

FOREMOST DEVELOPMENT SERVICES LIMITED

(Development & Sustainability Consultants)



ASSESSMENT OF HIGH CONSERVATION VALUES IN OKOMU OIL PALM COMPANY MAIN ESTATE, OKOMU-UDO, OVIA SOUTH WEST, EDO STATE, NIGERIA

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- *Location of Assessment: Edo State, Nigeria*
- *Size of Assessment Area: 15,580 ha*
- *Current Use of the Assessment Area: Oil palm and Rubber Plantation*

ABOUT FOREMOST DEVELOPMENT SERVICES

Foremost Development Services (FDS) Limited is a wholly indigenous firm of development consultants with tremendous expertise and diverse experience spanning well over 20 years in the identification, formulation, planning, execution and management of development projects at local, national and international levels.

FDS' mission is to render all forms of Technical, Economic and Management Services relating to Agriculture, Forestry, Rural Development, Natural Resources Conservation, Agro-Industry and the Environment that will ensure the Financial/Economic prosperity of our client and always in harmony with the environment.

FDS grew out of the Agricultural Services Department of Knight Frank and Rutley (KFR), the famous Property Development and Estate Agency partnership based in Lagos.

The Agricultural Services Department of KFR was established during the 1970s. It was given further impetus when the Nigerian government decree for backward integration came into effect in the early 1980s. It was felt that there were opportunities for large-scale agricultural schemes with the major companies particularly those that needed to tap into local raw materials. Incidentally, such companies as Glaxo, Beechams, Guinness, Nigeria Breweries Plc, Flour Mills of Nigeria, CFAO, and UAC Nigeria Plc were major clients. Also were Federal and State governments as were a number of other not so well known companies and individual firms.

In late 1991, the partnership of KFR divested their interest in the Agricultural Services Department to concentrate on their estate business. With this background, Foremost Agricultural Services (FAS) was incorporated in 1992 to take over fully the functions and Clientele of the Agricultural Services Department of KFR. Since then FAS has continued to provide qualitative consultancy and management services to high profile clients.

Foremost Development Services (FDS) was later established to expand the frontiers of its clients and services. FDS has since continued to render more specialized services in development and sustainability. FDS has the certification and accreditation of Federal and some States' environmental protection agencies to undertake professional services relating to conservation, environmental studies and management. In addition, key staff of FDS have obtained the certificate as RSPO Lead Auditors and also building their capacity to obtain Provisional License for HCV Assessments.

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	Assessor Licensing Scheme
APHA	American Public Health Association
CDA	Community Development Association
CE	Critically Endangered Species
CEO	Chief Executive Officer
CEPF	Critical Ecosystem Partnership Fund
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
ES	Endangered Species
FAO	Food and Agriculture Organisation of the United Nations
FGD	Focused Group Discussion
FR	Forest Reserve
FSC	Forest Steward Council
HCV	High Conservation Value
HCV RN	High Conservation Value Resource Network
GPS	Global Positioning System
IITA	International Institute for Tropical Agriculture
IUCN	International Union for Conservation of Nature
LC	Least Concerned Species
LGA	Local Government Area
MoU	Memorandum of Understanding
M. Phil	Master of Philosophy
NA	Not Assessed Species
NBSAP	National Biodiversity Strategy and Action Plan
NE	Not Evaluated Species
NGO	Non-Governmental Organization
NNPC	Nigerian National Park Services
NP	National Park
NPC	National Population Commission of Nigeria
NT	Near threatened species
NTFP	Non-Timber Forest Product
ONP	Okomu National Park
OOPC	Okomu Oil Palm Company
P & C	Principles and Criteria
RD	Relative Density
RSPO	Roundtable for Sustainable Palm Oil
RTE	Rare, Threatened and Endangered Species
SIA	Social Impact Assessment
SOP	Standard Operating Procedure
UN	United Nations
VU	Vulnerable Species
WCMC	World Conservation Monitoring Centre
WWF	Worldwide Wildlife Fund

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1.0 INTRODUCTION AND BACKGROUND

1.1 Purpose of the HCV Assessment

The origin and concept of High Conservation Value (HCV), as conceived by Forest Stewardship Council (FSC), believe that ‘all forests are valuable but some are more valuable than others’. The HCV approach aims at ensuring the identification as well as management of the identified HCVs, potential threats to HCVs and strategies to ensure their continued existence and/or enhancement.

Upon request by Okomu Oil Palm Company (OOPC) Plc, Foremost Development Services Limited (FDS); a local firm of development and sustainability consultants carried out an HCV Assessment at the Main estate concession of OOPC to improve the environmental and social performance and compliance of the company.

The following are the details of the HCV Assessment commissioned by OOPC, based in Ovia South West Local Government Area of Edo State in southern Nigeria. The purpose of the assessment, carried out within the context of RSPO Certification Scheme, was to undertake a comprehensive and participatory assessment of HCVs within the OOPC’s Main Estate with a view to identifying the presence of HCVs in order to maintain or enhance one or more of the identified six HCVs within the estate. The specific objectives of the assessment were to:

- i. Identify all HCVs and potential HCVs in the different locations and/or land-use types within the estate, whose existence could be negatively impacted by future development or other anthropogenic activities. This was to be done in consultation with relevant stakeholders;
- ii. Identify existing or potential threats to the identified HCVs;
- iii. Provide recommendations for the management, monitoring and protection of the identified HCVs in the assessment area.

