts, such as core conservation areas, community use zones, and transitional and buffer zones, but ongoing support is needed to implement, enforce and sustain these concepts for the benefit of biodiversity and local people.

3.2.1 ACTIVITY 2.1: BUILD STRONG COLLABORATION AMONG KEY ZWW STAKEHOLDERS

2.1.1: Develop and validate a FDA-CFZ memorandum of understanding on transboundary management of the ZWWF landscape

Following the official launch of the program in N'Zerekore, Guinea on October 19, 2018, at which both countries welcomed the opportunity to work together in the ZWW landscape, stakeholders met to develop a roadmap to guide the process. As a result of that meeting, the government of the Republic of Guinea (represented by the Ministère de l'Environnement, des Eaux et des Forêts [MEEF]), through the CFZ and the government of the Republic of Liberia (represented by the FDA) have worked together to develop three draft documents listed below:

1. **Bilateral Framework Agreement.** This is an overall agreement between the two countries to formalize their commitment to work together for effective conservation and sustainable management of the ZWW landscape and its natural resources.

2. **Operational Memorandum of Understanding.** This agreement details how the FDA and CFZ will work together on the ground to implement transboundary management activities (e.g., joint patrols, information sharing, awareness and other operational arrangements).
3. **Terms of Reference for the ZWW Transboundary Steering Committee.** This document defines the purpose, structure, roles and responsibilities of the steering committee in guiding and monitoring transboundary management of the ZWW landscape.

A validation meeting was held in Voinjama February 5–6, 2019 to review the documents, solicit input and gain consensus on the final drafts. The meeting provided an opportunity for stakeholders to reflect on the work to date regarding the conservation and sustainable management of the ZWW landscape. Participants took part in multi-stakeholder work sessions in order to review the documents, reach consensus, then finalize and validate the documents.

The event was attended by 57 participants, including representatives from MEEF, Ministry of Foreign Affairs, Ministry of Internal Affairs, Ministry of Gender, Wonegizi communities, Ziama communities, CFZ, FDA, county-level representatives (county superintendent, joint security services and district commissioners), EPA (Liberia), United States Agency for International Development (USAID), WA BiCC, FFI, IUCN, UNOPS and civil society.

The meeting began with two key presentations. The first presentation (by the FDA and FFI) introduced two projects being implemented by FFI—the "Conserving and Connecting the Ziama-Wonegizi-Wologizi Transboundary Forest Landscape between Guinea and Liberia" project, funded by USAID/WA BiCC, and the REDD+ project in Wonegizi, which is funded by NORAD.

Following the presentations, participants were then split into groups, and each group was tasked with reviewing one of the three draft documents. Groups presented their input and comments in plenary.

The second day began with a final review of the documents, again in plenary, in order to address any remaining comments or concerns and gain consensus on the final drafts.

The final exercise of the meeting was to list next steps to ensure the signing of the documents as follows:

- Comments and inputs to be incorporated into the documents in English and French;
- Documents to be submitted to the CFZ and FDA;
- The CFZ and FDA to submit documents to their respective ministries for review and approval;
- The CFZ and FDA to meet and discuss any changes made by the ministries and agree on final versions;
- The CFZ and FDA to submit the final document to their respective ministries for signing; and
- Hard copies of the documents to be exchanged for signing.

The validated documents were sent to the CFZ and FDA for onward submission to the relevant ministries in each country. Further details about the validation meeting can be found in the full workshop report.

Following the validation workshop, the CFZ organized a meeting with Guinea ministers in April 2019 to present and review the documents. The documents were also submitted to the Ministry of Foreign Affairs in Liberia. The Ministry of Foreign Affairs completed its review of the documents in July and approved the FDA to move forward with signing. Madam Watta (directrice, CFZ) advised that the minister would only sign the documents in the presence of his Liberian counterpart; therefore, a signing ceremony was organized in Conakry following a meeting to validate the Ziama management plan. The ZWW project manager met with the FDA Conservation Department in July

to go through the comments from the Guinea government, and final edits were made to the documents following last minute comments from the two countries. The documents were then harmonized in English and French.

The ZWW transboundary documents were officially signed at a ceremony in Conakry on October 24, 2019. Liberian delegates included: Hon. M. FoFana (District 4 representative), Hon. W. Tamba Kamba (Lofa County superintendent), Hon. C. Mike Doryen (managing director, FDA), Joseph Tally (deputy managing director of operations, FDA), Blamah Goll (technical manager of conservation, FDA), Evangeline Swope (PA manager, FDA), Christiana Wahblo (desk officer, international cooperation and economic affairs, Ministry of Foreign Affairs), Abraham Korvah (deputy minister of foreign affairs), Tarnue Mulbah (chairman, Wonegizi Community FMC), James Tarnue (Clan chief), Pastor James Korboi (Wologizi community representative) and the ZWW project manager. The Guinea delegation included representatives from the respective ministries, Mme. Camara Watta (directrice, CFZ), CFZ staff, UNOPS, Ziama communities and FFI Guinea staff. Both the Guinea and Liberia representatives stressed the need for resources so that transboundary activities can start as soon as possible.

Figure 34. Signing of the Ziama-Wonegizi-Wologizi bilateral framework agreement in Conakry

2.1.2: Establish a ZWWF steering committee

At the October 2018 launch, the CFZ presented on their work in Ziama, and FFI gave a presentation about its work in Guinea, including the deliverables under WA BiCC. During the meeting, there were concerns raised about the suspected reduction in elephant numbers in the transboundary area. However, there is a need for more surveys on the Liberia side.

After the launch, a bilateral meeting was held to establish the framework for dialogue and collaboration between Guinea and Liberia, and to set up a transboundary steering committee.

A planning and coordination meeting followed on the 20th, whereby the various partners working in the landscape identified areas of overlap and opportunities for synergy. Work plans were shared between partners and an integrated work plan put together for Ziama. A planning and coordination meeting was held in Monrovia on October 30th, attended by representatives from the FDA's REDD+ Implementation Unit (RIU), IUCN-Global Environment Facility-MRU coordination team and FFI,

where partners began the process of sharing work plans to improve coordination and complementarity.

As mentioned in Section 2.1.1, a ToR for the steering committee was validated in February 2019. The second steering committee meeting will be held in 2020 and funded by a different project.

3.2.2 ACTIVITY 2.2: STRENGTHEN FOREST GOVERNANCE WITHIN ZWWF

2.2.1: Conduct stakeholder needs assessment

Stakeholder needs assessments were designed with guidance from the FFI Capacity Buildng Team in Cambridge. Discussions between the Guinea and Liberia teams ensured consistency across the landscape and with TGKS. For ZWW, the questionnaire was administered to Ziama rangers and Wonegizi rangers in the form of a self-assessment. Following the success of the exchange visits to Taï National Park in Côte d'Ivoire and GRNP in Sierra Leone by Ziama and Wonegizi staff respectively, it is strongly recommended that these regional relationships continue to be strengthened with regular exchanges to build capacity, facilitate knowledge exchange and encourage collaboration, particularly with regard to combatting wildlife crime.

Ziama

Part of the remit of the consultant Alan Deverell was to put in place a capacity needs assessment for the Ziama ranger team. After consultation with CFZ senior staff, and with the assistance of the FFI Cambridge Capacity Team, a questionnaire was drawn up based on the IUCN Competencies for Protected Area Management. The questions were grouped around the following themes: anti-poaching and law enforcement, biomonitoring, participative management and the management of PAs.

The questionnaire was uploaded to the ODK server and installed on smartphones for the survey. On completion of the survey, all the data from the smartphones was uploaded remotely to the server and transformed into an Excel file for analysis. The survey took approximately 5 days, including the initial training. Fifty-seven of the rangers were interviewed out of a total of 70. The results have now been analysed, and the report by Alan Deverell with training recommendations is as follows:

After the initial capacity needs assessment carried out in February 2019, and the subsequent recommendations that were made regarding a program of training, the next step is to identify providers of that training and to draw up a schedule.

There are two main categories of training necessary; general basic skills training for the rangers and more specialized training for senior staff and selected rangers. However, for the more specialized trainings it is essential to first identify individuals who will be appointed to the various management positions. Currently there is no effective organogram in place for Ziama, and the management structure of the reserve is poorly structured and at best ad hoc. Although a restructuring of the management team is planned with the support of partners, there is no indication of when this might happen.

Given the technical expertise available within the FFI Guinea team, much of the training can be carried out in-house, as has been the case in the past. This can be supplemented with local and national expertise. One of the challenges is identifying trainers who are able to work in French. A possible solution to this is developing the relationship that has recently been established between CFZ and the Parc National de Taï in Côte d'Ivoire. During a recent visit, the possibility of sending rangers from Ziama to work alongside their colleagues in Taï for short periods was discussed. The director has also confirmed the availability of members of his senior staff to travel to Ziama to provide training for the rangers.

Table 9. Training plan for Ziama rangers

Module	Provider	Participants	Proposed Date
Rangers:			
Use of GPS/compass	Fauna & Flora International (FFI) team + Centre Forestière de N'Zerekore (CFZ) trainer	All rangers	Continuous
Data collecting methods (including spatial monitoring and reporting tool [SMART] and Cybertracker)	FFI team/Taï staff/United Nations Office for Project Services (UNOPS)	All rangers	Continuous
Advanced biomonitoring	Taï staff, Côte d'Ivoire	Bio team leaders	
ID of animal species	FFI team	Biomonitoring teams	
ID of plant species	Diabate Institue de Recherche Agronomique de Guinee (IRAG)	Biomonitoring teams	
Law enforcement	Taï staff, Côte d'Ivoire	LAB teams	
Forestry and wildlife laws	FFI team/judicial representative	All rangers	
Community engagement/Conflict management	Taï staff	Selected rangers	
Computing	Local expert	Patrol post heads	
English language	Local teacher	Guides/tourism team	
Tourism	Taï staff/UNOPS	Guides/tourism team	
Senior Staff:			
Finance and budgeting	FFI admin team	All senior staff	
Administrative procedures	FFI admin team	All senior staff	
Human resources	FFI admin team/other	Selected staff (TBD)	
Computer skills	Local expert	All senior staff	
Data management	Local expert	All senior staff	
SMART	Taï staff/UNOPS	Selected staff	
Report writing	FFI team	All senior staff	
Laws and judicial process	Local judiciary	All senior staff	
Community engagement	Taï visit	All senior staff	
Communications	Local expert/Taï staff	Selected staff	
Tourism and hospitality	Taï NP	Selected staff	

Wonegizi

For the WPPA, 12 FDA staff completed the questionnaire. Main findings from the assessment are included below:

- Only 29% of respondents felt they had the knowledge needed to do their job effectively.
- Eight out of 15 rangers (53%) felt they did not have the tools/equipment needed to do their jobs effectively, whilst the remaining respondents felt they had some of the tools/equipment required to do their jobs effectively.
- Sixty percent of respondents confirmed their job regularly involves the use of standard forms and recording systems and devices, whilst 40% said they use them occasionally. However, only four persons (27%) said they can use these tools well, seven (47%) indicated they can use them partially and three rangers (20%) said they struggle (one ranger did not answer). This suggests

the need for refresher courses regarding law enforcement and biomonitoring protocols and report forms, and any other duties requiring the use of these tools.

- Eleven (73%) said the job regularly involves recording and reporting of observations of wildlife, habitats and ecosystems, whilst the remaining respondents said their job occasionally involves this task. However, when asked how accurately they can do this task, only five rangers (33%) said they can do this accurately, five said partially and two said no (one respondent did not answer).
- Nine staff (60%) said their job regularly involves planning, leading and reporting on biodiversity research, survey and monitoring activities, and six respondents (40%) said occasionally. When asked if they could do this task accurately, five persons (33%) said yes, whilst seven (47%) said partially and three (20%) said no.
- Seven rangers (47%) said their job involves engaging with local communities on a regular basis, whilst eight rangers (53%) said occasionally. Over half, 53%, (eight persons) said they have strong knowledge and skills to do this effectively, 40% (six persons) said partially and one person did not answer.
- Forty-seven percent of respondents said they are able to enter data into a computer, 47% said no (one respondent did not answer).
- Training requirements suggested by respondents included computer, data processing, research and law enforcement.

The table below lists the training courses recommended for Wonegizi park staff.

Table 10. Recommended training for Wonegizi park staff

Module	Provider	Participants
Use of GPS/compass	Fauna & Flora International (FFI) team	All rangers
Data collecting methods (including spatial monitoring and reporting tool [SMART] and Cybertracker)	FFI team	All rangers
Patrol planning (using SMART)	FFI team	Zone wardens
Advanced biomonitoring	FFI team	Park biologist/bio team leaders
Biomonitoring	FFI team	All rangers
ID of animal species	FFI team	All rangers
ID of plant species	Forest Development Authority (FDA)	All rangers
Law enforcement—surveillance, due diligence, penal code, evidence collection etc.	FDA/ FFI team/ISAT	All rangers
Forestry and wildlife laws	FFI team/judicial representative	All rangers
Community engagement/Conflict management	FFI/FDA	All rangers
Computing	Local expert	All rangers
Report writing	FFI/FDA	All rangers
Data management	Local expert	Zone wardens, LE and Bio team leads
Climate change and REDD	FFI	All rangers
Human wildlife conflict mitigation	FFI/local expert (e.g., Elephant Research and Conservation [ELRECO])	All rangers

Module	Provider	Participants
Tourism	Gola Rainforest National Park (GRNP)	Zone wardens/selected staff

2.2.2: Review and develop a summary of local and regionally available training courses

A review and summary of training courses was conducted based on information collected from educational institutions in Liberia. Curriculum information from the UL, Cuttington University, Lofa County Community College (LCCC) and the Forestry Training Institute was received. Details of available courses can be found in the report. Recommendations from the review written by Menladi Lormie include the following:

- *Universities should separate the College of Agriculture from the School of Biological Science and not have the Biological Science Department in just the Science College focus on human biology and zoology only.*
- *Expand the School of Biological Science to offer biomedical and technology, applied ecology and conservation, veterinary medicine, botany, marine and fisheries and environmental science that will contribute to protecting biodiversity with a strong research activity to help students write theses and research papers.*
- *There should be an undergraduate degree offered in applied ecology and environmental science in universities.*
- *Aside from classroom teaching, lecturers could source excursions to feed into practical research and paper writing to prepare students with a wide range of ideas when furthering another highest academic sojourn. This is because research and thesis writing appear to be limited at the universities where students do group work instead of independent work.*
- *Universities and colleges should have laboratories and herbariums, as well as basic equipment to enable students and professors to advance in their scientific work. The universities and colleges should have a strong collaboration with conservation organizations and the forestry sectors to conduct practical research using stations in national parks and reserves.*
- *Strengthened collaborations with other African universities for student exchange programs to motivate students in their course work to have new experiences.*
- *Organize courses at FTI and universities to help conservation practitioners in ecotourism and hospitality, mentoring for the protection of thematic species, research methods and statistics etc.*

2.2.3: Support priority trainings and/or create best practices training courses as appropriate in line with training plan and ensure the participation Wologizi staff

A total of seventeen trainings were implemented during the course of this grant. Two trainings were jointly funded by NORAD and WA BiCC in 2019 (law enforcement and biomonitoring) and one (computer training for FDA Wonegizi staff) was solely funded by NORAD due to time limitations and Leahy vetting requirements. The IWT grant, funded by UKAid, supported SMART training for Wonegizi and Ziama rangers in February 2020. It should be noted that the Wologizi PPA does not have any law enforcement rangers posted around the PPA, although the regional forester and community forest rangers are based in Voinjama and reforestation staff are posted in Foya.

Figure 35. Bird ringing session during the ecological sampling techniques training at Konia, Liberia. Top left: setting the mist-net; top right: trapped adult male village weaver (Ploceus cucullatus); bottom left: properly identifying the species, age and sex of the trapped bird; bottom right: demonstrating how to ring the bird.

(Photos courtesy of J. Flomo, FFI)

Ecological sampling, July 2018

A self-assessment was conducted for FDA staff in biodiversity surveys. This was followed by a 5-day ecological sampling field course conducted by Dr. Yahkat Barshep (APLORI), and co-facilitated by Menladi Lormie (FDA seconded staff to the project) and Joseph Flomo (FFI). Twenty-two FDA (13 Wonegizi and 9 Foya) staff attended the training held July 19–24, 2018. The training served mainly as an introduction to ecological field sampling techniques for park staff whose job description and responsibilities include collection of biological and ecological field data. These trained FDA staff will participate in biomonitoring and rapid assessments to be conducted across the ZWW landscape.

The main objectives of the workshop were:

- Build capacity of FDA Wonegizi conservation officers, biomonitoring team leads and Foya FDA reforestation staff in ecological data collection techniques; and
- Facilitate a biostatistics course for FDA biodiversity officers and project interns to develop their skills in data management and analysis.

The training involved five field-based training sessions including:

1. Basic first aid, conducted by the Konia community clinic staff;
2. Equipment use/care/repair, conducted by Joseph Flomo (FFI);

3. Outdoor camping, conducted by Joseph Flomo (FFI);
4. Bird surveys and mist netting, conducted by Yahkat Barshep (APLORI); and
5. Vegetation sampling, conducted by Yahkat Barshep (APLORI).

A major challenge identified during the training was the lack of computer skills. As a result, the data management and analysis part of the course was postponed. In 2019, reputable IT institution BlueCrest University (NIIT) was engaged to provide the training in computer skills for the Wonegizi park staff, which was funded under another grant. The training in statistical analysis was also held later in 2019 and is reported below.

Law enforcement training, Wonegizi, October 2018

The law enforcement training for community eco guards occurred for 7 days on October 7–13, 2018 (this included travel days). There were 37 participants, including 13 FDA rangers from the WPPA and 24 recruited community eco guards from the 13 communities around and within the WPPA.

The below section is an excerpt taken from the law enforcement training report by Jallah Johnson, (deputy PA manager, FDA).

The overall objective of this training was to contribute to the conservation of Liberia's significant biodiversity by building basic skills in law enforcement and institutional collaboration for FDA rangers and community eco guards. The training output included but was not limited to improved capacity of forest rangers and community eco guards for collaborative park management, allowing them to understand the importance of the forest estate of Liberia. The training was funded by the West Africa Biodiversity and Climate Change (WA BiCC) program "Conserving and connecting the Ziama-Wonegizi-Wologizi Transboundary Forest Landscape between Guinea and Liberia," implemented by Fauna and Flora International (FFI) in collaboration with the FDA.

The training was intended to address the below specific objectives:

- *Enhance the knowledge and skills of forest rangers and community eco guards in data collection that will inform the FDA management/government on the progress and safety of the park;*
- *Train rangers and community eco guards to organize and implement successful law enforcement patrols; and*
- *Train rangers and community eco guards on the use of GPS and its application as well as their roles and responsibilities in protecting the Wonegizi PPA.*

As a means of capacity and skill strengthening of the Wonegizi PPA, focus was placed on three main components:

- *Law Enforcement;*
- *Institutional collaboration and history and importance of forest conservation in Liberia; and*
- *Monitoring.*

The first three days targeted patrol and law enforcement at the government (FDA) and community level, forest and its importance, first aid and application, as well as drill and ceremony. The fourth day focused on conflict resolution and conservation education to equip both the FDA and community eco guards with requisite conflict resolution techniques to address emerging issues as it relates to protected area management. The GPS training was aimed at acquainting rangers and community eco guards on its usage and taking coordinates of threats or other interesting observation as it relates to law enforcement and effective management of Wonegizi PPA. The GPS practical was also necessary as it helps in mapping locations of patrols and tracks for further investigation on activities.

Figure 36. Community auxiliaries at the law enforcement training in Konia

Pygmy hippopotamus survey training of trainers, Ziama, March 2019

FFI staff Philip Tem Dia (biodiversity technical specialist, ZWW) and Constant Ndjassi (technical specialist, PA management, Sapo) conducted a TOT workshop in Ziama for 11 people on the pygmy hippo survey methodology. Presentations on the first day included an overview of the pygmy hippo project under the CEPF, a general overview of pygmy hippo taxonomy, ecology, population dynamics, conservation status and threats and biomonitoring of pygmy hippos in Gola. Group work to review the community questionnaires was then conducted. Documentaries about pygmy hippos were also shown to participants. On the second day of training, participants learned about the pygmy hippo survey methodology and how to collect pygmy hippo dung. To make this more practical, participants were asked to fill in all pygmy hippo datasheets, conduct pygmy hippo surveys in the field, including both the plot and opportunitistic methods, and fill in the datasheet.

Biomonitoring training, Wonegizi, March 2019

A total of 32 (9 FDA, 8 students from LCCC and 15 community auxiliaries) were trained in general biomonitoring techniques in March. Philip Tem Dia (FFI biodiversity technical specialist for ZWW) led the training, assisted by John Flomo (chief park warden, Wonegizi), George N. Allison (FFI biodiversity officer) and Menladi Lormie (FDA seconded staff).

The below section is an excerpt taken from the general biomonitoring training report by Philip Tem Dia (FFI biodiversity technical specialist, ZWW).

In order to manage the different ecosystems in a protected area efficiently and securely, one needs to know and understand how they function and what impact humans may have upon them. The biomonitoring program in Wonegizi will help the management of the park (FDA), and national and international conservation organizations to evaluate and monitor animal populations and to assess the impact of humans on the ecosystem. Information on biological processes and human activities can be an extremely valuable tool for the management of the Wonegizi Proposed Protected Area (PPA). Up to date, rigorously obtained information will provide the FDA and national and international organizations a window into the reality of the forces at work within Wonegizi. Not only will the data help management to determine appropriate plans of action for managing the resources within Wonegizi, but when used effectively, the information can bring more support to the park in the form of increased tourism, scientific research, staffing and funding.

To monitor the success of conservation efforts in Wonegizi, there is the need to know animal densities and the extent of human encroachment before those efforts begin and to then monitor any changes (hopefully increases in animal densities and decreases in human encroachment). In addition, there is not enough trained personnel to conduct biomonitoring in the Wonegizi PPA. The biomonitoring program in Wonegizi will be the first in the area. It is based on this that the training was organized.

The following were the objectives of the training:

a) Train the community biomonitoring auxiliaries, FDA rangers and park biologist on the biomonitoring methodology;

b) Implement a biomonitoring program in the Wonegizi PPA; and

c) Engage students in ZWW project activities to increase knowledge and interest in conservation.

This was a 5-day training course. The first day of the training involved various presentations including a brief overview of the Wonegizi PPA, objectives of the training and general ethical field considerations and behavior. The final presentation of the day covered the general biomonitoring methodology.

On the second day, training was provided on the following topics: first aid, field equipment care and maintenance, protected species and the wildlife law of Liberia and the basic use of GPS and compass. The GPS training was immediately followed by practical session to close the day.

The second part of the first aid training kicked off the third day, followed by biomonitoring data collection including how to fill in the datasheets.

The fourth day focused on the National Pygmy Hippo Survey and topics covered: general information about the pygmy hippo, evaluation of the questionnaire (to tailor it to Wonegizi and ensure the language was appropriate), survey methodology including how to fill in the data collection sheet, dung collection protocol and how to fill in the dung collection datasheets. The day ended with a GPS refresher and practical session, followed by a quiz on all the topics the participants had been taught.

The fifth day involved a practical session in the forest. Participants went to the Wonegizi PPA where they practiced how to collect biomonitoring data by filling in the datasheet and organizing themselves. A certificate of participation was issued to all participants at the end of the training.

The biomonitoring survey commenced in June after finalization of the protocol (the training was highly interactive, and participants were encouraged to give their input on the methodology) and distribution of field equipment and materials.

Camera trap training, Wologizi, June 2019

A comprehensive camera trapping training was conducted in Voinjama June 25–29 by Philip Tem Dia (biodiversity technical specialist, ZWW) for a total of 29 persons (6 FDA, 14 community auxiliaries, 8 students from LCCC and 1 graduate from UL). Participants were required to do a mixture of theory and practical sessions. Topics covered during the training included:

- Camera trap survey activity plan;
- Camera set up;
- Battery preparation;
- Camera preparation;
- Field set up—spacing and placement;
- Damaged camera checklist;
- Data checklist;

- Roles and responsibilities of team members;
- General ethical field behavior;
- Health and safety;
- Practical use of GPS and refresher; and
- How to fill in the data collection sheet.

Figure 37. Philip Tem Dia conducting biomonitoring training in Konia

Statistical analysis training, Monrovia, August 2019

Dr. Yahkat Barshep (APLORI, Nigeria) conducted statistical analysis training in "R" and "Excel" for FFI interns, FFI staff (Liberia and Guinea) and the FDA park biologists from Wonegizi and Sapo. Nineteen persons attended the training. Below is a section from the training report by Dr. Barshep.

The course was aimed to equip participants with practical experience and skills in analyzing data, using some statistical techniques frequently used in the sciences. The skills include designing experiments, choosing appropriate statistical methods for visual display and statistical modelling of data, model checking, interpretation and reporting of statistical results, and understanding limitations of statistical methods and data. The statistical methods the participants were introduced to were:

1. *T-test;*
2. *Analysis of Variance and Analysis of Covariance;*
3. *Simple linear regression and multiple regression;*
4. *Polynomial regression (including the option for data transformation); and*

5. *Generalized linear regression (Poisson and logistic).*

Strong emphasis was placed on the practical application of the common statistical methods in ecological studies. Sample datasets were used for the practical sessions.

Figure 38. Participants during statistical analysis training

(Photo courtesy of Dr. Barshep)

Following the training, participants were able to:

- *Identify appropriate methods to summarize and present data;*
- *Identify appropriate statistical methods and models to analyze data with different error structure;*
- *Implement simple regression, multiple regression, analysis of variance, analysis of covariance, Kruskal–Wallis test, Wilcoxon signed-rank test, and generalized linear models using R software;*
- *Report results and draw conclusions from statistical output;*
- *Understand the limitations of particular statistical methods and a given dataset; and*
- *Compare different models using model selection criteria.*

The effectiveness of the statistical workshop depends on continual practice of the methods learned. Dr. Barshep suggests refresher courses could be organized periodically. Also, for the participants who are currently engaged in conservation projects/ecological surveys, they should be encouraged to use the skills learned during the training to analyze data collected during these surveys.

ArcGIS training, Monrovia, August 2019

Sam Gregory (FFI spatial analytics officer) conducted a 2-day training in basic ArcGIS skills for 14 persons, including two FDA park biologists, and FFI project and technical staff and interns.

Practical training was conducted in ArcGIS covering the following topics:

- Brief introduction/recap into ArcGIS;
- Creating, modifying and exporting useful layers—half a day learning how to make shapefiles, using different queries to select via location and attributes and exporting useful shapefiles and tables;
- Displaying data from the field—an opportunity for the team to produce some useful outputs from data collected by FFI over the years. This will go through preparing data for GIS, common issues when working with field data and displaying and analyzing the results;
- Useful links of online data, how to sign up, download and display data—examples being satellite images, elevation, GLAD alerts and biodiversity data;
- Exploring the FFI data collection and contributing to it; and
- Planning field visits and surveys using the skills learned.

Ground-truthing training, Zorzor, September 2019

A SOP for ground-truthing required to verify the land cover classification for the LLA was developed by Sam Gregory. The SOP was field tested in Wonegizi and finalized, ready for the 2-day training for the field team. A total of 16 persons were trained, including: four FDA rangers (two from Wonegizi and two from Wologizi-Voinjama), eight community auxiliaries (four from Wonegizi and four from Wologizi) and three team members from Guinea (one FFI Guinea staff and two CFZ rangers) were trained in ground-truthing data collection and the LLA. The training comprised both classroom and practical sessions to ensure team members were confident in using the densitometer, compass and GPS. During the field work, participants practiced locating sample points and data collection. Presentations on general ethical behavior and health and safety in the field were also given. During the training, trainees were grouped into two sub-teams per landscape, consisting of three persons per sub-team. Each sub-team was headed by an FDA ranger. All equipment needed for the data collection was provided.

Health and safety training (various dates in 2019)

A health and safety training presentation has been developed for field survey teams to ensure work is conducted as safely as possible. Topics covered in the presentation include:

- Pre-field work preparation;
- Satellite phone checking and operation;
- Common injuries and ailments;
- Personal medical kit;
- Camp safety and hygiene;
- Water management;
- Moving in the forest and what to do if you get lost;
- Avoiding snake bites and treating snake bites; and
- Evacuation procedure.

Since its finalization in March 2019, the health and safety training has been implemented with the remaining rapid biological assessment teams (plants, herptiles and small mammals) and the ground-truthing and camera trap teams, totaling 62 persons.

Camera trap and environmental DNA training, Ziama, February 2020

This training was conducted by Philip Tem Dia (biodiversity technical specialist, ZWW) based on the camera trap protocol developed for the ZWW and Sapo landscapes. The training involved presentations on the various topics as outlined in the protocol, such as camera set up, battery preparation, camera preparation, field set up etc. The participants also completed a 1-day field session to practice how to use the camera trap, GPS and also learn how to fill in the camera trap datasheets. Training videos on camera trapping were projected to give a better understanding to the participants. The group also learned about the general ethical field considerations, and the training ended with a quiz.

In addition, training on eDNA data collection techniques was provided. Environmental DNA is a method by which species can be detected in an area by screening water for DNA. This is because as animals move through water, they shed cells that contain DNA. The water contains genetic material from wildlife and can be filtered to capture the DNA. This method will be used to confirm the presence of pangolin species in the landscape.

A total of 10 persons completed the training.

SMART training (funded by UKAid), February 2020

From February 23 to March 6, 2020, FFI conducted a mission to Zorzor and Sérédou for the SMART and Cybertracker training of the Wonegizi and Ziama rangers. This mission took place in two phases.

Phase 1 (February 25–28): Training of Konia-Wonegizi staff

Training on the basic concepts of the SMART tool was given to the staff in service at the WPPA. A total of 15 people took part in the training: nine FDA staff, two FFI staff, three biomonitoring auxiliary and one FDA community volunteer. The following aspects were addressed during the training:

- A general overview was made on the concept of adaptive management and the SMART approach and its different functionalities.
- SMART and Cybertracker applications were installed on participants' computers.
- A session on data collection methods and the importance of data collection during patrols was organized.
- Practical data collection exercises using the datasheets were organized. These exercises made it possible to assess the level of the rangers' ability to collect data reliably in the field.
- The participants were taught how to create a conservation area on SMART, and in a participatory way, the Wonegizi Conservation Area was created.
- Learners were taught how to navigate on the base map and basic concepts in GIS were also given.
- Following the practical exercises, participants were trained on how to enter the data collected in SMART.
- The training continued with a presentation of the Cybertracker application and the installation in the computers of the different participants.

- We then continued with demonstration sessions of the use of the Cybertracker application, explaining the different categories and attributes and then with practical exercises.
- A data model adapted to the realities encountered in the field has been developed in a participatory manner with rangers.
- Afterwards, the configurable data model to be used in the devices was elaborated, following the remarks made by the rangers after the practical exercises made for data collection with the devices.
- The participants were also taught how to import data from the device to SMART.

Phase 2 (March 2-5): Trip to Sérédou, Guinea

The training focused on the use of the Cybertracker application for data collection during patrols. A total of 15 people took part in the training, including 13 rangers and 2 FFI staff. The following aspects were addressed during the training:

- A general overview was made on the concept of adaptive management and the SMART approach and its different functionalities.
- SMART and Cybertracker applications were installed on participants' computers.
- A session on data collection methods and the importance of data collection during patrols was organized.
- Practical data collection exercises using the datasheets were organized. These exercises made it possible to assess the level of the rangers' ability to collect data reliably in the field.
- An existant data model has been reviewed based on the observation made by rangers.
- We then continued with demonstration sessions of the use of the Cybertracker application, explaining the different categories and attributes and then with practical exercises.
- A practical exercise was carried out in the Ziama reserve to evaluate the rangers' ability to use the device in the forest, but also to test the acquisition of GPS by the devices and the quality of tracking.

Figure 39. Constant Ndjassi (Fauna & Flora International technical specialist, protected area management, Sapo landscape) conducting spatial monitoring and reporting tool trainnig for Centre Forestière de N'Zerekore rangers in Ziama

Recommendations:

1. Provide CP3 device for SMART implementation on both sides. They have very good tracking, can get satellite very quick and are very robust;
2. Additionnal computer training to rangers in Wonegizi;
3. Identify a ranger who will manage the database in Wonegizi and work closely with him;
4. Develop a separate data model for the biomonitoring team who will be collecting more data on wildlife;
5. Provide at least one device to each biomonitoring and patrol team; and
6. Continous follow-up training to ensure a good acquisition of the use of Cybertracker.

Wildlife law training, March 2020

Training on the 2016 National Wildlife Conservation and Protected Area Management Law was conducted in March 2020. A joint team headed by the FDA and comprising representatives from the Transnational Crimes Unit, MOJ, LCRP and FFI delivered the training. A draft agenda was shared with the LESC for comment, as the training will be conducted by the different partners in their respective landscapes. The 1-day training was implemented in Voinjama on March 5th and Zorzor on March 7th. A total of 64 persons (33 in Voinjama and 31 in Zorzor) attended the training.

A series of presentations were given, including:

- Overview of global wildlife crime;
- Introduction to the 2016 National Wildlife Conservation and Protected Area Management Law;
- Protected Species of Liberia/IUCN Red List and CITES;
- Chapter 8: Trade in Wild Animals, Protected Animals and Wildlife Products;
- Chapter 11: Offenses and Penalties;
- Introduction to the LESC, Wildlife Crime Task Force and Confiscation Unit;
- Procedure for arrests;
- Evidence collection and asset seizure; and
- Emergency animal care.

At the end of the day, participants were split into mixed groups and asked to list the challenges with regard to arrests and prosecutions for wildlife crime. The groups then developed recommendations to address those challenges and presented their work in plenary.

Challenges highlighted at the training include:

- Limited manpower in all agencies (e.g., FDA, LNP etc.);
- Budgetary constraints—the government does not have money to sponsor enforcement agencies to do their work in the areas where the crimes happen;
- Interference by senior government officials and "higher-ups"—this is a constraint on the work of the security personnel, as their jobs are threatened if they refuse to drop an investigation/case;
- Limited education/awareness about protected species and the wildlife law;
- Lack of logistics to do their jobs;
- Limited cooperation from some community members and security actors (e.g., chiefs aiding and abetting cases). Town chiefs also give us a tough time, as they won't tell the truth as they feel they are related. Even amongst us security people. Claims and counter claims between security;
- Corruption;
- No storage for proper preservation of specimens;
- No coordination between enforcement agencies;
- Agencies unable to implement a robust response to the crime scene—many times security officers go to the crime scene, but are limited with regard to resources (e.g., no logistics and manpower is limited);
- Arrest made, but the perpetrator is not charged in court;
- Limited alternative livelihoods for communities; and
- Culture—Liberia's preference for bushmeat.

Interestingly, groups tended to identify the same challenges with arrests and prosecutions for wildlife crime. All teams at both trainings listed interference from senior government officials/persons, limited resources (manpower, logistics, equipment and budget) and limited awareness about the law as major challenges they face in implementing the law.

Recommendations for improving arrests and prosecutions include:

- Top government officials should stop interfering in cases sent to court. Engage this group to sensitize them about the law.
- People who are guilty in court should bear the full weight of the law without favor. At the prosecution level, the law should take its course. Ensure that magistrates are fully informed, and that the FDA and MOJ are monitoring and mentoring cases.
- All bail shall be effective by the law. If a person is released on bail and does not return, the individual that paid the bond should be arrested.
- Create awareness with all stakeholders, including paramount chiefs, town chiefs, elders, zoes (traditional doctors) and hunters, as communities need to be informed. Engage the traditional council at all levels.
- Information sharing—create a communication network for sharing information. All magistrates, attorneys, police stations, check-points etc. should receive copies of the updated penal code and the wildlife law.
- Increase manpower, mobility and resources for all enforcement personnel.
- Violators should be taken to court for speedy trial through due process.
- Continue awareness and training for all enforcement agency staff and judiciary to increase understanding about the global impacts of wildlife crime and the threat it poses to national security so it is taken more seriously. Training should be provided to ensure due process is followed so cases are not dropped in court.

The training highlighted the need for clarity about where fines for wildlife crime should be paid, as there is confusion about whether the fines should be deposited into an FDA account or not. In addition, nearly all participants who attended the training did not have a copy of the 2016 wildlife law or the revised penal code.

Figure 40. Atty. Yanquoi Dolo (Forestry Development Authority lawyer) presenting an overview of the National Wildlife Conservation and Protected Area Management Law in Voinjama March 5, 2020

Figure 41. Group work at the wildlife law training in Zorzor March 7, 2020

Computer skills training, March 2020

In 2019, the majority of Wonegizi FDA rangers were trained in computer skills under the NORAD project. Jallah N'ganfuen and Andrew Buta were unable to attend the training as they were needed to maintain a presence in the park; therefore, it was arranged for them to attend a 4-day training course in Monrovia in March 2020. Due to COVID-19 restrictions, it was arranged for the training to be held at the FFI office. The training was conducted by a tutor from the International Institute of Computer Studies & Manpower Development and covered the following topics:

- Computer awareness;
- Windows 10;
- Microsoft Word;
- Microsoft Excel;
- Microsoft PPT; and
- Internet Explorer.

2.2.4: Support law enforcement through the provision of means of transport

The World Bank's Liberia Forest Sector Project (LFSP) has provided 12 motorbikes to FDA rangers in Wonegizi. Three motorbikes have been purchased to provide additional support for law enforcement, biomonitoring and the HWC response team with WA BiCC funds. FFI Liberia is providing fuel as and when required to assist with law enforcement patrols.

FFI Guinea is supporting CFZ patrols by providing fuel for any movement of patrols. UNOPS provided some motorbikes in the past, but most guards were using their old personal bikes. A total of 19 new motorbikes have been provided to the CFZ by FFI to facilitate park operations. The new vehicle purchased under this project also has enough space to transport the surveillance and arresting teams.

2.2.5: Law enforcement

Liberia

Monthly law enforcement patrols began in Wonegizi in December 2018. This is the first time there have been regular patrols at this site. Efforts to patrol were made previously by the FDA, but did not continue due to lack of resources. Law enforcement activities in the Wonegizi PPA are conducted by five teams comprising FDA rangers and community auxiliaries. The methodology is based on the patrol protocol developed by Tina Vogt (2016) and adapted to the Wonegizi site. All teams patrol for approximately 10 days each on a monthly basis across three administrative zones. Teams record direct and indirect observations of human activities, and sections within the park are categorized by area in the PPA: core conservation zone (CCZ), buffer zone, community land and other. Patrols also collect opportunistic data on the presence of chimpanzees, elephants and pygmy hippos. The teams have conducted a total of 464 patrol days for the period December 2018–February 2020, which gives a total survey effort of 2735 patrol man days (see Fig. 42 for monthly totals). Rangers covered a total distance of 3597.76 km. A total of 4542 gunshells, 490 traps/snares, 5 confiscated shotguns and 86 poaching camps were recorded over the project period. However, only one arrest was made.

Figure 42. Total number of patrol man days patrolled per month in the Wonegizi proposed protected area

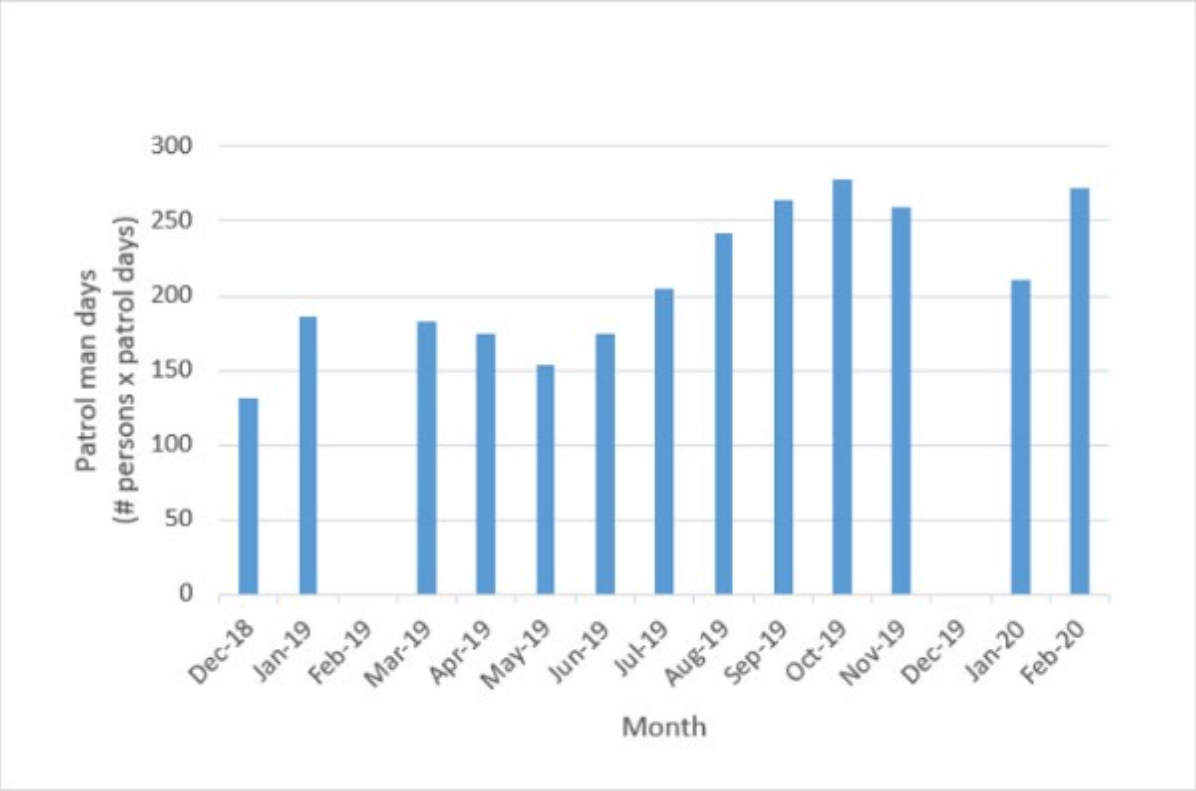


Figure 43. Poacher camps in the Wonegizi proposed protected area

The majority of human activities recorded are related to hunting, with most signs being recorded in the CCZ, followed by the buffer zone. This pattern continued from June to August 2019, with signs of hunting being the most prominent, followed by farming. In June, one hunter from Guinea who was carrying a single-barrel shotgun was arrested by the biomonitoring team in Wonegizi, close to the border. The FDA ranger interviewed the individual, took his photo and confiscated the gun. According to the ranger, the person said he needed to urinate. He was allowed to go, but then ran away. A report was made to the chief park warden and the FDA head office in Monrovia. Plans were made to pass the report and shotgun to the CFZ. In a separate incident, another man was arrested with a chainsaw in Wonegizi. The chainsaw was confiscated and the man was interviewed, but he was allowed to go. There is some trepidation about arresting people from Guinea for offences committed in Wonegizi. The transboundary operational MoU will assist in developing a protocol for such situations between the FDA and CFZ in the future.