The steps, procedures and activities were conducted with due considerations to HCV Resource Network Assessor Licencing Scheme requirements. In addition, this report covers relevant information, important points as well as the adopted methodologies.

About Okomu Oil Palm Company

The Okomu Oil Palm Company was established in 1976 as a Federal Government pilot project aimed at rehabilitating oil palm production in Nigeria. At inception, the pilot project covered a surveyed area of 15,580 hectares out of which 12,500 hectares could be planted with oil palm. It was incorporated on December 3, 1979 as a limited liability company. As part of efforts to shore up its revenue base, the company acquired and installed a 1.5 t/h Fresh Fruit Bunches (FFB) mill in 1985 to begin to process its FFB. Prior to the installation of the mill, the company derived its revenue from the sale of FFB. By December 31, 1989, 5,055 hectares of the estate had been planted. The company also began infrastructural developments on the estate at that period. The facilities included office blocks, workshops/stores, staff quarters, a petrol station, a powerhouse and a primary school for children of the company’s staff members.

In 1990, the Technical Committee on Privatisation and Commercialisation (TCPC) privatized The Okomu Oil Palm Company on behalf of the Federal Government of Nigeria. It has since

grown to become Nigeria's leading oil palm company with total area of 33,000 ha of which 17,245 ha is currently planted with oil palm trees and 7,335 ha with rubber trees. Another 4,000 ha of oil palm trees is to be planted within the next year and 1,500 ha of rubber trees by 2020. Currently, the company operates two 30 t/h oil mills and another two 30 t/h oil mills are planned to be operating by the first quarter of 2020.

The privatisation of the Okomu Oil Palm Company Plc. has been a great success and a huge encouragement for the Nigerian agricultural sector, with profound positive consequences of stable socio-economic growth for the region, where it is implanted. The success of the company was further exemplified by the strong increase of its net income, which allowed doubling of its dividend. This company has consistently posted profits in the last 10 years, a period during which most other agricultural initiatives in the country had either folded up or were performing sub-optimally.

What is most inspiring is not just the growth and profitability of the company but the fact that The Okomu Oil Palm Company Plc is ranked 10th among listed companies with the largest turnovers quoted on the Nigerian Stock Exchange (NSE). It is the only agro-business in the NSE's top 16 companies with the largest turnovers. According to the June /July issue of the Bottomline magazine, Okomu Oil Palm Company Plc. is the 9th company with the highest profits before tax among companies quoted on the NSE, and the only agro-business on the Exchange's top 16.

Today, what is now known as The Okomu Oil Palm Company Plc. has transformed into an economic success, earning presidential commendations and rated as one of the top 10 companies on the Nigerian Stock Exchange in terms of turnover. The excellent quality of oil produced by Okomu has guaranteed a premium selling price on the local market, which absorbs the whole production. Just as its expanding in size, its corporate environment is also expanding. Currently, 3,451 people are directly and indirectly employed by the company (permanent and several independent sub-contractors). All these have added up to place it on top in the burgeoning oil palm business and to position it as an emerging leader in rubber production.

Okomu benefits from the quality management provided by its main shareholders and technical partner (Socfinaf). With a 66.12% share in Okomu Oil Palm Plc, Socfinaf is the biggest single shareholder in the company. Socfinaf brings into Okomu Oil Palm Plc a little under a century of sound acclaimed technical expertise in the world stage. Socfinaf (Luxemburg), is a global player in the cultivation of oil palm and, rubber tree plantations. Socfin S.A. founded in 1912 was the first industrial company to plant oil palm in Africa and Indonesia. It has ongoing plantation operations in Sierra Leone, Liberia, Cote d'Ivoire, Ghana, Nigeria, Cameroon, DR Congo, Sao Tome and Principe, Cambodia and Indonesia.

1.2 General Overview of HCVs

High Conservation Values (HCVs) refer to biological, ecological, social or cultural values considered outstandingly significant or critically important at the national, regional or global level, and which require special measures for their maintenance and/or enhancement. The HCV concept aims to identify whether these values are present and to develop appropriate management and monitoring strategies to maintain and/or enhance the values. The concept was originally developed in 1999 by the FSC, and has since been widely used in the context of FSC certification for sustainable forestry. The HCV approach was adopted by the RSPO and

incorporated into the RSPO's first P&Cs in 2005. The six categories of HCVs and their definitions are presented in Box 1:

Box 1: HCV definitions

HCV 1: Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.

HCV 2: Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

HCV 3: Rare, threatened, or endangered ecosystems, habitats or refugia.

HCV 4: Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes.

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

HCV 6: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

Since there is currently no HCV National Interpretation for Nigeria, just as other previous HCV studies, the procedures and analyses of HCVs in this assessment relied heavily on, but not limited to, the Common Guidance for the identification of High Conservation Values by HCV Resource Network (Brown *et al.*, 2013), Common Guidance for the Management and Monitoring of HCVs by HCV Resource Network (Brown and Senior, 2014) and the HCV Assessment Manual prepared by Proforest for the HCV Resource Network.