From August 2019 onwards, there is a reduction in hunting activities in Wonegizi, as can be seen from the number of spent cartridges and traps recorded (see Fig 44). It will be interesting to see if this trend is continued throughout 2020 and beyond. At the time of writing, the FDA has advised that parks are operational, so patrols and biomonitoring are being conducted whilst following all precautions to prevent the spread of COVID-19.

Figure 44. Monthly records of spent cartridges (gunshells) and traps/snares recorded by law enforcement patrols in the Wonegizi proposed protected area (December 2018–February 2020; not corrected by effort)

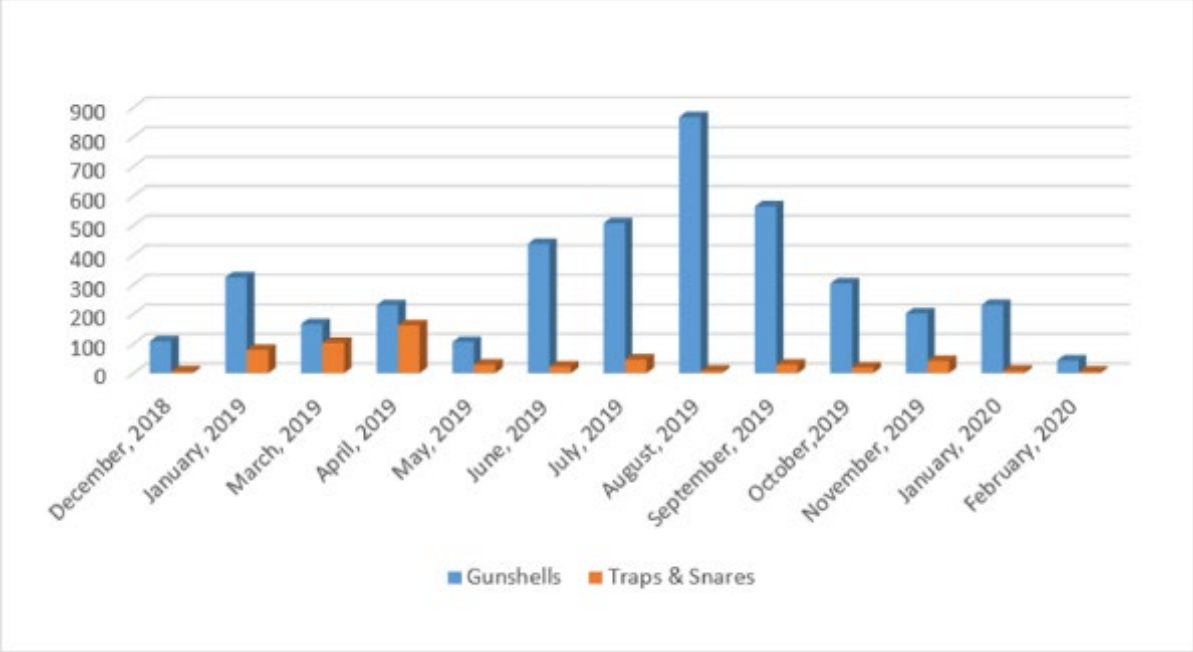
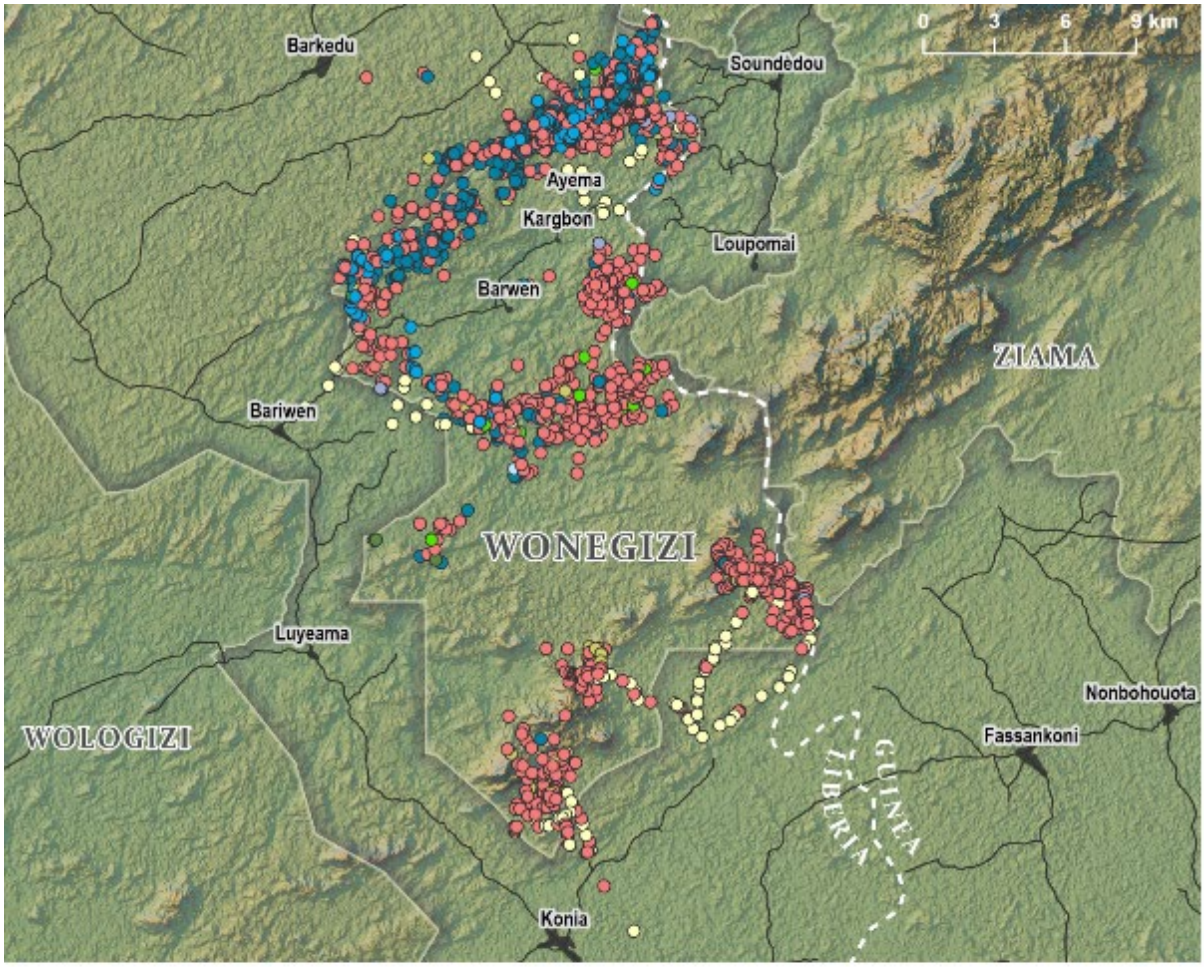


Figure 44 shows records of spent cartridges (gunshells) and traps/snares recorded from December 2018 to February 2020. The increase in the number of records from May to August 2019 should be interpreted with care, as it likely reflects the patrol days, which increased from May onwards. However, it seems the patrols are having an impact on reducing hunting in the park.

The distribution map (Fig. 45) indicates that human activities are currently taking place in all areas and zones of the park. This is down to the fact that the size of the park is relatively small (37,979 ha) and also surrounded by more than 13 communities that live very close to the park (three are located inside the park). The proximity of the park to human settlements accounts for the high human activities recorded in the CCZ. This reflects the fact that the main economic activities of the population surrounding the park are hunting and subsistence farming. Furthermore, the park is in the process of being formally gazetted as a multiple-use reserve, and as such the CCZ and buffer zone are not in full effect yet. There is also a possibility that the impending gazettement is causing communities to exploit more resources than usual before the park is gazetted and management implemented (e.g., the yellow traffic light effect). Hunting activities recorded in the WPPA were recorded in two main zones of the park—the CCZ (80%) and the buffer zone (20%).

Figure 45. Spatial distribution of human activity signs recorded by law enforcement patrols in the Wonegizi proposed protected area (January 2019–February 2020). Species records refer to direct/indirect signs recorded during patrols for the Western chimpanzee, forest elephant and pygmy hippopotamus



Guinea

Law enforcement patrols continued in Ziama with teams deployed on routine patrols on a monthly basis. The two law enforcement teams comprise six guards each and are usually deployed for 15–16 nights, whereas the two anti-poaching reconnaissance teams comprise four rangers and one local scout and patrol for 8-10 days.

A total of 220 missions for 1016 field days were carried out by the law enforcement and reconnaissance teams from April 2018 to March 2020, representing 5176 patrol man days (see Fig. 46). The results of these activities show a total of 6229 signs of poaching and land clearing, with 30 poachers arrested, 186 12-gauge rifles seized and 2803 snares and 2777 spent cartridges removed. Figure 47 depicts illegal activities per patrol effort per month showing seasonal tendencies in hunting pressure, with a peak in January, and then decreasing to a period of low poaching activity June–August/September, and increasing again from October. Signs of poaching (trapping and hunting with rifles), followed by illegal clearing represent the most significant threats in the reserve (see Fig. 51). Land clearing in the reserve, particularly in the core area, which is supposed to be untouched by illegal activities, continues despite several awareness-raising interventions on the site with the support of partners. This persistence of threats in the face of continued enforcement could be due to impunity because offenders are not punished to the extent of their offences. It is therefore urgent that appropriate measures be taken at site-level, and that CFZ management investigate the root causes of this progression of clearing in the reserve, especially in the core areas that are supposed to be intact.

Figure 46: Total number of patrol man days patrolled per month in the Ziama Man and Biosphere Reserve

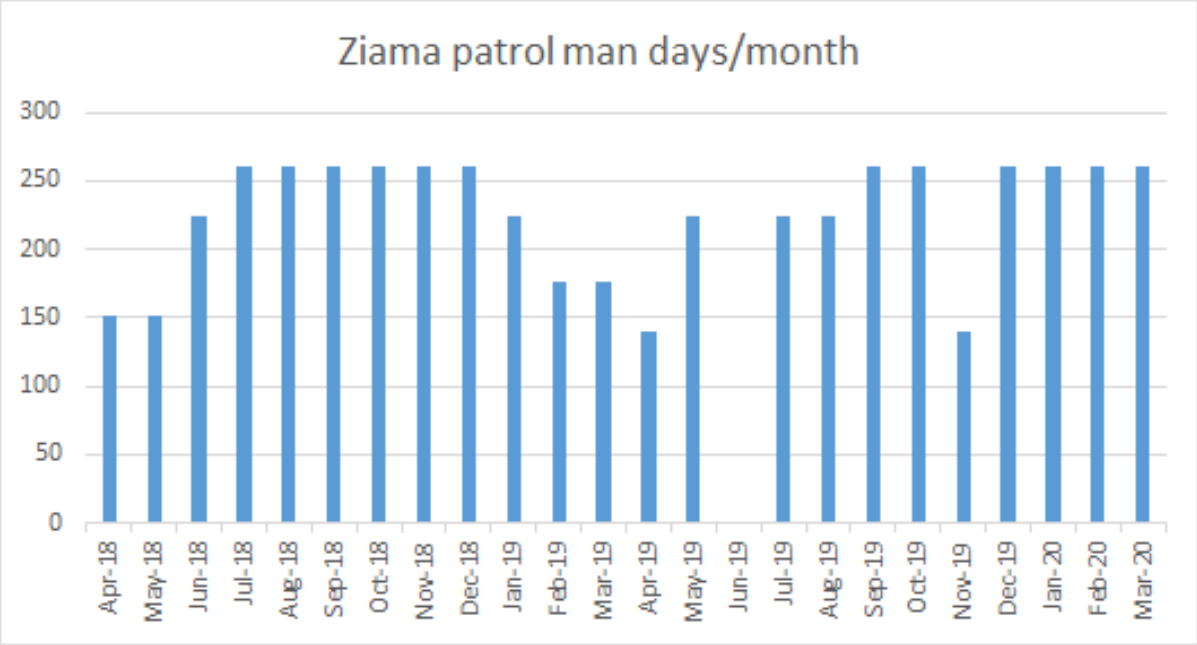


Figure 47. Monthly records of illegal activities recorded by law enforcement patrols in the Ziama Man and Biosphere Reserve (April 2018–March 2020; corrected by effort)

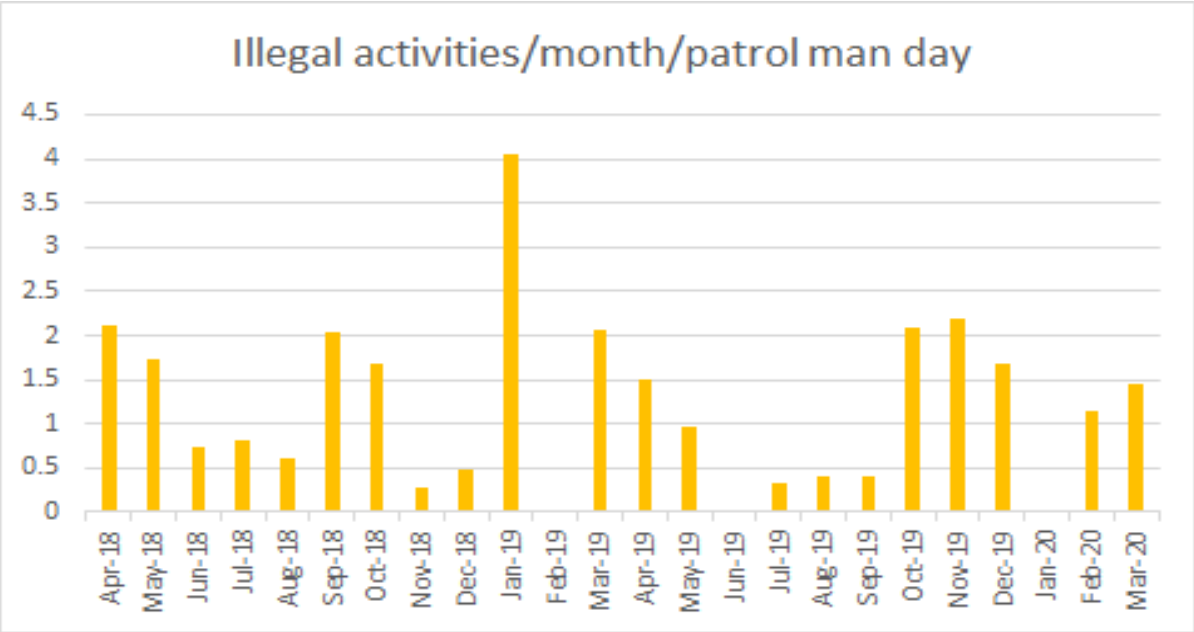


Figure 48. Perpetrators arrested by the anti-poaching reconnaissance team in the Ziama Man and Biosphere Reserve

Figure 49. Illegal clearing of high forest in Ziama discovered by Centre Forestière de N'Zerekore rangers in March 2019

(Photo courtesy of T. Koighae)

Figure 50. Spent cartridges (left); traps/snares collected by law enforcement rangers in the Ziama Man and Biosphere Reserve (right)

(Photos courtesy of T Koighae)

Figure 51. Illegal activities recorded in the Ziama Man and Biosphere Reserve

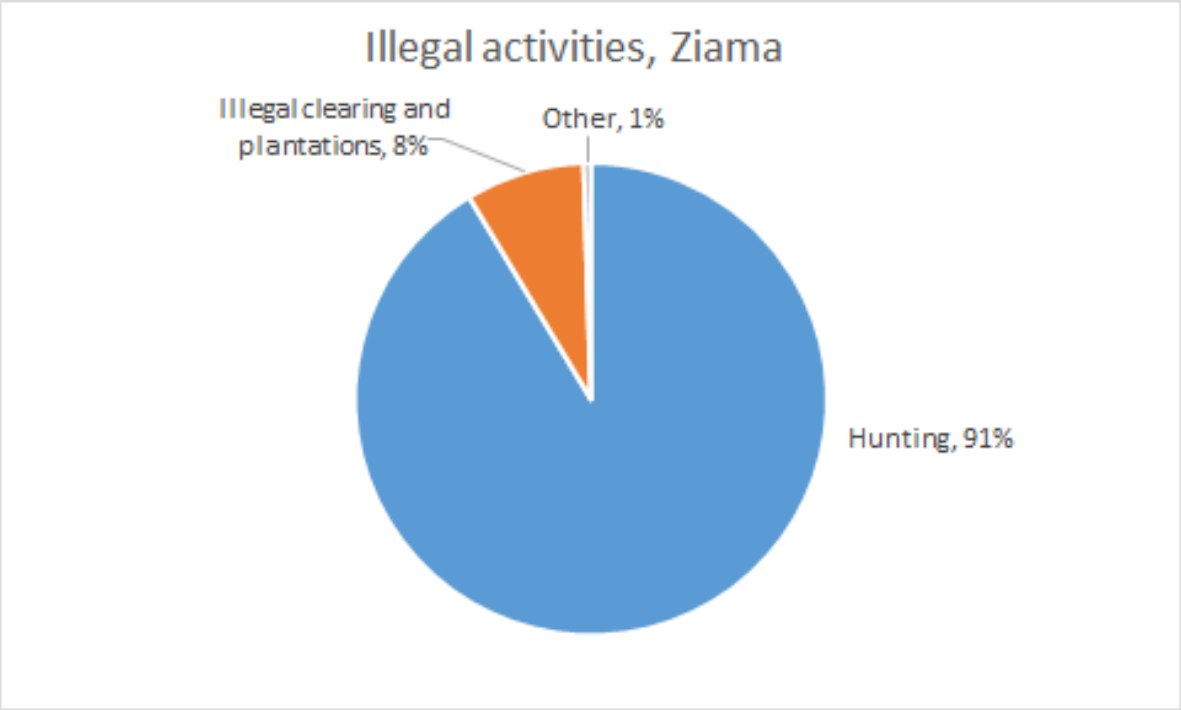
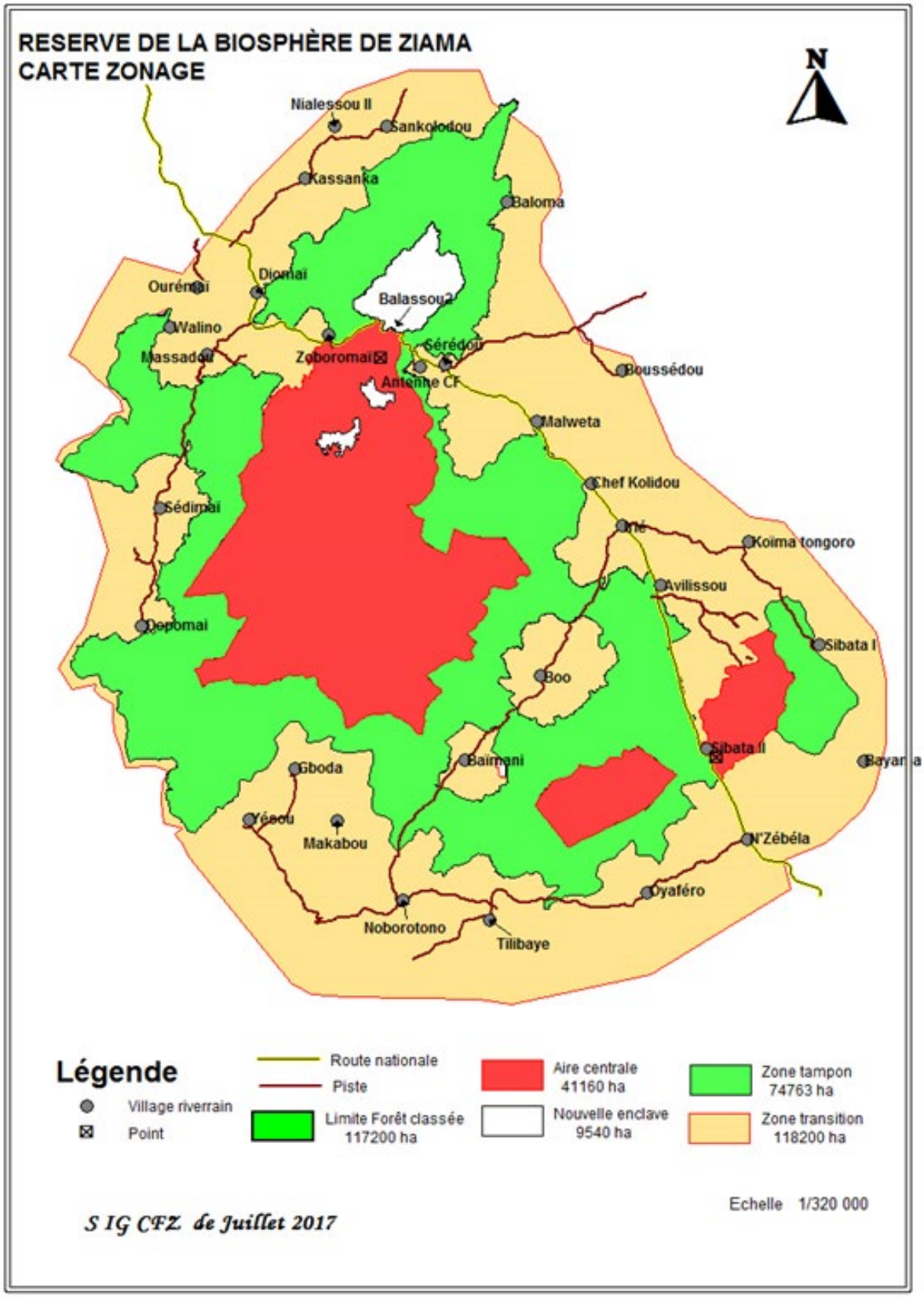


Figure 52. Map of the different zones in Ziama (red—conservation zone, green—buffer zone, beige—transition zone)



The Ziama MAB is divided into three zones: the transition zone, buffer zone and core area (Fig. 52). The spatial distribution of human activities recorded during patrols indicates that hunting with a

shotgun is prevalent around the communities, particularly in the areas of Kpoda, Dopamai, Sedemai, Massadou and Malweita. Use of traps and snares is more widespread and, again, corresponds with community areas. Poaching camps surround the park. The records of human activities also reflect that rangers find it difficult to access the center of the park because of the mountain and ravines. Also, patrol distance is limited due to the teams' need to return to post to sleep because of the unavailability of camping tents. Therefore, it is likely that human activities are occurring in the center of the park, but they are not being recorded because of the lack of patrol coverage. Hunting activities are occurring in the core area close to Kpoda and Malweita.

Landscape level results

Human activity data from law enforcement patrols and biomonitoring in Wonegizi and Ziama, and rapid biodiversity assessments in Wologizi were combined and used to generate maps to show the distribution and frequency of human activities across the landscape. Figure 53 shows the distribution of human activities recorded across the landscape during the different surveys. Figure 54 displays the frequency of human activities recorded during the various surveys. It should be noted that frequency of human activities will be less in Wologizi, as regular law enforcement and biomonitoring are conducted in Wonegizi and Ziama only.

Figure 53. Distribution of human activities in the Ziama-Wonegizi-Wologizi landscape

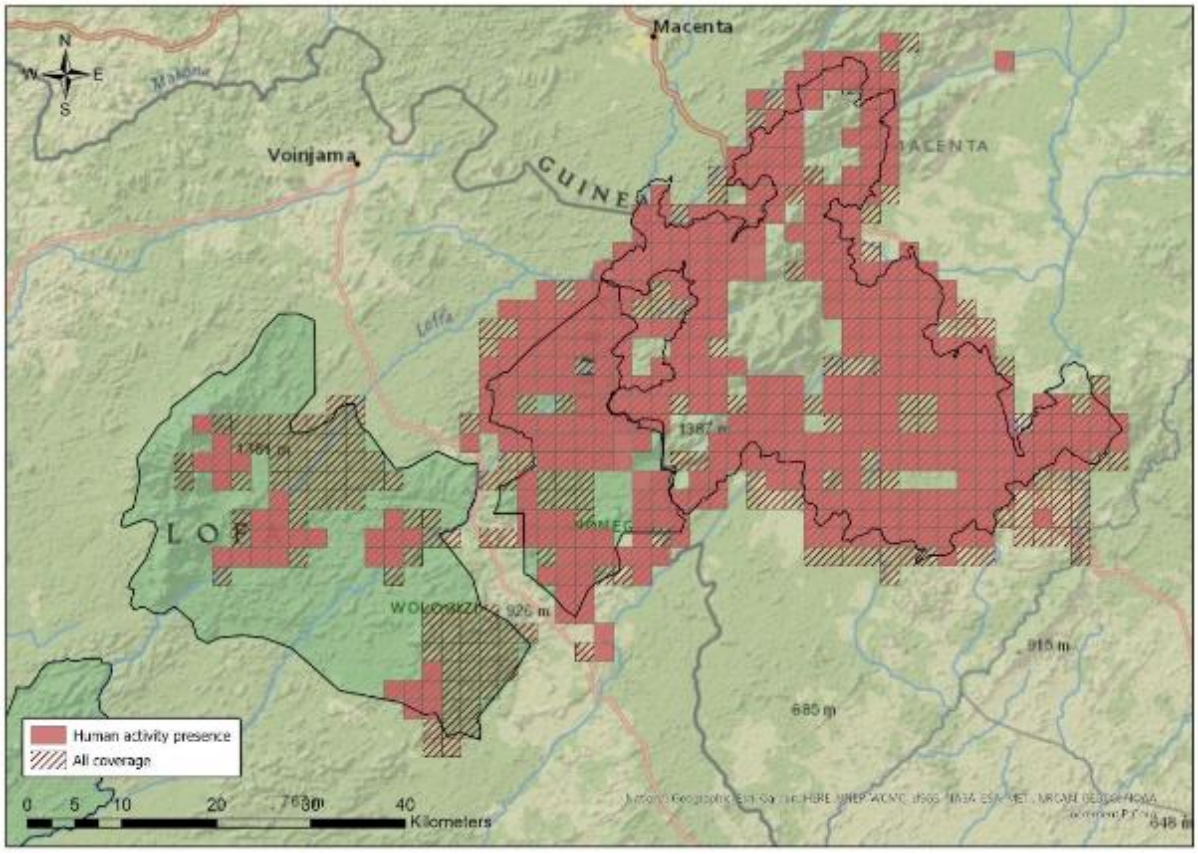
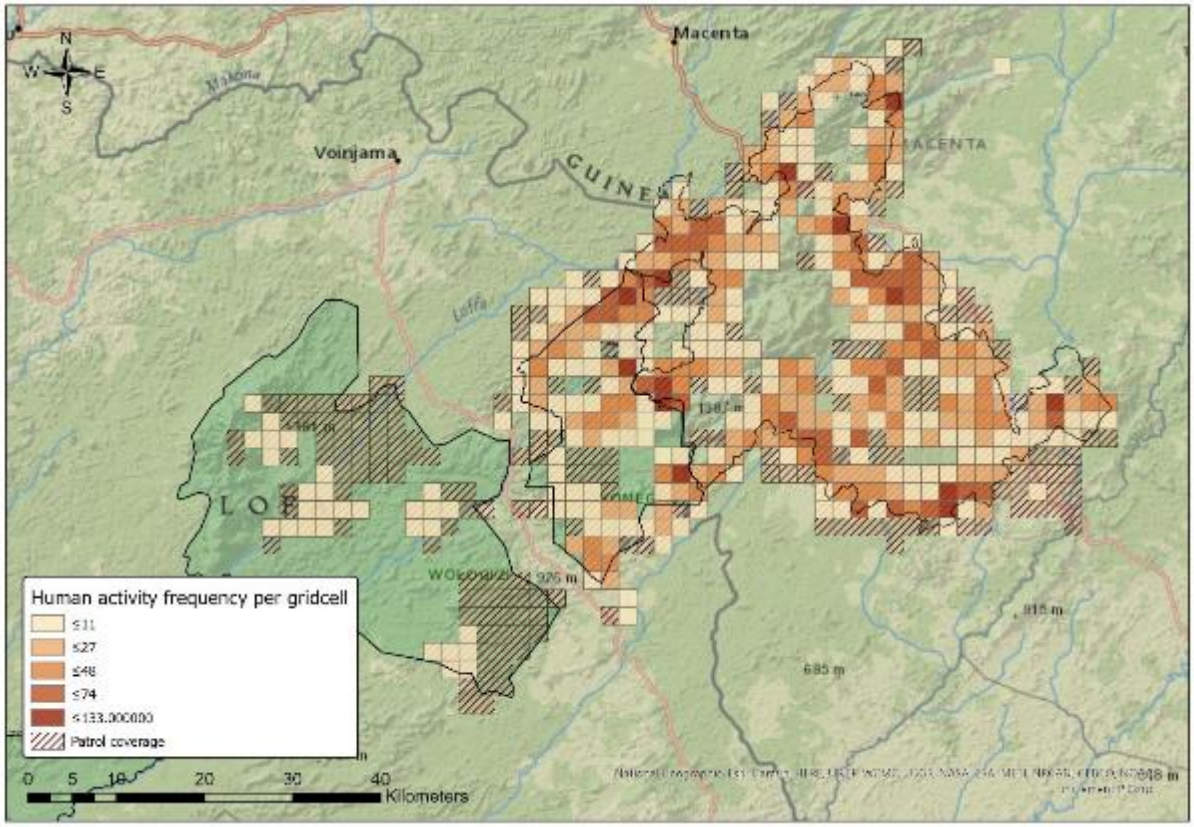


Figure 54. Frequency of human activities in the Ziama-Wonegizi-Wologizi landscape



Human activity frequency is high either side of the border in the north, middle and south edges of the border between Wonegizi and Ziama. The biomonitoring records show chimpanzee, pygmy hippopotamus and forest elephant distribution also correspond with these same areas. The cluster of human activities that intersect Wonegizi closer to the northern part of reserve reflects the three communities of Barwen, Kargbota and I-mah. The northern part of Wonegizi is under severe pressure and will likely become separated from the rest of the reserve unless strict measures are put into place urgently to manage human activities. Indeed, the large mammal survey team reported that the northern transboundary corridor is already under threat and surrounded by encroachment. Unfortunately, the limited width of the corridor will be further reduced by the new demarcation line (ELRECO, 2020).

Commercial hunting camps were also reported in Zone 1 of the PPA, highlighting the need for enforcement to be stepped up. The 2016 wildlife law applies whether Wonegizi is gazetted or not, and rangers need to be given the required support and encouragement to enforce the law.

3.3 OBJECTIVE 3: PROMOTE SUSTAINABLE LIVELIHOOD ACTIVITIES THAT CONTRIBUTE TO THE IMPROVED WELLBEING OF PEOPLE WITHIN THE ZWWF LANDSCAPE AND REDUCE UNSUSTAINABLE FOREST DEPENDENCY WHILE STRIVING TO IDENTIFY SUSTAINABLE FOREST MANAGEMENT APPROACHES.

Context

Park authorities and NGO conservation partners are currently navigating through different approaches to develop monetary and/or nonmonetary incentives to encourage local people to support conservation. Liberia has embraced REDD+, for example, while the authority in Guinea is currently trying to avoid creating reliance on financial incentives because of concerns over its long-term sustainability, especially in the face of population growth and in-migration. This creates a

delicate balancing act of trying to create incentives while not fuelling resentment as word of one incentive scheme reaches communities affected by a different scheme.

Main achievements

Overall, the main achievements of the livelihood activities in Ziama have been the introduction and adoption of improved farming techniques. For example, in Dopamai/Sedemai the farmers were very focused on integrated pest management (IPM), as that seemed to be what they found to be most interesting and successful. The biodiversity gain is clear there because the only easily accessible chemical pesticide in the area is Carbofuran (banned in the EU/most of the world). Farmers, we found to our surprise, were already quite concerned about using these chemicals, but saw no other alternatives. The response to the trainings on the biopesticides was extremely positive, and there is every hope that they will continue to employ these methods in the future.

In order to reduce threats to biodiversity and avoid the encroachment of PAs, carrying out support activities for local residents for only one agricultural campaign does not allow us to achieve the expected results. For example, the production of cash crops such as coffee takes at least 3 years before production. For the promotion of vegetable crops, the campaign enabled farmers to acquire good vegetable production techniques in order to increase their livelihoods and gradually integrate the process of reducing threats to biodiversity following carrying out agricultural activities in the region without harming the environment.

Following the LLA, it will be important to regularly monitor changes in land use going forward—over a minimum of a 5-year period—to assess if our interventions are stabilizing shifting agriculture, improving food security and reducing pressure on the reserve.

3.3.1 ACTIVITY 3.1: SUPPORTING ZWWF MICRO-ECONOMY

3.1.1: Develop farmer field schools in Ziama and Wonegizi

ToRs were drawn up for an agricultural study to be carried out in the villages of Sedemai, Dopamai and Kpoda with a view to setting up FFSs. These villages were chosen due to their strategic location along the Liberia/Guinea border, an important wildlife corridor. A questionnaire was developed and loaded onto smartphones using ODK software. The study was carried out in March 2019, with a total of 180 farmers being interviewed. The recently published report provides analyses on current agricultural activity and areas of support that farmers are seeking. This is part of setting up field schools and learning to improve agricultural practices and promote effective involvement of communities in the cross-border management of the landscape.

Currently there are 75 (47 males and 28 females) direct beneficiaries of the FFS: twenty-five members in Kpoda, Sedemai and Dopamai. Indirect beneficiaries total 800 persons (374 males and 426 females)—258 in Kpoda, 333 in Sedemai and 209 in Dopamai.

April 2019 saw FFS activities ramped up significantly, including:

- Sites for FFSs in Kpoda, Sedemai and Dopamai cleared, and installation of three market garden nurseries (chilli, landa and African aubergine);
- Three agro forestry nurseries for coffee plants put in place;
- Three shade structures constructed by members of three associations;
- Eight thousand grow bags filled and arranged in the villages of Dopamai (5000) and Sedemai (3000);
- Three lots of agricultural equipment for the three villages handed over;
- Forty-five participants, including 13 women, trained in techniques of constructing shades for nurseries in the villages of Dopamai and Sedemai;

- Twenty-two participants, including four women, trained in techniques of producing potting soil and filling and arranging grow bags;
- Twenty-two participants, including seven women, were trained in management of associations;
- Six blocks were measured and prepared (two per village) according to the following figures, giving a total area under cultivation of approximately 2 hectares:
  - Kpoda 5727.4 m^2
  - Sedemai 7713 m^2
  - Dopamai 6413 m^2
- The 28,000 potting bags remaining for the three villages have been filled and placed in the nursery;
- Thirty-six polytunnels have been constructed in the nurseries in the three villages;
- Ninety sacks of chicken manure have been purchased and transported to the three sites (30 for each site);
- Planting of cuttings from 36,000 coffee plants (RC2) in each of the three villages;
- Installation of an alternative system of FFSs in the three villages;
- Purchase and transport of seeds, including:
  - 87 kg of hâtif variety cow peas
  - Six 50 kg sacks of ginger
  - Six soup spoons (local measure) of demon variety chilli
  - 312 kg of local variety chick peas
- Thirty notebooks and three large registers were purchased for the three communities to support the setting up of the FFS groups;
- Drafting of statutes and rules of procedure for FFS groups in Dopamai and Sedemai. The different points have been discussed with all three villages, and statutes for Kpoda are now being drawn up;
- Design and installation of six identification signs and 89 tags for the FFS coffee nursery;
- Three modules have been drawn up for the FFS (bio pesticides, setting up and maintaining nurseries and market gardening methods);
- ToRs for the training of agricultural group participants in good management have been drawn up; and
- Ten kg of insecticide (Furadan) and fungicide (Mancozeb) and 6 litres of other insecticide has been purchased for the three villages and handed over to the three farmer groups.

Figure 55. Polytunnel at Kpoda

(Photo courtesy of T. Koighae)

Six written agreements have been drawn up to provide land for the siting of the FFS and the agro-forestry nurseries by the communities in the three villages. Establishing these documents will avoid any conflicts that might arise during the implementation of this project. The FFS and the coffee nurseries are closely monitored, and as per the August 2019 report the plants are in excellent condition.

September 2019 saw a total of 116 people, including 75 members of the three beneficiary groups of the project trained in the use of biopesticides. A range of products with the properties of insecticide and fungicide were inventoried and made available to beneficiaries. The training is timely, as some fungal diseases and attacks have been reported in each field. However, the FFS plots are well maintained, and all varieties of eggplant are in the production phase.

One hundred t-shirts were made and distributed to the three groups to increase visibility of the FFS agricultural activities.

In Liberia, the 2017 FFS participants, supported by FFI and SADS (with funding from NORAD), held their graduation on March 27, 2019. A total of 198 farmers graduated (105 females and 93 males). Graduation start-up kits have been distributed to the thirteen 2017 FFSs, including 1 rice thresher, 5 peanut butter processing machines and 7 cassava processing machines. The 2018 FFS students graduated in December 2019, comprising a total of 200 graduates (136 females and 64 males). In the FFS, experimental plots comparing the yield were produced using three farming methods that were established:

1. Conventional—farmland is brushed and cleared, and a specific number of seeds are planted;
2. Traditional—farmland is brushed and cleared, and an unspecified amount of seed is broadcast; and

3. Conservation agriculture (CA)—farmland is brushed and mulched, and a specific number of seeds are planted.

All groups received a graduation package of their choice, comprising of either a water pump machine, cassava processing machine or peanut butter machine. The graduation event in Konia was attended by the county agricultural coordinator and other stakeholders.

3.1.2: Facilitate farmer exchange groups and visits across the ZWW landscape

This activity commenced with the first exchange visit in September 2019. Six persons were on the team, including Bill T. Kollie (agricultural assistant, FFI), Dorborson Zaza (field officer, SADS), Fayiah Taylor (mechanic driver, FFI), Subah Saywala (lead farmer, Wuzubeh FFS, Goyala), Kebeh Karsor (assistant lead farmer, Wuzubeh FFS, Goyala) and Wolobah T. Keleko (working chairman, Wuzubeh FFS, Goyala) from Wonegizi. In Guinea, 34 people took part in the event. The following is from the field report submitted by Bill T. Kollie (agricultural officer, FFI) about the first exchange.

The team were received at the Fassankoni border by FFI Guinea, and a formal introduction of the group was done by Barre Koivogui, Ziama Forest site manager at the Commissioner's Office in Fassankoni. During this session, the commissioner wholeheartedly welcomed the group. Bill T. Kollie, on behalf of the Liberian delegation appreciated the commissioner for the warm welcome bestowed and also introduced each of the team members to the FFI Guinea team and the Fassankoni commissioner. The itinerary of the visit was read by the Ziama Forest site manager before the group headed to Kpoda, where a musical prelude of welcoming the farmers (Liberian team) and other dignitaries took place.

Site visitation began with the nearby coffee nursery in the town (Kpoda), where 12,000 coffee robusta cultivar rootstalks were nursed under well ventilated scaffold made with palm fronds, reeds, raffle and polythene sheets (locally-made controlled temperature technique). A brief technical lecture regarding the establishment of the nursery was done by the agricultural extension agent (Theoro Gorzoubale) and supported by the participants of the Kpoda FFS. After the question and answer session, the group then moved to visit the demonstration site (5,724 $m^{2)}$ of the Kpoda FFS where bitter balls, ginger, sweetcorn, eggplant, peanut, upland rice and okra were cultivated under the conventional agriculture method. The Wuzubeh FFS delegation again asked questions after the Kpoda FFS and their field staff gave an overview of agronomy activities of their crops practiced at their site. The Ziama site manager, Mr. Koivogui, asked the two groups of farmers, "What can we do to avoid burning our farms?" The Wuzubeh FFS representatives shared their idea from the Wonegizi REDD+ project by saying, "as for us, we are practicing three different farming methods (conservation agriculture, conventional agriculture and traditional farming) on our demonstration site and we have chosen conservation agriculture to be the best farming method, because there is no burning and then we always obtain higher yields from our crops."

The protocol of group photos was then done. Finally, the entire group departed for Kpoda Town, where a traditional dance was performed. Refreshments were provided and then a white rooster was presented by the Kpoda FFS to the Wuzubeh FFS of Liberia.

Lessons Learnt

The Wuzubeh FFS representatives gave the following as lessons learnt from the farmer exchange visit:

- *Tree crop farming is good for conserving the forest;*
- *Good tree crop nursery is the key for a vigorous move towards establishing a tree crop farm;*
- *Unity is what is holding the Kpoda farmers together because they work in a group to plant each member of the group's tree crop seedlings on their personal farm;*
- *The Kpoda FFS deals with a different plot size (20 x 10 m) while the Wonegizi FFS deals with 10 x 10 m plot size;*
- *Provision of nutrient (manure) to crops is one of the keys for healthy growth;*

- *The authority of the people of Fassankoni and Kpoda are really supportive of the process of building their capacity to conserve the forest. They spent the whole day with us in the sun for the visitation;*
- *The people of the Fassankoni District have respect for their leaders because before starting the tour to Kpoda, we were led to the Commissioner's Office for proper introduction;*
- *Kpoda FFS participants are not really knowledgeable about pest management fully, because they were struggling to identify some pests infesting their crops; however, we shared our pest management knowledge from the Wonegizi REDD+ project;*
- *Kpoda FFS is only practicing conventional agriculture, which is not really a mitigating factor in conserving essential resources like the forest, water body, soil etc.;*
- *The warm welcome received from the commissioner and the rest of the FFI Guinea team showed me that we are working together toward a common goal;*
- *Tree crop farming is the major source of income for the people of Fassankoni and Kpoda;*
- *Underbrushing tree crops is good, because all the tree crops we saw in Kpoda were all underbrushed;*
- *Farming of rice and other crops in young bushes is common in Guinea, and the crops grow healthier just like the primary forest too;*
- *The Ziama site manager interacted with us during the visitation and indicated that the FDA is supportive of the entire process on the Guinea side as compared to the Liberian side;*
- *The skills gathered from the Wonegizi REDD+ project is more advanced than what the Kpoda FFS is receiving. In that, I am practicing three methods of farming while they are only practicing one;*
- *The NORAD project is doing the right thing in Liberia to conserve the forest because we are learning CA, but the Kpoda FFS under the WA BiCC project is only practicing conventional agriculture, which promotes burning and destroying other important resources.*

What was useful about the visit to the Wuzubeh FFS?