Other information sources including the relatively recent reference: Guide to Conserving HCV Species and Habitats in West African Oil Palm Landscapes by ZSL (2013), an interpretation of global HCVF toolkit for use in Ghana published by WWF (Rayden *et al.*, 2006) and a similar version for Gabon by (Stewart and Rayden (2008) as well as expert opinions and views in wider contexts.

2.0 DESCRIPTION OF THE ASSESSMENT AREA

2.1 Site Description

The assessment areas, distributed within Okomu Main Estate are located between longitudes $5^{\circ}6'0''\text{E}$ and $5^{\circ}17'30''\text{E}$, and latitudes $6^{\circ}18'30''$ and $6^{\circ}26'30''$ in Ovia South West LGA of Edo State. The entire Okomu Main Estate is about 15,580 ha, out of which approximately 1,500 containing riparian forests and wetlands were conserved, and unaffected by previous oil palm plantation development activities (Figure 1). All the rivers within the estate, protected by the riparian forests, drain into the Okomu River in the south (Figure 2). The environmental HCV assessment covers the conserved areas, while the entire areas of the estate were considered for the social HCV assessment.

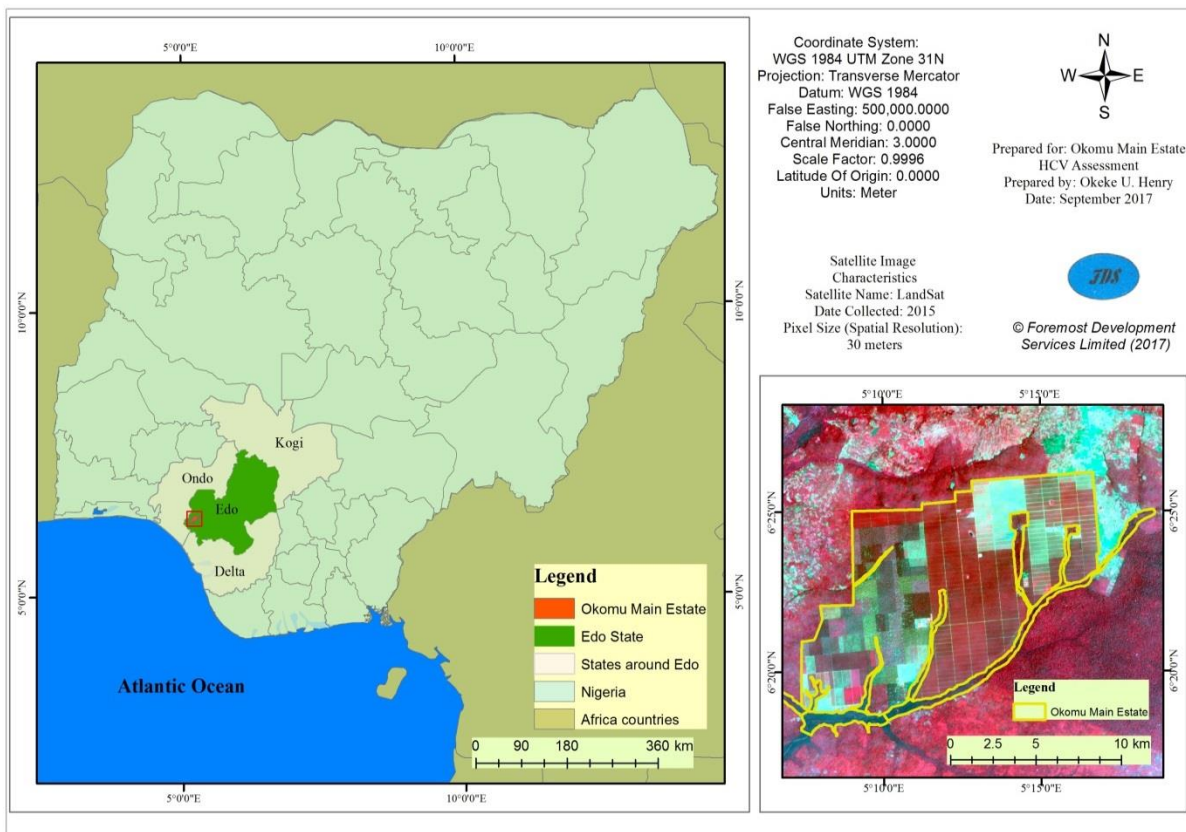


Figure 1: Map of the assessment area

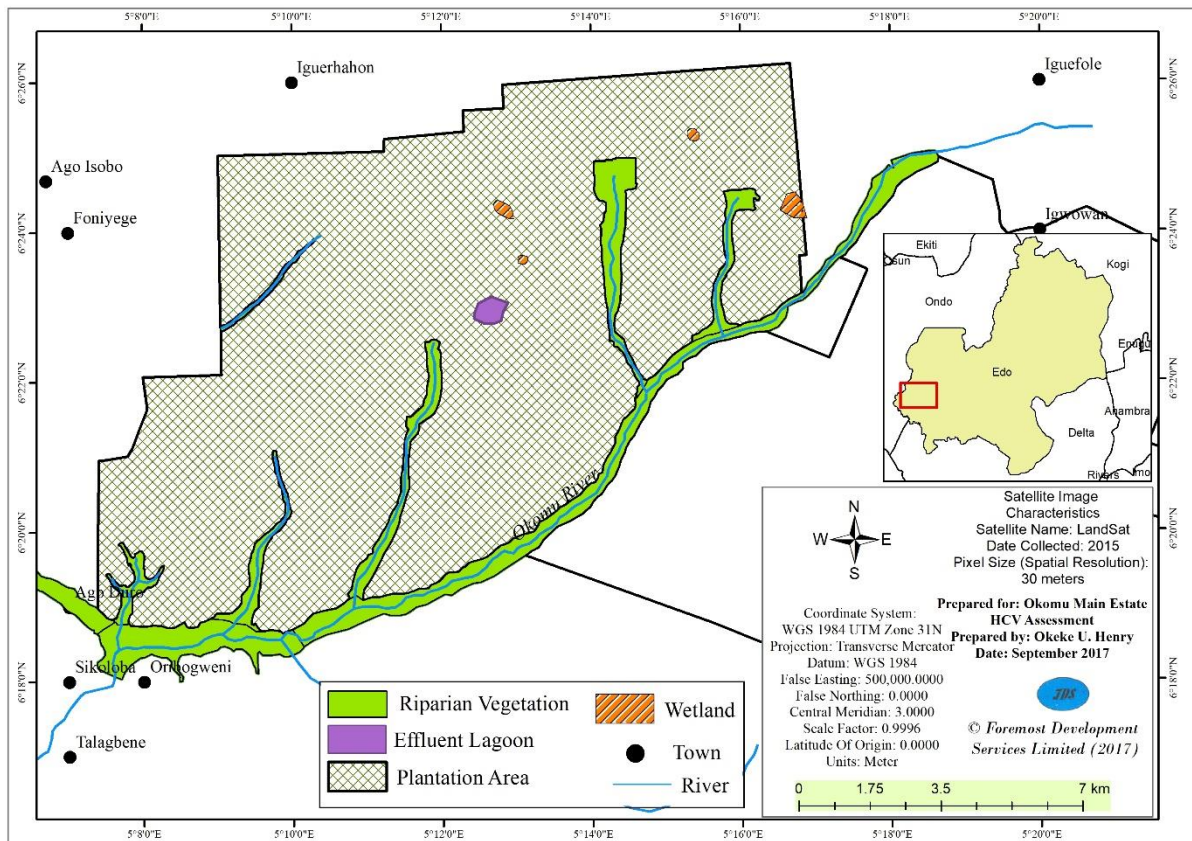


Figure 2: Map of the assessment area showing riparian forests and wetlands

2.2 The Landscape Context

The Okomu Main Estate’s dominant land use is oil palm plantation (8,488 ha) and rubber plantation in lesser proportion (5,451 ha). However, areas perceived to contain important biodiversity, and whose existence serves primarily to protect water bodies within the estate, have been left undeveloped, just as the wetlands within the estate (Figure 3). To reasonable extents, the conserved areas have been managed to preserve biodiversity components. The remaining parts of the estate comprise the Oil Mill, Nursery, Offices management and quarters. The main estate is located within the degraded Okomu Forest Reserve in Ovia South West LGA and surrounded by human settlements in scattered patterns. The LGA has an estimated land area of 2,803 km² (280,300 ha) and a population of 135,356 with density of 48 persons/km², and a growth rate of 2.74% (NPC, 2006).

The Okomu National Park separates the assessment area from the Extension 1 Concession, which is located in the de-reserved BC 9 of the Okomu Forest Reserve. The other blocks of the reserve consist of the now de-reserved BC 10 (now the main Okomu estate) and the Okomu National Park, which adjoins Extension I.

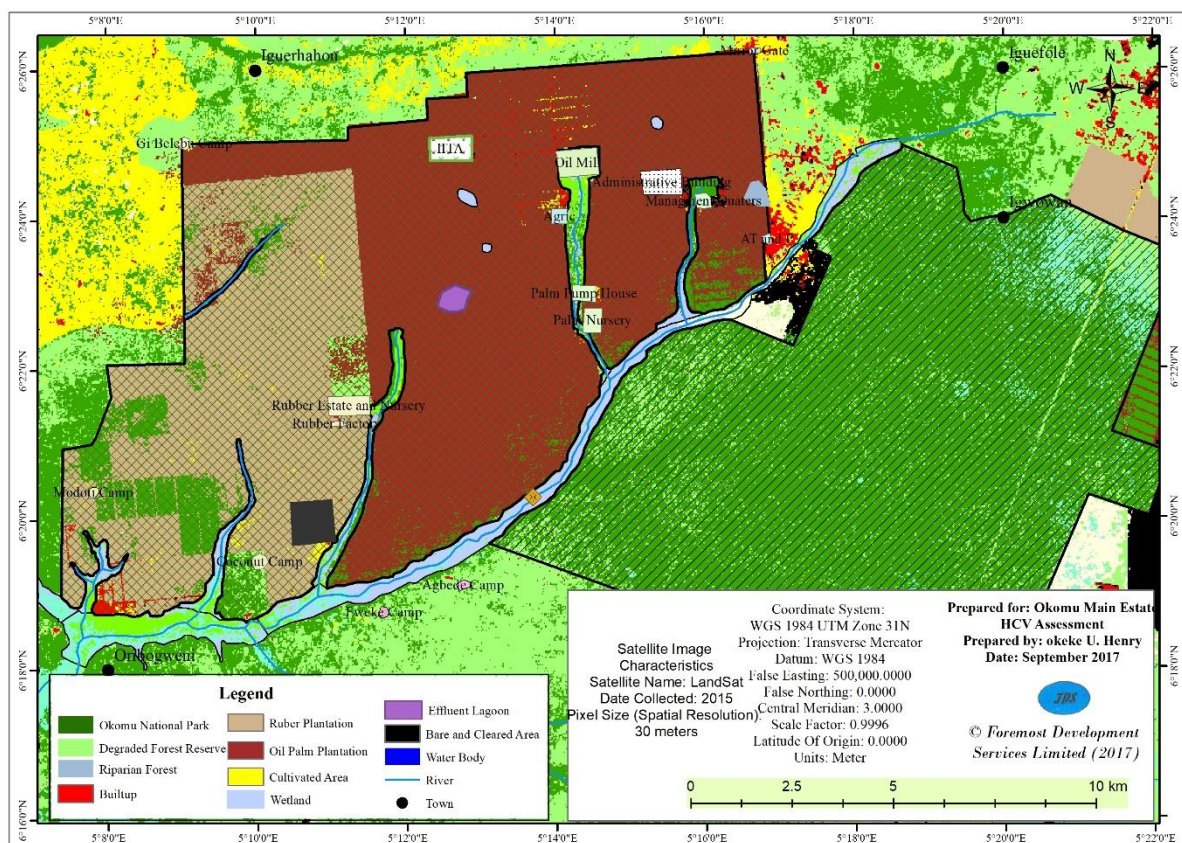


Figure 3: Map of the Landscape showing land-use types

2.3 Demographic and Socioeconomic Context

Just as the case with majority of Nigerians living in rural areas, with an average settlement having 5,000 or less inhabitants, out of the sixteen (16) assessed communities in the OOPC Main Estate, only five (5) have estimated population above 5,000. Four out of these five communities are still rural going by their infrastructural decadence with only one (Udo) being semi-urban. A dominant feature of the structure of the population of the affected communities is its significant skew towards young people with 79.3% of the total below the age of 45 years. Adults in the age group ≥ 45 years constitute about 20.7 % of the population. The total population of all the affected communities is 93,772. The sex ratio of the population in the assessed communities was 0.892:1 (i.e. 892 males to 1,000 females), which is lesser than Nigerian sex ratio of 1.026:1 (United Nations Department of Economic and Social Affairs-Population Division, 2015). The implications are that there are more vulnerable and dependent groups as well as quest for family labour, hence, the practice of polygamy. Therefore, the pressure on the few available resources would definitely be on the rise.

Generally, the level of government presence in terms of infrastructure and institutions in the operational areas of the OOPC is abysmally low. The few functioning amenities in some of these communities and camps are mainly provided by OOPC. The majority of the dwellers embark on journey on untarred rural roads, and virtually all the dwellers from camps travelled on bad untarred roads and paths, which consumed more time than necessary. Since time is a resource, the state of these roads contributes to income loss and impoverishes the assessed operational area's communities; many of them went through great difficulties to evacuate their farm produce from the farms to nearby markets due to bad road networks. In spite of few

boreholes provided by OOPC, in most communities and camps, people still fetch water from streams for their domestic use, which could be unsafe for their health and well-being. Healthcare, telecommunication, and electricity facilities are the least developed or non-existent in some areas. Seven (7) camps have neither government presence nor OOPC in the area of socio-infrastructure provision. These communities popularly referred to as camps are Ajebamidele, Makilolo (coconut camp), Obagie (provided with a borehole unit by OOPC), Obasuwa, Taye, Thousand Odoola and Utesi. It was also discovered that none of the communities have a Community Development Framework, and the infrastructural projects implemented, and those still being implemented by the OOPC are from wilful lists of individual communities through their respective committees. In addition, Makilolo has felt the presence of OOPC on regular basis.

2.4 Protected and Key Biodiversity Areas in the Landscape

There are no nationally protected areas within the main estate. However, the assessment area is separated from the famous Okomu National Park in the south by the Okomu River. The OOPC in its wisdom had isolated and managed some important biodiversity spots within the estate. These consist of riparian forests with attributes of tropical lowland rainforests, and swamps or wetlands scattered around the north-east corner of the estate. There are about six rivers, which originated from within the estate and drain into the Okomu River. There are fair representations of valuable economic timber species as well as non-timber forest resources in the conserved riparian forests within the estate. Some of which include *Diospyros zenkeri*, *Khaya ivorencis*, *Lophira alata*, *Lovoa trichilioides*, *Terminalia ivorensis*, *Terminalia superba* and *Irvingia wombulu*. Some of the Nigerian vulnerable and endemic faunas like Red-capped mangabey, White-throated monkey, Tree pangolin and Home's hinged tortoise are present within the riparian areas. The assessed area is also home to impressive populations of bird species, some of which include Yellow-casqued hornbill, African grey parrots and the Stream warbler, which have been classified as vulnerable and near threatened by IUCN. In addition, a number of economically important fish species such as Longfin tetra, Redbelly tilapia, Guinean tilapia, Banded Jewelfish, Rainbow Krib and African Pike are found in the water bodies within the estate.