- *The idea gathered from the coffee nursery established for the Kpoda group is very good for me and our team in Wonegizi to get involved with too;*
- *The exchange of ideas of farming in the young bush rather than the hard forest was good;*
- *Seeing what my colleagues in Guinea are involved in was very useful, because it has showed us that it is good to travel and see other people's lives so you will care for what you have, even when it is little; and*
- *Recession provided for us was very meaningful.*

Recommendations/Take home message

- *We will sensitize our colleagues to farm in the young bush and avoid breaking down the forest, because we saw farms (coffee, cocoa, rice etc.) cultivated in young bushes in the Fassankoni District;*
- *The WA BiCC project should change their approach of the conventional agriculture method practiced by the Kpoda FFS if they want to curtail climate change;*
- *Two or three days should be allotted for the farmers to stay together in the same place to interact with each other because the one day coupled with travel from far distance creates stress; and*
- *FDA representatives should form part of the farmer exchange visit including the town chief from a community.*

Figure 56. Learning exchange visit at Kpoda farmer field school site (left); Liberian and Guinea farmers group photo (right)

(Photos courtesy of B. Kollie)

An additional three FFS exchange visits were conducted as part of ZWW activities. The target for the project was six exchange visits, however only four visits were completed due to restrictions put in place because of COVID-19.

Guinea lead farmers and Institute de Recherche Agronomique de Guinee (IRAG) staff visited Wonegizi in October 2019. The team was received at the Wonegizi FDA headquarters in Konia before going on to visit the FFS site at Dorzenilor, the demonstration site at Konia and FFS site at Ziggida. The team from Guinea happily said they will replicate the new way of farming, which is CA, in their own locality in Guinea to see if they can achieve better results too, just like what farmers in Wonegizi are achieving with CA.

Wonegizi farmers, SADS and FFI staff visited Ziama farmers in December 2019. The team was taken to Irie to observe tree crop nursery activities, where they discussed the challenges of elephant crop raiding with their peers. The group then visited the FFS demonstration site, where they observed tomatoes, sweet corn and bitter balls (or garden egg) planted under the conventional agriculture method. The team noted the modern irrigation installation, which supplies the tomatoes with water, and wooden boxes for compost preparation. The team visited the FFS members at Sedemai on the second day of the visit, where they observed the coffee nursery and vegetable garden.

Recommendations/take home messages from this visit (as noted in Bill Kollie's report) include:

- *We, the farmers of Wonegizi, need to get involved in tree crop production in order to conserve our forest.*
- *Farmers in Wonegizi need to be busy with their farming activities in order for them to raise higher income.*
- *Secondary forest, including lowland farming, should be encouraged by Wonegizi farmers in order to save the forest.*
- *Farmers in Liberia as a whole should listen to their leaders in order to improve their knowledge.*
- *We farmers should practice what has been taught by the project.*
- *Communities dwellers in Wonegizi should learn to take initiative in maintaining their feeder roads.*
- *We farmers should protect our forest by avoiding hunting, unstainable farming practices or using chemicals which poison us.*

The fourth FFS exchange visit took place in February 2020. Lead farmers and IRAG staff visited the Konia demonstration site before proceeding to Lutisu to spend the night. The group spent the morning at the Lutisu FFS site, where CA methods were demonstrated and discussed. The visitors also stopped at the site of one of the FFS participants, Krubo Korlue, along the main road leading to

Lutisu Town, where she has replicated improved farming methods learned from the FFS. Full details of the FFS exchange visits can be found in the field reports by Bill Kollie (FFI agricultural assistant, Wonegizi).

Figure 57. Guinea and Liberia farmers at the farmer exchange visit in Lutisu

(Photo courtesy of B. Kollie)

3.1.3: Develop and implement sustainable livelihoods assessment and participatory market systems development

Planning for the PMSD TOT workshops in Konia and Sérédou in Q4/2019 started in August. With guidance from Michelle Villeneuve (FFI technical specialist, agricultural landscapes) agricultural staff at both sites conducted preparatory work for the PMSD. This includes working with SADS and IRAG to identify NTFPs and agricultural crops best suited to being developed economically by the communities, and a market selection exercise for the market study report. Potential crops for assessment include coffee and cocoa.

Vanessa Evans (FFI technical specialist, responsible investment) and Kiran Mohanan (FFI enterprise development manager) travelled to Liberia at the end of September to conduct the training. A total of 32 persons were trained (12 in Liberia and 20 in Guinea). The 2-day TOT workshop covered the following topics:

- Introduction to the PMSD philosophy and approach (reinforcing the difference between enterprise development and PMSD approaches);
- Market system brainstorming, identifying criteria/assigning weightages to the three products identified;
- Market system selection (selecting one of the three products identified to focus on);
- Preliminary market mapping, and identification of the missing information that needs to be collected; and
- Establishing an action plan for the organization of the participatory workshop (convening the market actors for the product chosen) to be scheduled at a later date.

3.1.4: Conduct sustainability assessment of proposed use of natural resources

FFI is supporting 14 communities in and around the Wonegizi forest in Lofa County and three communities in Ziama to reduce deforestation and develop sustainable livelihoods. This work includes PMSD to design inclusive market programs that reduce poverty on a large scale and protect the environment. Experience has shown that participatory approaches like PMSD that engage market stakeholders enable us to design programs that are based on a holistic understanding of the market—interventions that are targeted at unlocking blockages and opportunities in the market are most likely to enable us to deliver impact at scale.

To support this work, FFI contracted four market development interns in 2020 (two each in Liberia and Guinea) to carry out research on the sustainability of production methods, value chains and local and national supply chains for the four priority products identified in this landscape: cocoa, honey, bush pepper and ginger. The interns in each landscape focused on one of the following topics:

1. Assessing the sustainability of the production and/or harvest of cocoa, honey and bush pepper in selected project communities; and
2. Investigating the value and supply chains of cocoa, honey, bush pepper and ginger, with selected project communities in Lofa County/Ziama and nationally.

Sustainable production and/or harvest assessment (by Andrew M. Gonkarnue)

Objectives of the sustainable production/harvest research include:

a. Cocoa Farming
   - Conduct assessment of the sustainability of the current production methods of cocoa in Wonegizi against relevant environmental and socio-economic criteria of the Rainforest Alliance Standard through key informant interviews;
   - Identify the key gaps between current production methods and Rainforest Alliance Standard requirement and make recommendations on how to achieve the improvements needed; and
   - Identify agricultural, forestry and socio-economic issues that would be caused by increasing production to be addressed in future interventions, and begin to match potential solutions to those problems.

b. Honey and Bush Pepper Harvest
   - Conduct assessment of the sustainability of the current wild harvest methods for honey and bush pepper in Wonegizi against relevant environmental and socio-economic criteria of the FairWild Standard through focus group discussions;
   - Identify the key gaps between current production methods and the FairWild Standard requirement and make recommendations on how to achieve the improvements needed; and
   - Identify agricultural, forestry and socio-economic issues that would be caused by increasing harvest or developing production to be addressed in future interventions, and begin to match potential solutions to those problems.

Due to limited time for the studies, only three of the 17 impacted communities in and around Wonegizi were selected to assess production sustainability of the selected products. Key informant interviews and focus-group discussions were used to gather data.

Results from the assessment show that wild collection of honey and bush pepper are not sustainable. Trees hosting the roots/stems of the bush pepper are cut down for ease of access for collection/harvesting of its seeds. Similarly, honey collectors advised that young trees are unintentionally destroyed when they cut down/fell the middle/larger trees to extract or collect the honey.

Recommendations include:

Cocoa

For the sustainability of cocoa production in the 17 project communities in and around the WPPA in Lofa County to develop sustainable livelihoods, the existing farms should be accurately measured and contained and no further clearing for expansion of farms conducted. Farmers should be fully supported in terms of capacity building and knowledge (training), inputs (e.g., tools and seeds/seedlings) and the construction of storage and processing facilities. In addition to the above, these farmers should be properly linked to service providers, extension/trainings, financial institutions and/or microfinance institutions—credit unions, savings clubs, commercial banks and the CDA of Liberia, as well as buyers, processers and exporters for this product.

Bush pepper

Regarding the sustainability of bush pepper, commonly referred to as black pepper, used for spice and medicinal purposes, this is a plant of the humid tropics that requires high rainfall and humidity. The hot and humid climate makes the WPPA an ideal location for bush pepper cultivation. Recommendations for sustainable production include:

- Due to its climbing nature, bush pepper wild collectors/harvesters should be identified, registered and trained to cultivate it sustainably and by means of a mixed cropping system of farming with tree crops and/or timber species for support, and to promote agroforestry practices.
- Eager and community wild collectors/harvesters should be supported by provision of its agronomical cultivation, and propagation methods standardized.
- Train interested community wild collectors/harvesters to prepare and apply manures (e.g., well rotten cow dung or compost) and inorganic fertilizers.
- Train wild collectors/harvesters about irrigation (watering), weed control, pruning, pest and disease management (of bush pepper plants in field), harvesting, processing/post-harvest handling/management and marketing of this product

Honey

A number of challenges have been recorded, most notably, the inadequate knowledge on the part of the community in modern beekeeping and the real value of honey and other bee-related products. Additionally, lack of knowledge on the existing national policies for the sustainable harvest/collection of NTFPs (e.g., honey, bush pepper etc. in Liberia) and lack of well-organized community groups/associations for beekeeping are a few of the issues that need to be addressed in future interventions for product sustainability. Honey beekeepers should be trained and provided with the modern technologies such as hives and PPE for sustainable production, while at the same time properly linking honey producers to the market for the product and by-products real value.

Value and supply chain assessment (by Alieu M. Fofana, Abednego Mehn and Kiran Mohanan)

Objectives of the value and supply chain research include:

- Study current market system for selected commodities in the project community;
- Access opportunities and bottlenecks along the value chain for cocoa and honey;
- Provide information for livelihood and income-generating activities of project communities; and
- Establish how support to improve the market for the commodities could reduce pressure on the WPPA.

Focus group discussions were conducted with honey collectors in Vetesu, Lofa County. It was established that honey has huge income-generating potential, but the lack of training for those interested in honey production is the main barrier, followed by the lack of key actors within the value chain functions. It is therefore a very good idea to invest in PMSD to ensure the honey value chain is sustainable.

A literature review and interviews were conducted with producers, buyers and traders of cocoa in Lofa (John's Town and Konia) and Monrovia to understand the gaps and constraints in the supply trade. Challenges with cocoa include:

Producer level—lack of awareness about farm economics, low price for cocoa and limited knowledge of safe processing, storage and traceability.

Buyer level—not much is known about the availability of cocoa, the price and when cocoa is really in demand. The price is mostly determined by buyers and not by market forces. Limited access to extension services and finance to boost production is a serious bottleneck. Bad roads are another serious bottleneck, as well as fluctuating coca market price and unorganized market place.

Trader level—supply from counties is still low, considering the number of buyers. This suggests production is still low and that there are markets if farmers are able to scale up production. This is due to numerous production challenges, such as lack of access to finance, inputs and extension services. The value chain needs upgradation to scale up volume and quality of production.

The study provides the following recommendation for the cocoa PMSD going forward:

1. Training farmers on better management practices

There is an urgent need to support farmers in improving the volume of cocoa production. The young generation after the civil conflicts and subsequent displacement are not aware of traditional cocoa production methods. The elder generation haven't had a chance to train the new generation of farmers in production methods. Thus, it is crucial to design programs that combine traditional knowledge with modern agriculture production techniques, with a focus on climate-smart production methods. There is a need in specific areas such as IPM, biopesticides and conserving wild pollinators. Farmers need training in farm economics to help them understand the cost involved and to help negotiate a better price with traders. This will professionalize the agriculture production systems in Wonegizi.

2. Training in cocoa bean quality improvement

The quality of cocoa bean is important in attaining a better price in international markets. Farmers in Wonegizi need training in improving the cocoa bean processing technique to reap the benefits of a better price for high-quality cocoa. This needs training and cooperation with buyers. Local buyers need to acknowledge the effort required for quality improvement and reward better prices.

3. Access to agri-input supplies, credit facility

It is unrealistic for NGOs and donor funds to support farmers with agriculture inputs such as seedlings and equipment long-term. Thus, to ensure the sustainability of the project impact, it is important that the PMSD approach brings in agriculture input suppliers that are then directly linked with farmers. This will ensure farmers have access to these crucial much-needed inputs to scale production. Access to affordable credits is equally important, ensuring farmers are able to purchase inputs as needed and that such financial support is not always reliant on donor funding.

4. Building farmer-buyer relationship

The current cocoa supply chain is unorganized, and there is no coordination among the buyers and farmers. Such collaborations are needed in improving quality aspects and developing traceability systems to understand the origin of cocoa supplies. Organizing farmers under an association/cooperative can help collectively negotiate the price with buyers, and also buy agri-inputs

in bigger volumes that reduce prices. Assessing feasibility of farmer collectives will be a suggested next step under the PMSD.

5. Developing safeguards to reduce deforestation risk

The market demand for cocoa is increasing, and the farmers have already reported 88% of them cleared forest for cocoa plantation. Thus, there is a risk in the future for the demand for cocoa to increase and farmers clearing more forest for cocoa plantations. Appropriate safeguards need to be developed with farmer consultations. Price incentives could be one, where cocoa is sustainably produced from Wonegizi, faring better in the niche fair trade markets.

The role of protected areas in the conservation of non-timber forest products

The text below is taken from an academic thesis by David Dennis, MSc candidate, at the Science-Policy Interface on Biodiversity & Ecosystem Services (SPIBES) for Sustainable Development Programme, Universite Felix Houphouet Boigny (UFHB), Abidjan, Côte d'Ivoire.

The aim of the study is to evaluate benefits provided by Garcinia kola and to determine the abundance and distribution of the species in and around the proposed protected Wonegizi landscape to promote its sustainable use. Results from a recent High Conservation Value (HCV) survey showed that G. kola is one of the most harvested NTFPs in Wonegizi due to its high socio-economic and cultural value to local populations (HCV Report, 2018). These use values include cure for pressure, yellow fever, as an aphrodisiac and in traditional marriage ceremonies. Such importance has increased the demand for the resource and made it an expensive commodity on the market.

Specific objectives of the study were as follows:

- *To generate perceptions of local population on the uses and harvesting methods of G. kola around Wonegizi.*
- *To determine the abundance and distribution of G. Kola within and outside the core zone of Wonegizi landscape.*
- *To evaluate existing national policies on harvesting and trade of NTFPs linked to their sustainable use.*

An interdisciplinary research approach including the inventory of G. kola using GPS, individual and focus group interviews in seven adjacent communities, covering 70 households, to assess the impact of the local use of G. kola on its abundance and distribution, and desktop study of existing conservation policies were employed.

At time of writing, David's draft thesis has been submitted to the thesis committee at UFHB, ready for defense, and will be published once finalized.

3.4 OBJECTIVE 4: ENCOURAGE LEARNING AND SHARING OF INSPIRING KNOWLEDGE, RESPONSIBLE ATTITUDES AND BEST PRACTICES THAT STRENGTHEN LOCAL INTERVENTIONS AND ENHANCE NATIONAL OR REGIONAL POLICY INITIATIVES.

Context

Liberia and Guinea have a long and important history of collaborating on natural resources management and other economic and development issues. Both countries face practical challenges as they endeavor to work together on transboundary initiatives, including language and differing priorities on the part of government. Therefore, it is important to encourage lesson sharing across the landscape and for FFI to develop an outreach strategy for the project, using appropriate tools and messages for different levels of audience from the local/subnational to the national/regional level.

3.4.1 ACTIVITY 4.1: SUPPORT COMMUNICATIONS AND BEHAVIOR CHANGE

4.1.1: Develop a behavior change communications strategy

FFI held an internal workshop to develop a joint NORAD and ZWW communications strategy in October 2018. The first step was for the team to conduct an analysis of the political, economic, social and technological factors or issues that may impact the communications strategy (referred to as a PEST analysis) and then identify how the project can address those issues. For example, the low literacy rate was identified as a social factor that could impact the communications strategy, and the group agreed that one way to overcome this is to create understandable messages that take into consideration the literacy rate.

The second step was to complete a competitor analysis of other entities in the landscape that may impact the communications strategy. There are a number of organizations working in the same landscape that have an overlap with NORAD and ZWW activities, and this may present a challenge with regard to confusing messages and expectation management.

The team also competed the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis:

- Strengths—positive characteristics within the project that are an advantage when communicating;
- Weaknesses—negative characteristics within the project that are a disadvantage when communicating;
- Opportunities—positive external factors that can be taken advantage of when communicating; and
- Threats—negative external factors that can hinder your success when communicating.

The team planned to meet the next day to complete the stakeholder analysis, however the meeting was postponed. The team met again in March 2019 to complete the stakeholder analysis and develop ideas on messaging.

In between finishing the internal communications workshop, FFI participated in the WA BiCC Grantees Learning Event in December 2018. This involved a 3-day skill building cafe. The event covered a number of useful topics including, but not limited to, what is a story, what is a change story, know your audience, social media best practice, document production protocols, photography and linking communication to monitoring and evaluation. The skill building cafe was very interactive. Participants were required to select three stories and then pick one to present to the group, as well as perform a role play of a story. On the last day, participants presented their communications strategy for the landscape they are working in.

<u>Outreach activities carried out during the International Day of Forests</u>

FFI was invited by the FDA to participate in the Liberia Planning Committee of the IDF 2019. Institutions on the planning committee included the FDA, EPA, WA BiCC, FFI, and SCNL. Other partners were also invited by the committee at different stages to support the planning of the event. During the second planning committee, two sub-committees were formed—a program planning sub-committee and a logistics sub-committee. FFI was appointed the chair of the program planning sub-committee. Between February and March, several planning meetings were held (including at least two joint program and logistics sub-committee meetings) and two site visits by the planning committee to Gbarnga were made. The IDF occurs every March 21st, and the global theme for 2019 was "Forest and Education." The national theme "Education for Sustainable Forest Management" was agreed during the second meeting of the planning committee. A number of outreach materials were produced for the event, including t-shirts, face caps, flyers etc. A forest and protected species mural was painted on the wall of a junior high school on the Gbarnga Highway, and a radio talk show was also held on the morning of the event.

The IDF was held in Gbarnga, Bong County, Liberia, on March 21, 2019. The event consisted of an outdoor and indoor program. The outdoor program included the forest and protected species mural painting and a parade, bringing together people from government, civil society, international partners, schools and community representatives to march along the Gbarnga Highway, distributing flyers to passers-by and promoting the importance of Liberia's forests. High points of the indoor program included:

1. Special remarks by chairman of the board of the FDA Hon. Harrison Karnwea and the FDA managing director, represented by the deputy managing director of operations Hon. Joseph Tally;
2. Remarks by government, communities, development partners, civil society, international partners etc.;
3. A key note address titled "Forestry Education in Liberia: Lessons for Sustainable Forest Management in the 21st Century" was given by Prof. John Woods, associate dean of UL's Forestry Department and former managing director of the FDA;
4. Presentations by National Forest Programs—the National REDD+ Strategy and National Forest Inventory (NFI), presented by REDD+ national coordinator Saah David and national coordinator of the NFI James Kpadehyea, respectively.
5. Honoring of three forest heroes—Dr. Ophelia Weeks, president of UL, Cllr. Negbalee Warner, dean of UL's Law School, and Mr. Jacob Fornnorh, a prominent citizen of GRNP communities;
6. Presentation of certificates to six forest ambassadors, including the following institutions and individuals:
    a. Grand Cape Mount Community, Gbomboja;
    b. Bong County Community, Gbaota;
    c. Joint Community Forest Management Body (Blei), Nimba County/ENNR;
    d. Gayflor Vamawu, general town chief in Ziggida, Lofa, Wonegizi PPA;
    e. Mayer Jaygbah, paramount chief, Upper Wedjah, Sapo National Park; and
    f. SDI.
7. Essay competition between three high schools in Gbarnga. Title of essay—"The Role of Education in Addressing Deforestation and Forest Degradation in Liberia"; and
8. Debate between Nimba County Community College and Cuttington University. The debate topic was: "Climate change is one of the most important challenges facing this generation. Which of these two sectors—agriculture and energy—would contribute more practical solutions towards the reduction of greenhouse gas emission in Liberia?"

The winners of the essay and debate competitions were also presented prizes.

The event was covered by the media and went a long way to promoting Liberia's forest among the general public. Over 200 people participated in the event.

Figure 58. Celebrating the International Day of Forests in Gbarnga, March 2019

Figure 59. Forest and protected species mural painted on the International Day of Forests in Gbarnga

Outreach activities carried out during the International Day of Biological Diversity

FFI participated in planning meetings organized by the EPA to celebrate the IDBD. It was agreed that the local theme would be "Our Biodiversity, Our Future," to highlight the threat of the IWT in Liberia. FFI contributed to the design and production of outreach materials for the day, including 400 protected species t-shirts, 3 banners (printing covered by LCRP), 1000 fliers (detailing protected species and the 2016 wildlife law penalties) and 100 protected species calendars. FFI and LCRP wrote a joint article about IWT that was published in the *Independent Enquirer* and *The News*, as well as online (see Appendix B). A billboard of the protected species of Liberia was designed and locations scoped, however the process was delayed due to ongoing discussions with Monrovia City Corporation regarding tax for putting the billboards up.