2.5 Physical Features

Topographically, the entire Okomu landscape is generally flat and gently undulating with no steep slopes. The landscape is drained by the Okomu River and several of its tributaries. Due to the high level of the water table of the area, there are few areas in the estate, where the water table rises above ground level to form pools and marshes, most of which greatly contracts or completely dries up during the dry season. Located within one of the best tropical lowland rainforest areas of Nigeria, the area has high rainfall with mean annual rainfall of about 2,100 mm with the months of February to November being the main rainy period with three peaks, in June, July and September. The driest months of the area are December and January. Temperatures average about 25°C in the rainy season and about 28°C in the dry season. Mean monthly temperatures are 30.2°C with relative humidity of about 65% in the afternoons year round.

The landscape falls within a geophysical region known as Western Coastland, characterized by sedimentary rock of the Eocene Era. Soils in this area are generally acidic sandy loams, which are derived from deep loose deltic and coastal sediments generally referred to as the "Benin Sand". The landscape is generally flat to gently sloping land of less than 1% gradient. Several

small, perennial and non-perennial streams break up the topography of the area. Most of the small streams flow southwards into the Okomu River. Many of the smaller streams that occur in the area are fed by springs and flow year round.

2.6 National and/or Regional Context

The forests of Edo State form part of the Lower Guinea Forest Ecosystem, which extends from western Nigeria to the South-Western Cameroon. Together, the Upper and Lower Guinean Forest Ecosystems of this region constitute the Guinean High Forest Hotspot, which is home to some 9,000 vascular plant species (20% of which are considered to be endemic), over 785 bird species (of which 78 are known to be endemic) and some 320 mammal species (of which more than sixty are known to be endemic, including 18 primates). The Lower Guinea Forests are a centre of primate diversity, supporting 9 endemic primate species and IUCN Red Listed species such as African forest elephant (*Loxodonta africana cyclotis*), Chimpanzee (*Pan troglodytes ellioti*) and Nigerian white-throated guenon (*Cercopithecus erythrogaster*). However, the extent of the Guinean High forest has been reduced from an estimated 1,265,000 km² to 141,000 km², representing an estimated 85% loss in the last century as reported by CEPF (2000).

Nigeria is a diverse country with many different natural habitats, including savannas, tropical forests, wetlands, lakes, rivers and coastal areas. This diversity, coupled with diversity in landscapes and climatic conditions results in a corresponding diversity in the plants and animals. According to the National Biodiversity Strategy Report (2010), there are about 5,000 species of plants, 22,090 species of animals including insects and 889 species of birds. The Report further indicated the presence of over 135 reptiles, 109 amphibians, and 648 fish species with the forests of the Cross River State being considered as a hotspot for amphibian biodiversity. Threats to biodiversity and tropical forests in Nigeria result primarily from habitat degradation and unsustainable use, with the FAO reporting in 2005 that Nigeria had the highest deforestation rate in the world (FAO, 2005).

Nigeria is a signatory to several international conventions on conservation including the Convention on Biological Diversity, the Ramsar Convention, the Convention on International Trade in Endangered Species of wild fauna and flora and the Convention on the Conservation of Migratory Species of Wild Animals. In general, Nigeria's biodiversity is declining rapidly in the face of its burgeoning human population with about 70% residing in rural areas, and effective enforcement of laws and regulations in forest reserves and conservation areas is lacking. Much of Nigeria's important wildlife and forest resources are located in protected areas, but all of these lack real protection (World Bank, 1992).

The 2010 UN Global Forest Resources Assessment for Nigeria revealed that only 10% of Nigeria's land area or 10 million hectares was forested, and that approximately 400,000 ha of forest were lost annually. Nigeria's forest estates have suffered from severe overexploitation due to logging and widespread de-reservation for agriculture, industry and urbanisation. The ONP constitutes an extremely important biological feature in the landscape and country context, being a critical refuge for some of Nigeria's most threatened and high profile mammals. The assessment area shares border with ONP in the south-east corner through the Okomu River (Figure 4).

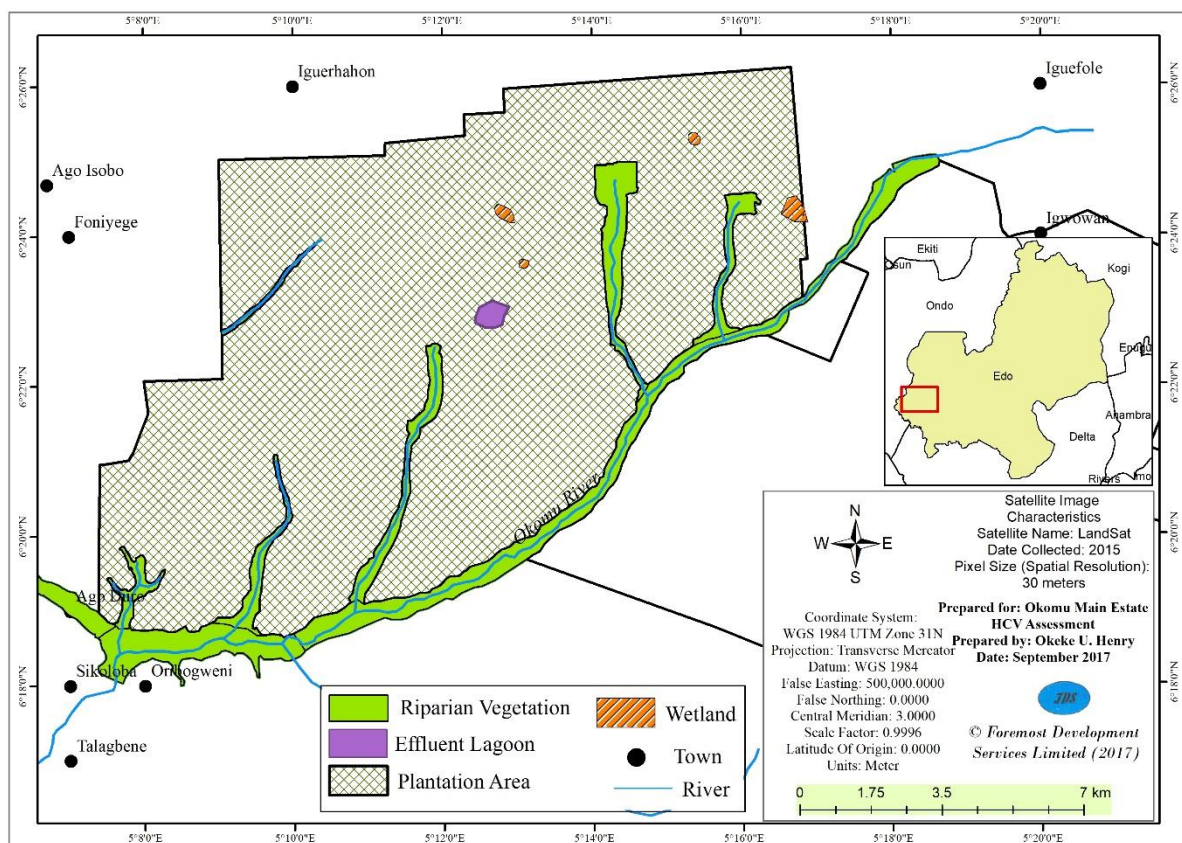


Figure 4: Map of the assessment area showing riparian, wetland and plantation

There are five types of protected area in Nigeria (Kalu and Izeke, 2006):

Forest Reserves (FRs): Owned by state governments and managed by state forestry departments. They aim to protect timber, fuel-wood and other forest resources, but allow resource harvesting under license. Forest Reserves are commonly overexploited with few remaining in good condition, and as of March 2014, 50% of Nigeria’s 994 forest reserves had been de-gazetted. The remainder are subject to increasing degradation, and with ineffective enforcement controls in place, appear to exist merely on paper as noted by Proforest (2016).

National Parks (NPs): Gazetted specifically for permanent protection of ecological, environmental or cultural importance and managed by the Nigerian National Park Service. Nigeria’s NPs cover approximately 2.5 million hectares or 2.5% of Nigeria’s land area.

Biosphere and Strict Nature Reserves: Areas set aside within FRs for scientific and educational purposes. All human activities such as hunting, logging and collection of timber/NTFPs are prohibited,

Game Reserves: Set aside to protect wildlife, and hunting is typically prohibited, except in a few cases where hunting is permitted under license.

Special Ecosystems and Habitats: Areas revered by local communities for spiritual, recreational, socio-cultural or economic reasons, e.g. sacred groves and streams. Sacred groves are particularly common in the south of Nigeria as the home of local deities, for example the Oshogbo Sacred Groove in Osun State (Proforest, 2016).

3.0 HCV ASSESSMENT TEAM

The HCV assessment process was led by a non-HCVRN ALS Provisionally Licensed Assessor, working together with a team of other experts knowledgeable and very conversant with local socio-economic, eco-biophysical and biodiversity conditions in different landscapes of Nigeria. Table 1 presents the key team members and their respective roles in this assessment.