Three radio shows were organized, including the May 20th ELBC *Super Morning Radio Show*, wherein guests included Michael Garbo (SCNL), Shadrach Kerwillain (FFI), Jenny and Jim Desmond (LCRP) and Annika Hillers (WCF). The focus of the show was to introduce the IDBD and the threat of the IWT to Liberia's biodiversity. The May 21st ECOWAS Palava Hut program guests included Comfort Sakui (FDA), Abednego Gbarway (FDA) and Shadrach Kerwillain (FFI). The focus of the show was the IDBD, Liberia's biodiversity and protected species and the 2016 wildlife law. The May 22nd ELBC *Super Morning Radio Show* guests included Comfort Sakui (FDA), Abednego Gbarway (FDA), Levi Pia (EPA) and Michael Garbo (SCNL), who were there to talk about the IDBD, the 2016 wildlife law and Liberia's biodiversity and protected species. The intention had been for the FDA, MD and DMDO to appear on the May 22nd show, but they were out of the country.

FFI attended the IDBD event organized by the EPA at the sports stadium on May 22nd, attended by around 100 people. Participants conducted a march outside the stadium and handed out fliers and t-shirts to members of the public as they passed in their vehicles on the road. A panel discussion took place as well as a cultural theater show. The event was attended by students from the Kings and Queens school and one student from Sotismah School.

Figure 60. Handing out fliers to the public passing the stadium in Monrovia to raise awareness on the International Day of Biological Diversity

(Photo courtesy of D. Barolle)

FFI also organized two additional events. One was a showing of an episode of the David Attenborough documentary *Our Planet* about the impacts of climate change, followed by a discussion about the show at the UL's Fendell Campus Auditorium. The event was attended by over 200 students. Secondly, a presentation about the importance of biodiversity was developed and sent to LCCC with 100 t-shirts and 150 fliers. Students who had completed the biomonitoring training gave the presentation, and the activity continued with the students creating awareness in a Voinjama market by handing out fliers and talking to the public about protected species and the wildlife law.

Figure 61. Professor John Woods facilitating the discussion about climate change at the University of Liberia on the International Day of Biological Diversity

(Photo courtesy of C. Cassell)

<u>Outreach activities carried out during World Chimpanzee Day 2019</u>

World Chimpanzee Day this year was celebrated in Paynesville, Monrovia. As part of the activities, FFI funded a radio show on ELBC, designed and printed 250 t-shirts (100 for the main event at the Duport Road Park, 100 for LCCC and 50 for judiciary and enforcement agencies in Lofa County). We also provided refreshments and supported the live painting of a chimpanzee mural at the site of the event under a separate grant.

Biodiversity officer of ZWW George Allison conducted awareness at LCCC, attended by 86 persons on July 31st. A presentation and films about chimpanzees were shown. T-shirts were also distributed to the students as part of the event.

Figure 62. George Allison and Lofa County Community College students celebrating World Chimpanzee Day

(Photo courtesy of G. Allison)

Outreach activities carried out during Ziama soccer matches

Four soccer matches have been organized this year between the Ziama rangers and local communities. Before the match and during half-time, a program of environmental education touching on the protection of the reserve is delivered to the spectators. This strategy is proving successful with regard to the number of people mobilized to attend these events.

On May 4th, the rangers (the team are called Les Elephants de Ziama) played Kpoda, and 800 spectators were estimated to have attended from four different villages. The score was 2-2. In June, the rangers played the Dopamai team and, again, the score was 2 all. More than 350 people, including women and children, attended the match and were sensitized on the protection of the forest and its wildlife, as well as the involvement of communities in the management of the reserve. In July, rangers played Boo community team. Over 500 members of the community attended, including large numbers of women and children. Before the match and during half-time, spectators were educated on protecting the forest and its wildlife, as well as the importance of the implication of communities in the management of the reserve.

World Elephant Day was celebrated in Sérédou in August. This celebration was organized around a gala match that included eight soccer teams. A trophy was awarded to the winner. This event mobilized over 700 people including children, women and men around the conservation of elephants.

Figure 63. Centre Forestière de N'Zerekore rangers football team Elephants de Ziama and community football teams on World Elephant Day

(Photo courtesy of T. Koighae)

Figure 64. The winning soccer team on World Elephant Day

(Photo courtesy of T. Koighae)

Farmer field roundtables

Five different messages covering good agricultural practices for farmers around Ziama were validated through a workshop in 2019. This workshop mobilized 10 participants, including local partners. The messages that were covered included: the importance of biopesticides, the impacts of chemical pesticides on the environment, the importance of legume crops in soil fertilization, the importance of crop rotation and sustainable agricultural practices.

The messages were originally intended for radio, however the radio mast at Macenta was not operational, therefore the team played the messages from a PA system mounted on a vehicle and the agricultural coordinator answered questions from the crowd. This awareness campaign was conducted in 23 communities and reached a total of 6145 persons, of which over 50% were female.

Figure 65. Residents in Yomai listening to messages about responsible agricultural practices

Ziama management plan outreach

Following the adoption of the revised Ziama management plan at the end of 2019, the CFZ implemented a series of meetings with Ziama communities. A total of 144 participants attended the meetings, which were headed by Camara Watta (directice generale, CFZ) and team.

The overall goal of the workshop was to inform and sensitize interest groups on the five rural communities bordering the reserve on the approval of the revised Ziama management plan and to ensure their involvement in its implementation.

More specifically, the objectives of the meetings were to:

- Present the summary of the Ziama management plan (history of the development process, its vision, mission, programs and its operational goals);
- Inform stakeholders about the signing of the ZWW bilateral agreements between Guinea and Liberia;
- Explain the activities compatible with the preservation of the reserve, the right of use and the duty to contribute to the management of a biosphere reserve (e.g., case of the buffer zone);
- Present and distribute copies of the new wildlife codes to communities;
- Explain to communities the benefits they can derive from the management plan; and
- Distribute posters on fully protected species and the negative effects of the use of herbicides.

The workshops were held in plenary in the youth centers in the five rural communes around Ziama. All items on the agenda were explained in detail in all languages, including French. At the end of the explanations, the discussions were opened to clarify any gray areas. The new zoning map was used to serve as a basic tool for detailed explanations, which facilitated understanding regarding the different zones of the reserve (buffer, transition and central).

The workshop came at the right time and allowed neighboring communities to be widely informed about the management of the reserve, but also to know what is allowed and what is prohibited. Each community now knows at what level it is involved in the sustainable management of Ziama. The communities recommended that this awareness is carried out in all the neighboring communities and in other communities in or beyond the transition zone.

Figure 66. Ziama management plan awareness: Centre Forestière de N'Zerekore, Fauna & Flora International and participants in N'Zebela

Wildlife and forest codes awareness

The CFZ, with support from FFI, conducted awareness about the wildlife and forest codes in 32 communities March 11–23, 2020, engaging 1036 participants.

The objectives of the awareness were as follows:

1. Allow all neighboring communities, partners and stakeholders involved in the sustainable management of natural resources to be informed of the regulation of wildlife and plant species;
2. Know the rights of use of the resources, the prohibitions and the penalties that result from the non-respect of the application of these codes; and
3. Understand the benefits of sustainable conservation of biodiversity resources and the disadvantages of deforestation.

The awareness was carried out by six Ziama agents made up of officers, judicial police officers and curators from the Ziama site, divided into three. The awareness consisted of presenting these legal documents in plenary during the community meetings organized for this purpose.

With regard to the dissemination of the codes and the presentation of the activities prohibited in the reserve, in all the villages visited, the communities recommended the following:

1. Support in animal husbandry to avoid going to the reserve to hunt;
2. Support for the development of income-generating activities to avoid going to farm on the reserve; and
3. Continue to do awareness sessions on the law.

Other communications activities, Guinea

- Production of a public games show at Irie on the consequences of deforestation;
- Training of IRAG and CFZ partners for communication and awareness-raising techniques. FFI Guinea organized training for 16 participants from the CFZ, IRAG and FFI on communication and sensitization techniques. The training (theory and practical) was held at the FFI office and was delivered by a consultant who is an expert in communications. Topics covered included communication methods in general, methods of successful awareness and written communication (e.g., how to produce a report and a field report);
- Identification of seven themes for the design and production of messages in the villages surrounding Ziama on agriculture and the sustainable use and conservation of natural resources; and
- Installation of 10 signs on the prohibition of herbicide use and three signs on the protected species of Guinea in and around Ziama.

ZWW project reporting activities

Both the Liberia and Guinea teams organized presentations to report back to stakeholders, specifically regarding the results of the rapid biological assessments on March 13 and March 31, 2020 respectively.

The FDA requested that ELRECO and FFI organize a day of presentations, as both entities had reports to make. ELRECO presented first with a report on their interim project results and an introduction of Human-Elephant-Conflict Mitigation Strategy for Liberia. Sam Gregory gave a remote presentation (due to COVID-19 travel restrictions) on the findings of the LLA, explaining how it should be used as a decision-making tool. The results of the rapid biological assessments were then presented by ELRECO (large mammal surveys in Wologizi and Wonegizi) and Philip Tem Dia (FFI biodiversity technical specialist, ZWW). A total of 35 representatives attended from the FDA, MIA and the NGOs.

The FFI Guinea team had originally planned to present the findings of the rapid biological assessments at a meeting in Conakry, however, due to COVID-19, the team decided to hold a smaller meeting with stakeholders in N'Zerekore in order to observe the precautionary measures put in place by the Guinea government. A total of 15 CFZ staff and botanical specialist Moussa Diabate (the consultant who led the botanical surveys) attended the presentation.

Figure 67. Stakeholders at the Fauna & Flora International Ziama-Wonegizi-Wologizi rapid biological assessments presentation in N'Zerekore

Protected species billboard and other awareness materials

A billboard featuring the protected species of Liberia was installed at Capitol Hill in Monrovia on April 3, 2020. This was one of the final activities under this grant and a nice achievement for the team after trying for a year to get the billboard in place. In addition, awareness materials designed in 2019 were updated following comments from USAID/WA BiCC on the billboard text, including: protected species of Liberia poster, protected species and wildlife law flier and protected species foldable leaflet. One hundred protected species posters and 100 protected species and wildlife law fliers were provided by FFI for the World Wildlife Day celebration organized by the FDA on March 3, 2020. The event was officially launched at ELWA junction, followed by outreach at Red Light market.

ELRECO developed an informative poster about the forest elephant, featuring key facts about this wonderful species and highlighting it as part of Liberia's natural heritage. FFI and LCRP approached ELRECO with the idea to design a collection of species posters under Liberia's natural heritage heading. The content for a chimpanzee poster was developed by LCRP and FFI, and ELRECO designed the poster using the original elephant poster as a blueprint (see Appendix 3).

Figure 68. Protected species of Liberia billboard installed at Capitol Hill, Monrovia

4.0 ENABLING ENVIRONMENT/POLICY

The main factors that enabled conservation and livelihood successes are as follows:

A strong relationship and good rapport with the FDA and CFZ has been fundamental to the success of this project. The FDA provided technical guidance and advice throughout the duration of the project and helped to ensure we followed government protocols at all times. Similarly, Madam Camara Watta (directrice generale, CFZ) led on a number of projects and provided technical input on proposals and key documents. We rely on their support to ensure the success of our activities.

Study trips and exchange visits were invaluable with regard to knowledge exchange, garnering support for the project and FFI in general. Participants were able to gain a different perspective, compare successes and challenges and learn from the experiences of their peers, which is a very effective way of learning.

Liberia stakeholders have developed a strong overarching participatory approach over the years for their activities. Excellent examples of this are the achievements to date under the SWG, LESC and at events such as the Pygmy Hippopotamus Regional Action Planning Workshop, the National Chimpanzee Action Planning Workshop and the National Strategy Development Workshop for Combatting Wildlife Crime. The collaboration between the different entities ensures proper coordination, as more is achieved when everyone works together. In addition, the NGOs present a united front, which has been helpful in encouraging government partners to be more effective. The level of collaboration has been noted and commended by partners from other countries at international and regional workshops, and many are keen to replicate the model not just at a national level but at a regional level too.

Local governance and organization/grouping of communities in Ziama is a great step towards ensuring the involvement of the communities in the effective management of the reserve and the sustainable management of their natural resources. Similarly, training and ensuring community representatives benefit from park operations through involvement in monitoring activities (e.g., community auxiliaries have augmented FDA manpower on the law enforcement and biomonitoring teams) have helped to increase understanding and patronage of the PPA. Support from local communities that surround the PAs has been fundamental to successful implementation of activities, which was made possible thanks to our inclusive approach of ensuring community buy-in through extensive community consultations.

Mass sensitization about sustainable agricultural methods in Guinea and continued awareness on the value of protected species and benefits of biodiversity in Liberia have increased the general public's understanding and receptiveness to changing their behavior.

The sheer drive, passion and commitment of FFI Liberia and FFI Guinea program staff and the support from the UK team ensured the successful implementation of these activities on the ground. Everyone was willing to support each other to achieve the desired results of the project.

5.0 LESSONS LEARNED, CHALLENGES & OPPORTUNITIES

Full collaboration with the FDA and partners and engagement of other relevant government officials has really helped to ensure the success of this project with regard to stakeholder buy-in and implementation. Support for intra-governmental collaboration has also played an important role and will help to ensure the impact of the project in the long-term as these networks continue to be strengthened. For example, the MOJ and FDA are now working closely together on wildlife crime issues (as a result of LESC support), and the first wildlife law training for judiciary and enforcement agencies was led by the FDA and supported by the MOJ and Transnational Crimes Unit. Increased collaboration and coordination between the FDA and other enforcement agencies can only help to improve application of the law. The realization that cruelty to animals and wildlife crime is covered by the revised penal code in Liberia (as advised by FDA lawyer Atty. Yanquoi Dolo) was welcome news for many partners, as it means stronger penalties can be handed down for wildlife crime. The fact that almost no one at the wildlife law training in Lofa County was aware of this piece of information was very telling and partly explains why arrests brought by the FDA have been disregarded or not taken seriously in the past. The general view that the National Wildlife Conservation and Protection Area Management Law is an "FDA law" has also impeded wildlife law cases. Understanding of due process alone by FDA rangers and joint security staff should help to improve the number of successful prosecutions.

It is interesting to note that the CFZ initiated a meeting with police to understand how the penal code and criminal procedures of Guinea can support them in enforcing the forestry code and wildlife protection code. This, again, underlines the importance of intra-agency coordination to combat wildlife crime. The facilitation of regular engagement between the FDA, CFZ and the respective security agencies is essential if wildlife crime is going to be properly addressed both nationally and at a sub-regional level.

Due to the change in the Liberian government as a result of the 2018 elections, there is a need to lobby the current administration and to demonstrate conservation as a viable option that can contribute to the national economy. REDD is gaining more traction among senior officials in Liberia as the REDD Technical Working Group and EPA step up their engagement activities and highlight the potential benefits REDD could bring to Liberia as the country with over 40% of the Upper Guinean rainforest within its boundaries. Communicating the achievements of the Wonegizi REDD+ pilot project is key to garnering support at all levels for this approach. Wonegizi becoming a REDD+ site will also serve as motivation to the CFZ, and it is highly recommended that a REDD feasibility study is conducted for Ziama and Wologizi. For REDD to really benefit either country, economy of scale needs to be achieved.

Study tours, learning exchanges and conferences provided the opportunity for knowledge sharing and for participants to gain first-hand experience in conservation and sustainable management in other countries. Participants developed an improved appreciation of the potential benefits of conservation and ecotourism, so much so that one senior official declared herself a conservationist and vowed to push conservation forward on the government agenda. The role of REDD in providing important livelihood support for communities to achieve conservation goals was noted by almost all of the participants who took part in the knowledge exchange trip to GRNP. Other initiatives in GRNP that have the potential for application in Liberia are joint patrols with armed police, as an alternative to arming park staff and an incentive scheme for law enforcement rangers. However, the FDA is making arrangements for its rangers to be armed. Formal learning occasions, such as the WA BiCC Grantee Learning Events provided a valuable opportunity for knowledge sharing between implementing partners at national and regional level, and even within organizations.

The rapid biological assessments have provided vital scientific evidence that proves beyond any doubt that the Wologizi PPA is of outstanding value for conservation in Liberia and is of

international importance. This information has been presented to the FDA and will support future efforts to propose Wologizi for gazettement as a formal PA. We have recommended to the FDA that these efforts be set in motion as soon as possible, starting with the posting of rangers at this currently unprotected site to enable commencement of law enforcement, given the high level of threats from hunting. Also, continued engagement with communities is needed to raise awareness about the wildlife law and protected species. Radio shows were used to create awareness during this grant and people had the opportunity to call in and ask questions and seek clarification about laws relating to wildlife, which many were not aware existed. Public outreach using radio and other forms of mass media, including mobile broadcast of pre-recorded messages, proved very effective during this grant and should be encouraged/continued.

Ziama's designation as a MAB Reserve has also been reinforced as a result of the assessments. Following recommendations from the rapid assessment program (RAP) surveys, additional surveys are required for some taxa at both sites due to the limited survey time and challenges accessing certain areas (e.g., high-altitude sites in Ziama).

Working towards the formal gazettement of Wonegizi has provided numerous lessons. This site will be the first to be gazetted since the signing of the new LRA in 2018; hence the gazettement process has been the most extensive so far for a PPA in Liberia. Following a thorough FPIC process has been essential in obtaining community buy-in. There is also a need to develop a more detailed protocol for the gazettement of PAs in Liberia, as there is no documented procedure currently available. FFI has developed a draft protocol that will be updated as the process for Wonegizi is completed. Lessons from Gola and Grebo-Krahn PAs highlighted the importance of meticulous documentation throughout consultations.

As regular law enforcement activities have gotten underway and collaborative efforts to address wildlife crime at both the national (through the LESC) and regional levels have ramped up, the number of confiscated animals has increased. In Liberia alone, at least 30 orphan chimpanzees have been confiscated by the FDA over the project period (with more orphans known about and in need of confiscation) and are now at the LCRP sanctuary. This underlines the need for donors and NGOs to include sufficient funding for wildlife sanctuaries as part of supporting effective law enforcement.

Input at the wildlife law training for the judiciary and enforcement agencies in Lofa County highlighted interference from senior staff and officials as one of the main challenges in combating wildlife crime. Also, the need to engage traditional leaders, town chiefs and elders to support enforcement agencies and the FDA in their investigations. Wildlife crime in general is not considered as serious as other crimes even by those responsible for enforcing the law; as already mentioned, the majority of participants were unaware that it is covered by the penal code. Massive public awareness, continued training and increased support to the FDA and MOJ to strengthen enforcement are a fundamental part of the activities required to reduce wildlife crime. Animal welfare also needs to be featured more heavily on college and university curriculums as part of animal husbandry and conservation courses.

The lack of arrests in Wonegizi has been a challenge, and the number of persons who are arrested and then "escape" is not acceptable. It is strongly recommended that measures are put in place by the FDA to hold staff properly accountable for their actions. In addition, the establishment of performance indicators are encouraged in future projects. The Wonegizi rangers have received a lot of training throughout this project (and other projects) over the last one and a half years and have benefited from exchange visits and workshops both nationally and internationally. Whilst there are challenges, particularly where the FDA has arrested perpetrators in the past only for the case to be thrown out of court, there have been successful prosecutions for wildlife crime recently and regular public burnings of bushmeat conducted by the FDA. The FDA is in the process of arming its rangers, but the FDA were arresting people previously without arms, and most rangers are used to judging a situation and only arresting if it is safe to do so; therefore, the lack of arrests in Wonegizi suggests a failure and/or general reluctance to enforce the law. Community auxiliaries do not have the authority to arrest and can only assist as directed by the FDA.

Differences in government structure were slightly challenging when it came to developing the ZWW transboundary documents (e.g., the bilateral framework agreement and operational MoU), specifically with regard to the appropriate signatories for each country. The FDA has the mandate of ensuring the sustainable management and conservation of Liberia's forest and related natural resources for the benefit of current and future generations. Whereas in Guinea, although MEEF has the same responsibility, the administration and management of the forests in each region is under the remit of "a public establishment of administrative and scientific character," which in the case of the Ziama MAB and classified forests in the same region, comes under the CFZ.

Sufficient consideration needs to be given to the respective languages spoken by each country in a bilingual transboundary project. Standard forms, reporting templates, M&E instructions, donor requirements, training, contract templates etc. should be made available in both English and French. Meetings should provide adequate translation services, and this needs to be factored into the overall budget as such requirements are expensive. The translation of the rapid biological assessments cost a significant amount.

The most significant barriers in Guinea have been the low capacity and severe lack of engagement of the principal partners—CFZ. Even when dealing with communities, many of the issues that have been faced have been due to a lack of trust given the failings of the historical relationship with the reserve authorities. A great deal of progress has been made in putting in place regulations, drawing up a comprehensive management plan and ensuring that there is community participation in the management of Ziama. However, there is little evidence on the ground of the willingness of the CFZ to implement these developments on a consistent basis.

One of the most vital lessons learned in Guinea has been the importance of continual engagement with the communities. The more authoritarian approach of the past resulted in a confrontational relationship between the reserve managers and the communities. To obtain "buy-in" from the communities, it is essential that they feel they have a say in the management of the reserve and that some benefit accrues to them. People do understand the need for regulations and the importance of conserving natural resources, but it is important to explain this to them and keep reminding them of that importance. This is why the communications program, in particular the sporting events, have been so successful.

It is vital to provide farmers with information that enables them to reduce the negative impacts of their activities on the environment without a loss of income. One of the best examples of this was the use of herbicides and pesticides. Farmers, we found to our surprise, were already quite concerned about using these chemicals, but saw no other alternatives. The response to the trainings on the biopesticides was extremely positive and there is every hope that they will continue to employ these methods in the future.

In January 2019, FFI supported the establishment of a soccer team (Les Elephants de Ziama) chosen from amongst the rangers of the Ziama MAB. They have been provided with equipment and undergo regular training. The objective of establishing the team is to promote goodwill between the ranger force and local communities, as well as providing opportunities for promoting the work of the reserve and to transmit messages about conservation and the responsible management of natural resources. So far, six matches have been played. These were highly successful events attended by large numbers of local spectators, and this approach will continue to be used by FFI in future behavior change communication plans. In addition, dissemination of awareness messages village by village in a mobile way using a vehicle and PA system was an effective means of communication in lieu of radio communication.

As always, budgeting and time remains a challenge. The time taken to set up a project from the moment a grant is awarded can be protracted, severely limiting time for implementation. This project is a very good example of the constraints and pressure placed on implementation in the face of such issues. The start of this project was delayed to the point where a 3-year project had to be

implemented within 18 months. The launch of the project in Guinea was delayed until October 2018 due to government protocols.

Onerous donor requirements can have significant impacts on timely implementation (e.g., Leahy vetting, approval requirements for flights, staff etc.). For example, a planned training on the wildlife law did not go ahead in 2019, as Leahy vetting took six months due to issues with the form.

In addition, considerable time was spent assessing and realigning budgets, particularly in the last half of 2019, compounded by continued pressures to extend the duration of the project or risk the grant being cut because we were not spending quickly enough. Indeed, the budget was cut in the final quarter because the donor did not agree a certain activity (implementation of a communications strategy) would add any value at that point in the project, which resulted in FFI not meeting our deliverables and backing out of commitments with a long-term partner. Whilst the situation was resolved, we believe there would still have been time to implement the activity, which would have been invaluable in creating awareness during this period of the COVID-19 pandemic.

6.0 POTENTIAL IMPACTS & SUSTAINABILITY

FFI is working closely with the FDA and other stakeholders to achieve gazettement of Wonegizi as a multiple-use reserve. There have been a series of planning meetings with the FDA, LLA and other partners, as well as a landmark meeting with the FDA and LLA to address the potential differences in interpretation to ensure the gazettement of Wonegizi adheres to the law, FPIC and follows best practice. As previously mentioned, the gazettement process is being documented and will be developed into a protocol in partnership with the FDA, so as to guide the gazettement of other PPAs in future.

Thanks to USAID and NORAD funding, Wonegizi has become an operational PPA, as regular management activities such as law enforcement patrols and biomonitoring have been established. Capacity building and provision of fundamental tools and equipment, such as motorbikes, monitoring tools (e.g., GPS and cameras) and camping equipment have helped to ensure rangers can carry out their duties. Transboundary management initiatives formalized under the bilateral framework agreement and operational MoU will encourage sustained collaboration between the FDA and CFZ in managing the landscape together. Joint patrols and awareness were planned to start in early 2020, however activities have been postponed due to COVID-19. Such a collaboration can help to source additional funding from donors. In addition, FDA staff on the ground may be encouraged to follow the example of their Guinean partners and strengthen law enforcement in Wonegizi. Cementing partnerships with Taï National Park and GRNP through continued exchanges also have the potential to strengthen PA management and law enforcement at a regional level, through knowledge exchange, capacity-building activities and intelligence sharing. It is strongly recommended that such initiatives continue to be supported.

FFI and other stakeholders successfully lobbied for Wologizi to remain part of the PA network in 2017. We are continuing to collect data in order to scientifically prove Wologizi's importance for biodiversity and provide the evidence required for it to be gazetted as a PA in the future. The results of surveys so far were used to make a formal public request to the FDA for law enforcement staff to be posted at Wologizi. The next step will be to develop a gazettement package for Wologizi.

Following the formal adoption of the updated Ziama management plan, an important step now is to draw up ToRs for all the different positions in the ranger force from the director down. This will enable the CFZ to further identify gaps in capacity and understand what the priorities are for training. The development of the updated Ziama management plan has provided the guidelines for Ziama operations and FFI is currently securing funding to support the CFZ to implement the management plan.

Effective lobbying of senior government officials started with the knowledge learning exchange to Namibia at the end of September 2019. There is no doubt the experience has had a positive impact as representatives voice their newfound support for the REDD+ pilot project in Wonegizi, ecotourism and conservation in general. The Lofa County superintendent Hon. William Tamba Kamba and District 4 representative Hon. Mariamu Fofana requested as much information as possible about FFI's work in the two landscapes (ZWW and TGKS) and are now regularly involved and updated with FFI's activities. Both expressed a desire to understand more about REDD+ and the benefits of conservation so they can advocate for sustainable development for the people and the country. Both the Liberian and Namibian delegates are keen to strengthen the relationship between the two countries further, and both parties are already discussing and/or planning to discuss next steps with the respective ministers. At a recent meeting with Namibian parliamentarians during the high-level study tour, officials reflected on Liberia and Namibia's shared history together, as Liberia supported Namibia's struggle for independence and Namibia troops were part of the United Nations Mission in Liberia. Such a partnership has real potential to benefit both countries. Following the

Namibia trip, Hon. Fofana and Hon. Tamba Kamba attended the 25th Conference of the Parties in Madrid, funded by NORAD.

As part of the activities of the LESC, FFI contracted law firm HPA to develop wildlife regulations for the National Wildlife Conservation and Protected Area Management Law of 2016. The draft regulations are currently under review by the LESC and are being harmonized with the revised wildlife law to ensure consistency. The regulations will significantly strengthen the law and serve as a more effective deterrent for wildlife crime. FFI will continue to support Liberia and Guinea in the fight to combat wildlife crime and is already making significant headway under the UKAid IWT grant with the development of the national strategy, which provides a framework for IWT activities in Liberia in line with the regional strategy.

Dr. Mary Molokwu-Odozi's (country manager, FFI Liberia) idea for the SWG has become a firm reality since its inception, and the model is attracting a lot of interest from donors and partners. Participants at the Pygmy Hippo Regional Action Planning Workshop agreed a regional SWG should be established, and WA BiCC was very keen for the model to be introduced to Guinea, however this was outside the scope of the current project and should most definitely be considered as an initiative under future funding.

The work with farmers needs to continue to lessen the negative impact of their activities on the reserves. Helping farmers adopt and maintain improved agricultural methods and develop markets for their produce is at the core of that. To ensure dissemination of lessons learned and best practices with regard to the agricultural interventions, FFI will organize open days at the FFS sites to bring together other farmers from the area with the aim of facilitating discussions between different actors on the best practices developed during the campaign. New participatory learning schools will be established in other riverside villages and beneficiaries monitored in the implementation of the innovations introduced under this project. Furthermore, to preserve the achievements of the project and ensure sustainability, we suggest not only continuing the agricultural activities undertaken during this project, but also broadening this support to other communities in the area.

For Ziama in particular, it is essential to set up the network of community conservation committees that will be the conduit of information and decision making between the villages and the reserve authorities. It is also important to share successful interventions between projects and organizations, not just in Guinea, but across the whole region.

Next steps for the PMSD activities under future funding include preparing the Wonegizi communities for a multi-stakeholder workshop where the cocoa producers will meet buyers (traders, exporters and corporates in the sector may be for the first time) to directly discuss the issues they have in common. This preparation requires meetings at the community level to select a representative who can speak on behalf of the community and behave confidently in a multi-stakeholder setting. The selected person/s will be provided training on market literacy, and support provided to draft a problem statement, their vision and what they offer to other market actors. Follow-up meetings with corporates in the cocoa sector to help them see the business interest in engaging directly with cocoa producers will also be arranged.

In Guinea, FFI supports with Darwin funds a youth theater group, the Club d'Ecoute. The work with this youth group has continued and the FFI team worked with the group to develop a message about the negative impacts of the use of herbicides and pesticides. This was performed in six villages this year in association with the program of football matches that has been implemented. Equipment was purchased for the Club d'Ecoute in order to begin activities in local communities promoting the conservation of Ziama through theater and music.

In Liberia, students from LCCC have participated in biomonitoring and camera trap training. FFI also mobilized the students to celebrate the IDBD by sending a PPT presentation, 100 t-shirts and 150 fliers. The students were engaged again by George Allison (FFI biodiversity officer, ZWW) on World Chimpanzee Day when he gave a presentation about chimpanzees and distributed 100 t-shirts. Future behavior change communications strategies will focus more on youth as they are the next

generation of leaders and more often than not, they have the energy, interest and passion to effect change.

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ANNEX A: MEP INDICATOR TABLE AND RESULTS

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
8	**Number of people trained on sustainable landscapes supported by USG Assistance**	**474**	**174**	**275**	**25**	**22**	**397**	**110**	**529**	**12.6%**	**144.4%**	**440%**	**111.6%**	FY 2018
	Men					18	320	103	**441**					Ecological sampling: 22 (18M, 4F)
	Women					4	77	7	**88**					
									0					FY 2019
	Local					22	185	72	**279**					Law enforcement: 37 (36M, 1F)
	National						156	3	**159**					Large mammal rapid survey: 5 (4M, 1F)
	Regional						14	0	**14**					Structure and assessment of faunal diversity, Guinea: 2 (2M, 0F)
									0					PH training, Guinea: 11 (11 M)
	Populations (and Community Leaders)						89		**89**					Biomonitoring & PH training: 31 (26M, 5F)

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
	Education and Research						32		**32**					Herpetile survey methods: 4 (4M, 0F)
	Civil Society and Partners						202	7	**209**					Herpetile health and safety: 5 (5M, 0F)—same 4 persons as in the methodology training plus the consultant were trained in H&S
	Press and Journalists								**0**					Plant survey methods: 3 (3M, 0F)
	Public Sector					22	67	103	**192**					Plant health and safety: 5 (5M, 0F)
	Private sector								**0**					Small mammal survey methods: 3 (6M, 0F)
														Small mammal health and safety: 7 (6M, 1F)
														Camera trap training, Guinea: 4 (4M, 0F)
														Camera trap training, Liberia: 29 (24M, 5F)
														Statistical analysis: 6 (3M, 3F)
														ArcGIS: 10 (6M, 4F)
														Ground-truthing: 16 (16M, 0F)
														Communications training, Guinea: 18 (18M, 0F)

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														Biopesticide training, Kpoda, Guinea: 37 (23M, 14F)
														Biopesticide training, Dopamai, Guinea: 41 (31M, 10F)
														Biopesticide training, Sedemai, Guinea: 40 (21M, 19F)
														Participatory market system development (PMSD), Liberia: 15 (13M, 2F); Guinea: 24 (21M, 3F)
														FY 2020
														Camera trap and environmental DNA (eDNA): 10 (10M)
														Spatial monitoring and reporting tool (SMART), Wonegizi: 20 (19M, 1F)
														SMART, Ziama: 15 (15M)
														Wildlife law: 63 (57M, 6F)
														Computer training: 2 (2M)

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
9	**Number of institutions with improved capacity to address sustainable landscape issues supported by USG assistance**	**8**	**1**	**4**	**3**	**0**	**4**	**9**	**13**	**0%**	**100%**	**300%**	**163%**	2019—Forestry Development Authority (FDA), Wonegizi, and the Centre Forestière de N'Zerekore (CFZ), Ziama, have benefited from training in biomonitoring/ecological field techniques and law enforcement patrols facilitated in Wonegizi and Ziama. The FDA and CFZ have participated in learning/knowledge exchange trips to learn about reducing emission from deforestation and forest degradation (REDD) and protected area (PA) management. The skills and agricultural development services (SADS) and Institute de Recherche Agronomique de Guinee (IRAG) are participating in the farmer exchange visits. IRAG benefited from communications and biopesticide training. FDA/CFZ ranger learning exchange: 19 (19M, 0F). Menaldi Lormie, FDA biologist seconded to Fauna & Flora International (FFI), and participation in the Capacity Building

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														Conference for Conservation, Global Conference (CBCGC).
	National Governmental						**2**	**7**	**9**					The FDA, legislature, Ministry of Internal Affairs (county superintendent) and Liberia Land Authority benefited from the high-level study tour to Namibia: 2M, 2F, funded under ZWW in 2020.
	Sub-national Governmental								**0**					IRAG and SADS staff continued to participate in farmer exchange visits in 2020.
	Other						**2**	**2**	**4**					Liberia National Police (LNP), BIN, Judiciary, FDA, LDEA participated in the Wildlife law training in 2020.
10	**Number of laws, policies, regulations,**	**6**	**1**	**4**	**1**	**0**	**5**	**5**	**10**	**0%**	**125%**	**500%**	**166.7%**	2019—Free Prior and Informed Consent (FPIC); 2) Community,

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
	or standards addressing sustainable landscapes formally proposed, adopted or implemented as a result of USG assistance													Carbon and Biodiversity (CCB) Standards; 3) Wildlife law 2016; 4) National Forestry Reform Law 2006 and 5) Land Rights Act (LRA) 2018 implemented in the gazettement process for Wonegizi.
	Local								**0**					National biomonitoring standard operating procedures (SOP) is a work in progress under the biomonitoring sub-committee. National law enforcement SOP is a work in progress under the law enforcement sub-committee (LESC). The revision of the wildlife law 2016 is also in progress under the LESC.
	National								**0**					
	Regional								**0**					
									0					2020—1) Bilateral framework agreement; 2) Operational memorandum of understanding (MoU); 3) National Strategy to Combat Illegal Wildlife Trade (IWT); 4) Revised Wildlife Law Regulations (draft) and 5) Revised Ziama management plan.

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
12	**Number of people receiving livelihood co-benefits (monetary or non-monetary) associated with the implementation of USG supported sustainable landscapes activities**	**50**	**5**	**30**	**15**	**0**	**75**	**75**	**150**	**0%**	**250%**	**500%**	**150%**	Farmer Field Schools (FFS)—75 direct beneficiaries (25 persons in 3 communities); and 800 indirect beneficiaries. When a direct beneficiary receives interest from his/her production, he/she shares with his/her family. So it allows people who depend on him/her to benefit sharing of seeds, food and others.
	Men						47	47	**94**					Kpoda: 117 M, 141F = 258
	Women						28	28	**56**					Sedemai: 171M, 162F = 333
														Dopamai: 86M, 123F = 209
														Total: 374M, 426F
14	**Number of hectares of biological significance and/or natural resources under improved natural resource**	**156,998**	**156,998**	**156,998**	**156,998**	**156,998**	**156,998**	**156,998**	**156,998**	**100%**	**100%**	**100%**	**100%**	Regular biomonitoring and law enforcement patrols in Ziama April 2018. Regular law enforcement and biomonitoring in Woneigizi. The gazettement process for Wonegizi has been developed that acknowledges the

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
	management as a result of USG assistance													inconsistency in the LRA. Documents produced include law enforcement protocol, biomonitoring protocol, camera trapping protocol, landscape level planning methodology, ground-truthing methodology, draft gazettement package for Wonegizi, community consultation protocol, rapid assessment program (RAP) reports (to date: large mammals, birds, butterflies, plants and herpetiles), HCV methodology and bird/cocoa/farm report. Previously reported as 145,038, based on figures: 116,170 for Ziama from the online United Nations Education, Scientific and Cultural Organization (UNESCO) Man and Biosphere (MAB) Reserves Directory, and 28,868 for Wonegizi came from a 2015 Critical Ecosystem Partnership Fund (CEPF) technical report "Ecosystem Profile: Guinean Forests of West Africa Biodiversity

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														Hotspot" by Carr, Adeleke et al. Updated figures as per Direction Nationale des Eaux et Forêts: 119,019 for Ziama (http://www.eaux-forets.gouv.gn/index.php/foret_guineenne/forets-classes/forets-classees-de-l-etat/106-forets-classees) and the Ziama management plan, which states "La Réserve de Biosphère du Ziama est située au Sud-Est de la Guinée, à 1000 km de Conakry. Le massif forestier de ZIAMA est situé dans la préfecture de MACENTA. Elle couvre une superficie de 119,019 ha entre 8°03' et 8°32' de latitude Nord et entre 9°08' et 9°32' de longitude ouest. Wonegizi—37,979 ha as per FDA (http://www.fda.gov.lr/wp-content/uploads/bsk-pdf-manager/NATIONAL__FORESTS_CLASSIFICATION_AND_USES__MATRIX_15.pdf)."
	Coastal-marine								**0**					

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
	Terrestrial-freshwater								**0**					
	Wildlife trafficking					**156,998**	**156,998**	**156,998**	**470,994**					2020—1) Progress with Wonegizi gazettement; 2) Landscape level assessment (LLA) completed and recommendations made to FDA; 3) ZWW bilateral framework agreement and memorandum of understanding (MoU) signed, first transboundary MoU meeting and steering committee ToRs finalized; 4) Patrols and biomonitoring ongoing in Ziama and Wonegizi; 5) Ziama MP validated and formally adopted; 6) Community meetings to explain the Ziama MP (Oremai and Sengbedou grouped together on February 27, 2020 in Kassanka.); and 7) Meeting with officers and officers of judicial police to ensure efficient use of laws against poaching.
	Illegal logging and associated trade					**156,998**	**156,998**	**156,998**	**470,994**					

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
	Illegal, unreported and unregulated fishing								**0**					
18	**Number of people that apply improved conservation law enforcement practices, as a result of USG assistance**	**172**	**6**	**86**	**80**	**0**	**86**	**149**	**235**	**0%**	**100%**	**186%**	**136.6%**	2019—12 Law enforcement rangers in Wonegizi and 74 rangers in Ziama are fully trained on collecting threats data in Wonegizi and Ziama. They are also collaborating (Wonegizi rangers have made an exchange visit to Ziama).
	Men						85	142	**227**					2020—Patrols ongoing. An end-of-year review was held with FDA rangers and community auxiliaries to review progress and identify areas for improvement. A transboundary operational MoU has been signed and an operational meeting held to plan joint transboundary activities (e.g., patrols, awareness etc.). The first joint patrol in March has been postponed due to COVD-19.

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
	Women						1	7	**1**					Wildlife law training for judiciary and enforcement agencies in March has built capacity of the judiciary and enforcement agencies in enforcing the wildlife law (total = 63: 57M, 6F). This includes checkpoint staff, magistrates, the county attorney, FDA rangers, police, immigration and LDEA officers.
									0					
21	**Number of tools, databases, monitoring systems developed or adapted to analyze, organize, manage or share data on climate change and biodiversity**	**7**	**5**	**1**	**1**	**1**	**7**	**1**	**9**	**20%**	**700%**	**100%**	**129%**	1) High conservation value (HCV) bird/cocoa/farm methodology and datasheet.
	Local					1	3		**4**					2019—2) Law enforcement protocol—methodology and datasheet developed; 3) General biomonitoring protocol for the

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														Wonegizi proposed protected area (PPA)—methodology and datasheet developed; 4) LLA methodology developed; 5) Camera trapping protocol—methodology and datasheet developed for Wologizi; 6) Ground-truthing SOP developed for ZWW—methodology and datasheet; 7) National PH survey—methodology and datasheet developed; 8) Community consultation protocol for gazettement.
	National						1	1	**2**					2020—9) Gazettement protocol under development. Process being documented as it progresses.
	Regional						1		**1**					

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
22	**Number of best practices and approaches identified, implemented, and/or adopted as a result of USG assistance**	**8**	**1**	**6**	**1**	**0**	**7**	**1**	**8**	**0%**	**117%**	**100%**	**100%**	2019—1) SADS trained in conservation agriculture (CA) and FFSs (FFS curriculum) by the Norwegian Agency for Development Cooperation (NORAD) (but not mentioned in monthly reports); 2) Development of ZWW transboundary management strategy; 3) Along with partners (FDA and SADS and national consultant John Woods), we developed a protocol for community consultation following the wildlife law and FPIC guidelines during the planning meetings for gazettement of Wonegizi; 4) Law enforcement protocol; 5) Biomonitoring protocol; 6) The national pygmy hippo data collection protocol were also developed along with partners, and fecal sample collection protocol; 7) LLA methodology; 8) Camera trapping protocol. 2020—Law enforcement (SMART) protocol

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
23	**Number of networks recognized at a regional and national level and addressing climate change (mitigation or adaptation) and/or biodiversity conservation officially installed or strengthened as a result of USG assistance**	**6**	**3**	**2**	**1**	**3**	**3**	**0**	**6**	**100%**	**150%**	**0%**	**100%**	FFI officially hosts the species working group (SWG) and participates in related sub-committees (law enforcement, biomonitoring, plant and animal) and has supported 4 SWG quarterly meetings in this reporting period. FFI has attended 6 LESC, biomonitoring sub-committee (2 meetings Y2, but set up in Y1), plant and animal sub-committee (1 meeting Y2) have also had meetings. FFI continued to strengthen these networks this year. In October 2018, the official ZWW steering committee was also launched. The plant and animal sub-committee, a new sub-committee, was formed in 2019. ZWW transboundary document validation meeting Feb 2019. ZWW bilateral framework agreement operational MoU signed in October 2019. In August 2019 supported development of the
	Local								**0**					
	National						3	1	**3**					
	Regional							1	**0**					
									0					

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														Wildlife Crime Task Force (WCTF) protocol.
24	**Number of audio-visual programs produced and broadcast on climate change adaptation, sustainable landscapes and/or biodiversity conservation with the support of the project**	**76**	**1**	**55**	**20**	**0**	**6**	**23**	**29**	**0%**	**10.9%**	**115%**	**38.2%**	2019—1 radio program broadcast for the International Day of Forests (IDF) (a 1-hour program on 1 radio station on the morning of the day). International Day of Biological Diversity (IDBD) (3 shows), radio appearance on the first arrest and fine for illegal possession of a Chimpanzee (1 x 30 minute show—not reported in 2019 annual report), World Chimpanzee Day (1 show). 2020—Agricultural campaign: 5 audio messages in 3 different languages played in 23 communities in Guinea.

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
25	**Number of people participating in community mobilization campaigns conducted as a result of USG assistance**	**9300**	**100**	**5200**	**4000**	**100**	**4905**	**14012**	**19,017**	**100%**	**62.8%**	**328%**	**177.3%**	FY 2018—World Chimpanzee Day: 100. FY 2019—Guinea launch: 74; International Day of Forests: 200; Bilateral meeting (Ziama): 56; IDBD: 400 total (100 in Monrovia, 200 at University of Liberia (UL), 100 at Lofa County Community College [LCCC]). World Chimpanzee Day: 286 total – Monrovia (over 200 as 200 t-shirts distributed and they were not enough), LCCC (86); Ziama football matches: 3850 – February, Sérédou – 900; March, N'Zebela –500; May, Kpoda – 800; June, Dopamai – 350; July, Boo – 500; August World Elephant Day: 700; Farmer Exchange visits: visit 1 Sep 2019 to Guinea: 5 Liberians and 34 Guineans. The outreach campaigns did not take into consideration disaggregation by gender as most people were not captured in attendance sheets. So if we record the men/women, records

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														may not add up to the total (430).
														2020—1) 100 protected species posters and 100 protected species/wildlife law fliers distributed at World Wildlife Day; 2) NGO presentation day (LLA and RAP results)—35 people (26M, 9F); 3) Ziama RAP results presentation—20 persons (20M); 4) Community meetings to explain the Ziama MP TOTAL = 144: Fassankoni total—30 (23M, 7F), Kassanka total—39 (34M, 5F), N'Zebela total—30 (27M, 3F), Sérédou total—45 (42M, 3F). (Oremai and Sengbedou

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														grouped together on February 27, 2020 in Kassanka.); 5) Agricultural message broadcasts—23 villages, 6145 people attended and more than 150 women per village were present; 6) Awareness on the Wildlife Code and Forest Code in 32 communities total 1036 (774M, 262F); 7) Protected species billboard installed April 3, 2020 at Capitol Hill in Monrovia (population is 36,590 [2010 Census]; 38,529 [2019 estimate]) (www.cityofmonrovia.org). Population in Sinkor was recorded at 43,780 in the 2008 census; 309,667 motor vehicles recorded in Greater Monrovia in 2019. A report estimates the total number of trips that start in Sinkor (the area before Capitol Hill) per year are 83,590, 105,962, 119,237 for 2008, 2014 and 2019 respectively. Total trips that arrive in Sinkor per year are estimated at 88,213, 104,831, 117,448 for 2008, 2014 and 2019

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														respectively. The total number of trips that start in Monrovia area A (where Capitol Hill is situated) per year are 182,576, 214,928, 238,515 for 2008, 2014 and 2019 respectively. Total trips that arrive in Monrovia area A per year are estimated at 199,290, 230,588, 253,092 for 2008, 2014 and 2019 respectively. SOURCE: The Master Plan Study on Urban Facilities Restoration and Improvement in Monrovia in the Republic of Liberia, Chapter 4 Urban Facilities Restoration and Improvement Plan (http://www.openjicareport.jica.go.jp/pdf/11965860_05.pdf).
	Local			300		100	3,266	12,976	**16,342**					BILLBOARD CALCULATION: Based on the above figures and if we take the lowest number of trips estimated to arrive in Monrovia area A from 2008, which is 199,290/365 days per year = 548 trips per day. April 4–15 = 12 days x
	National								**0**					
	Regional								**0**					

NO.	PERFORM-ANCE INDICATOR	TARGETS				ACTUAL RESULTS				PERCENTAGE PERFORMANCE				COMMENTS
		LIFE OF THE PROJECT	FY 2018	FY 2019	FY 2020	FY 2018	FY 2019	FY 2020	TOTAL	FY 2018	FY 2019	FY 2020	TOTAL	
														548 = 6576 persons have potentially passed by the billboard.

ENVIRONMENTAL INDICATORS REPORTING *(Based on the EMMP Indicators)*

SN	Environmental Mitigation and Monitoring Indicator	Targets	Results	Required Supporting Documents	Comments
1	Protocol developed	1	2	General Ethical Field Consideration Protocol for Biomonitoring Health, Safety and Environment Protocol	An initial general ethical protocol was developed for biomonitoring. Later, a more detailed health and safety protocol was developed for the rapid assessment program (RAP)
2	Number of people trained on ethical behavior during the survey	38	70	Participant list, training report, agenda	Training was carried out before fieldwork for RAP and biomonitoring activities Ecological sampling: 22 (18M, 4F) Biomonitoring and PH training: 31 (26M, 5F) Herpetile health and safety 5 (5M, 0F) Plant health and safety: 5 (5M, 0F) Small mammal health and safety: 7 (6M, 1F)
3	Number of rangers/community auxiliary trained on ethical behavior during the law enforcement	23	37	Participant list, training report, agenda	Law enforcement: 37 (36M, 1F)
4	Number of people trained on use of biopesticides	50	118	Participant list, training report, agenda	Biopesticide training, Kpoda, Guinea: 37 (23M, 14F) Biopesticide training, Dopamai, Guinea: 41 (31M, 10F) Biopesticide training, Sedemai, Guinea: 40 (21M, 19F)
5	Number of people trained on compost and mulching	50	75	Participant list, training report, agenda	Farmer Field Schools (FFS)—75 direct beneficiaries (25 persons in 3 communities)
6	Number of people trained on selection of sites	50	75	Participant list, training report, agenda	FFS—75 direct beneficiaries (25 persons in 3 communities).

SN	Environmental Mitigation and Monitoring Indicator	Targets	Results	Required Supporting Documents	Comments
7	Number of people trained on conservation agriculture (CA)	50	75	Participant list, training report, agenda	FFS—75 direct beneficiaries (25 persons in 3 communities).
8	Number of people trained on CA	50	75	Participant list, training report, agenda	FFS—75 direct beneficiaries (25 persons in 3 communities).

ANNEX B: POSTER PRESENTATION BY M. LORMIE

Building Conservation Capacity as a Key to Saving Liberia's Rich Biodiversity - My Story

Menladi M. Lormie[1,2], Wing Y. Crawley[1] & Mary Molokwu-Odozi[1]
[1] Fauna & Flora International, #2 Johnson Compound, Congo Town, Monrovia Liberia
[2] Forestry Development Authority, Whein Town, Mount Barclay, PO Box 10-3010, Monrovia Liberia

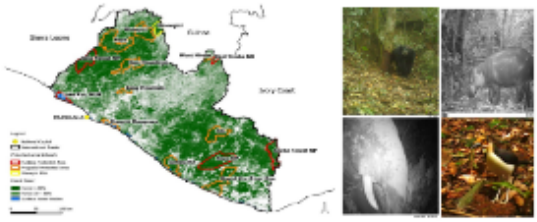
Introduction

What is the problem?

- Liberia's rainforest is exceptionally diverse with many endemic and threatened species, yet it faces serious threats from deforestation and forest degradation.
- The country faces human resource/capacity gap to conserve its rich forest estate
- Few staff exist in Protected Areas (PAs) and they lack the requisite skills to ensure increased efficiency and effectiveness in the protection of the PAs.
- Staff with requisite technical expertise at the FDA Conservation Department is about **15** out of **162** and most of the PAs in Liberia are managed by level D Rangers

Why is this a problem?

- Limited technical know-how has resulted in conflict with communities, biodiversity knowledge gaps, weak law enforcement etc. as the capacity to adequately address threats such as HWC, IWT, illegal mining, unsustainable harvest etc. is largely lacking.



Map of Liberia showing forests and protected areas

Approach

- Government engaged International and National Non-Governmental Organizations (NGOs) to provide relevant trainings to PA staff and academic institutions in practical field experience, internships, scholarships and mentorships
- As opportunities were rolled out for PAs staff, I took keen interest in both long and short time trainings as my country Liberia universities do not offer a wide range of skills in conservation biodiversity.
- I also took advantage of basic statistics for academic writing, leadership and management skills, conservation policy and strategic planning, biomonitoring and ecological sampling.

Result

Conservation status of chimpanzees *Pan troglodytes verus* and other large mammals in Liberia: a nationwide survey

- These initiatives by FFI and other conservation NGOs and research institutions have promoted my career in conservation & research
- Today, I have co-authored four scientific articles, which is a rare feat among rangers
- The results of my strengthened capacity and achievements has led to my nomination for an Africa Ranger Award
- I am the only FDA staff seconded on the USAID-WABiCC project implemented by FFI and other partners

Conclusion & Recommendation

- The need to build capacity of many young scientists in Liberia has become necessary in an effort to develop and increase professional and technical expertise in conservation for long-term sustainability
- I am one of the few park rangers who have benefited from the many trainings offer by FDA's conservation partners
- FFI and other conservation partners approach in mentoring and building capacities have proven significant as there are many young people being trained as interns in conservation organization across Liberia
- The impact of successful capacity multiplies as the one acquiring the knowledge is able to train others
- These training and mentoring initiatives have empowered me to train other colleagues & upcoming conservationists, causing a ripple effect

Acknowledgement

USAID | CRITICAL ECOSYSTEM PARTNERSHIP FUND | FAUNA & FLORA INTERNATIONAL

ANNEX C: INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY ARTICLE

Our Biodiversity, Our Future

By Wing Crawley (FFI), Jenny Desmond (LCRP) and Shadrach Kerwillain (FFI)

Mama Liberia is blessed with the largest remaining portion (42%) of the Upper Guinean rainforest; a forest that runs through Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana and Togo. Our forests are exceptionally diverse with thousands of plant and animal species, many found nowhere else in the world. However, her biodiversity is greatly suffering, especially from hunting for the bushmeat trade.

After habitat loss, the most immediate threat to many threatened species is large-scale poaching. The IWT in Africa has an estimated value of $7–$10 billion per year, making it an extremely lucrative business, second only to narcotics, human trafficking, oil and counterfeiting (EAGLE, 2019). Indeed, these illicit businesses often go hand in hand. The African elephant, great apes and other species are not only at risk as we destroy their homes by clearing forests for development, logging and agriculture, but illegal hunting (poaching) and organized trafficking are reducing wildlife populations at an unprecedented rate. At current levels of exploitation, our children and grandchildren will not be able to see many of the wonderful animals that are a key part of our culture and tradition.

Liberia Chimpanzee Rescue and Protection (LCRP) was established in 2016 to care for orphan chimpanzees who were being kept or sold illegally and so were confiscated by wildlife authorities. Some have experienced unimaginable cruelty, like Johnny who was chained to a tree by his neck for 10 years. Currently there are 42 chimpanzees in LCRP's care, all but two are under the age of 5 or 6 years, 8 were received by LCRP in the first quarter of this year. Many more chimpanzees have been reported and are yet to be confiscated. To get a baby chimpanzee away from his/her mother, the mother and other family members have to be killed. An estimated 10 adult chimpanzees will be killed at any one time. When you see one baby chimpanzee in the street, he/she represents 10 chimpanzees killed in the wild. The 42 orphans at LCRP indicate over 400 of the only 7000 chimpanzees left in Liberia are now gone forever, victims of the bushmeat and pet trades in just a few short years! Imagine that—is it worth it?

The Western chimpanzee is protected by law in Liberia and is classified as critically endangered on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species. This means the species is at an extremely high risk of extinction in the wild. Based on confiscation figures in the first quarter of 2019, and assuming that figure is low (accounting for undetected chimpanzees killed or being sold), Liberia is on track to lose an estimated 600 adult chimpanzees every year, leaving our population at a very real risk of being wiped out in the next 10 years. Unless we start respecting the law, and stop hunting chimpanzees for bushmeat and selling their babies for pets, our unborn children will only see them in books or in films.

The forest elephant and all species of pangolins are also protected by the law in Liberia, yet six elephants (that we know of) have been killed in Liberia already since January! Pangolins—the most highly trafficked mammal in the world—are subject to widespread hunting for bushmeat and traditional, but unproven, medicines. Liberia has three species of pangolin, all listed as threatened, and we continue to see them every day being sold as bushmeat in our capital city.

Liberian wildlife, dead and alive, is also sold over our borders to places like Sierra Leone and Côte d'Ivoire and, even internationally, to countries like China and the Middle East. Ivory is sold for decoration, chimpanzees for entertainment, shells and body parts for jewelry. One of the products highest in demand is pangolin scales for health purposes, even though there is no scientific evidence

showing they are in any way effective as a treatment. How much longer will these species survive in Liberia?

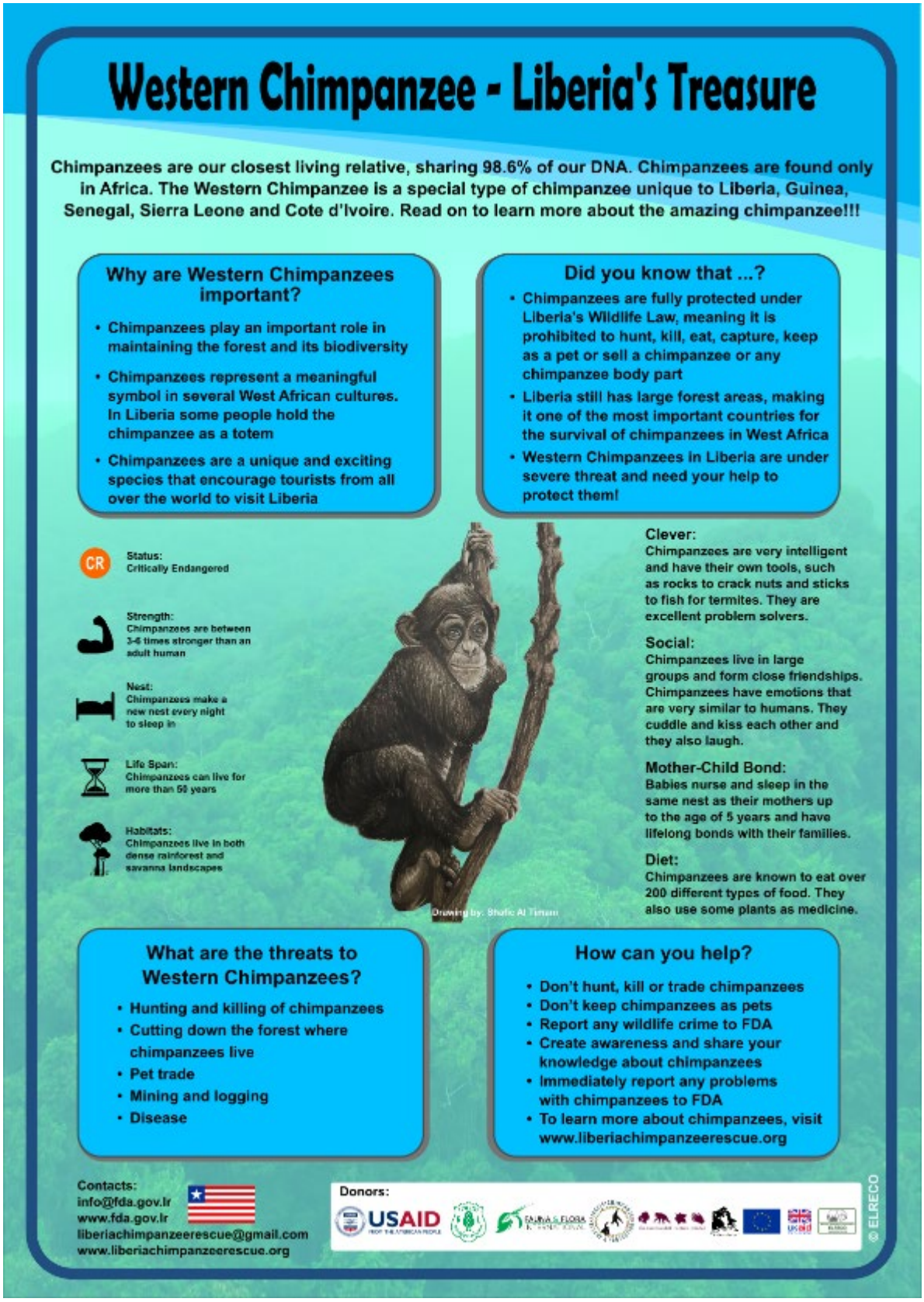
Death is a part of life. It comes to us all. But extinction—that is something else. Extinction means all the individuals of a species have died and we will not see that species ever again. Never ever!

It has been written that "extinction is the death of birth." Is that what we really want to pass on to our future generations?

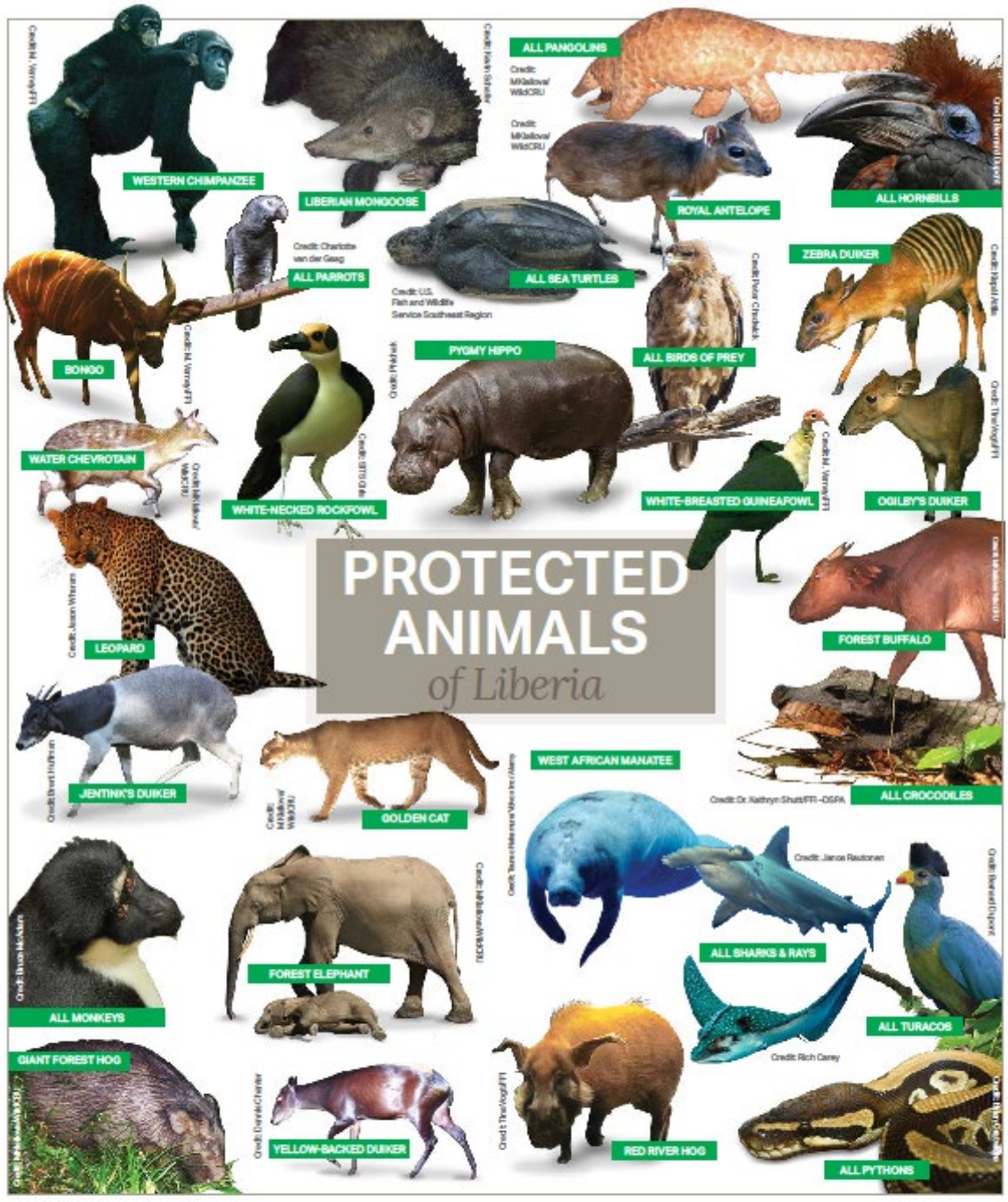
Please take a moment to think about that, before you decide to buy that sweet bushmeat or that chimpanzee as a pet for your children to play with.

To report an orphan chimp or other illegal wildlife crime, contact the Forestry Development Authority Wildlife Division.

ANNEX D: WESTERN CHIMPANZEE POSTER



ANNEX E: PROTECTED SPECIES POSTER



HUNTING OF PROTECTED ANIMALS IN LIBERIA, BOTH INSIDE AND OUTSIDE OF PROTECTED AREAS, IS PUNISHABLE BY LAW

Anyone caught hunting, buying, selling, capturing, keeping a pet or eating a protected animal will be prosecuted