Table 1: Summary of HCV assessment team experience

Name	Organization	Role	Expertise
F. A. Afolabi (M.Sc.)	Foremost	Project Coordinator, Lead Assessor <i>Natural Resources Expert</i>	Development Planning; Natural Resources, Social and environmental expert, stakeholder engagement
Dr. A. A. Adeyemi	Independent Consultant	Team Member <i>Floral Expert</i>	Forest inventory, botanical survey and ecology
Ahmeed .A. Olanigan(M.Phil)	Foremost	Team Member <i>Social Expert</i>	Social and environmental expert, stakeholder engagement
Dr. C. O. Akachuku	Independent Consultant	Team member <i>Floral Expert</i>	Botanical survey and ecology
Ukam Ibe	Independent Consultant	Team member <i>Floral Expert</i>	Forest inventory and botanical survey
Dr. D. I. Edet	Independent Consultant	Team member <i>Faunal Expert</i>	Faunal survey
E. T. Adebayo	Independent Consultant	Team member <i>Fishery Expert</i>	Fishery expert
F. A. Egwumah	Independent Consultant	Team member <i>Bird Expert</i>	Bird survey
H. U. Okeke	Independent Consultant	Team member <i>GIS Expert</i>	GIS expert

4.0 TIMELINES AND METHODS

4.1 Timeline for the Assessment

Following a scoping exercise in June and submission of full proposal in July, the field work for the biological HCVs started on 20 August through 28 August, 2017. Details of the assessment timeline are provided in Table 2.

Table 2: Assessment timelines

Process steps	Main activities	Timeline (2017)			
		Jun	Jul	Aug	Sep
Pre-assessment	Field scoping visit and stakeholder meetings Analysis of information Preparation of Full HCV assessment proposal	■			
Field assessment	Botanical survey, fauna survey, bird survey and fish survey Identification of social HCVs and participatory mapping Debriefing		■	■	
Stakeholder consultations	Consultations with communities, state and local government agencies, experts and NGOs			■	
Analysis and reporting	Analysis of field data and drafting of report			■	■
Finalization of report	Finalization and submission of report				■

4.2 Assessment Methods

The assessment processes were divided into two phases: the pre-assessment phase and full HCV assessment phase. The pre-assessment involved activities such as desk and web-based research, review of documents and licensed areas and a scoping exercise (including stakeholder consultation and rapid reconnaissance of the assessment area). Similar methods were employed for the full assessment, but these were much more detailed in application, including biological surveys (botanical and faunal surveys), community and stakeholder consultations and identification of social HCVs as well as participatory mapping.

4.3 Scoping

Foremost Development Service Limited conducted a scoping study of the Okomu Main Estate in June 2017 against multiple sustainability standard requirements. Desk-based information and key stakeholders consultations as well as the baseline socio-economic data were generated during the exercise.

4.4 HCV Tier Rating

The HCV Resource Network Assessor Licensing Scheme requires HCV lead assessors to rate each new HCV assessment according to a pre-defined tier rating system. Under the system, HCV assessments are categorised as either Tier 1 (high risk) or Tier 2 (low risk). The Tier rating is based on the level of perceived risk associated with the HCV assessment. A positive

response to any one of the questions in Table 3 results in classifying the assessment as high risk and therefore Tier 1. Table 3 analyses the risk rating of the OOPC Main Estate HCV assessment.

Table 3: HCV assessment Tier Rating

Indicators of potential risk and impacts	The assessment is Tier 1 if the response to one or more of the following is YES	Assessor's response
<p>Rating Scale of project: the overall area (ha) affected by production activities</p>	Will the operation cover or affect more than 50,000 ha	<p>No. The total area of the assessment area is approximately 15,580 ha, most of which already planted with oil palm and rubber</p>
<p>Intensity Conversion of natural ecosystem or habitat: a change from the natural ecosystem or habitat composition and structure to forestry plantation, agriculture or other land cover/ land use.</p>	Does natural or semi-natural vegetation or water, cover more than 40% of the area and conversion of more than 500 ha of the natural or semi-natural vegetation planned?	<p>No. The area covered by vegetation and water (already isolated for management) is about 10% of the total area in the assessment area, and no conversion is planned.</p>
<p>Risk Experience level of HCV assessor: while an assessor holds a provisional licence, a peer review is required as an additional means of quality assurance.</p>	Does the lead HCV assessor hold a provisional licence?	No.
Company with multiple projects in the same country	Does cumulative area to be converted exceed 500 ha across different plantations?	<p>No. No conversion is planned.</p>
<p>Threats to biodiversity: production activities that may disturb or damage a national or international priority biodiversity area</p>	Does the project area contain, border or overlap with any priority biodiversity areas?	<p>Yes. The assessment area shares border with ONP in the south-east corner.</p>
Area affected by operations	Would the operation cover or affect more than 100,000 ha	<p>No. The entire area of the assessment area is 15,580 ha.</p>
Fragmentation	Would the operations contribute to habitat or ecosystem fragmentation in the wider landscape?	No.
<p>Within certification schemes: If used outside of a widely recognised certification scheme, there is a higher</p>	Is the HCV assessment taking place outside of a	<p>No. The OOPC currently operates within the RSPO</p>

risk that complementary safeguards may be lacking.	recognized certification scheme?	certification scheme requirements, and Socfinaf (the parent company) is in the process of applying for RSPO certification.
Local and indigenous people: populations of people that overlap and/or use resources in the project area	Are there indigenous or local peoples living in or using the area?	No. The people living within the assessment area are staff members, who are only positively impacted by activities of the company without known conflicts of interests.
Opposition to the project	Are there NGOs or local population campaigns or organized opposition against the proposed project?	No. Since no conversion or new project is planned within the estate, the issue of opposition does not arise.
Company reputation	Does the company have a reputation for not protecting HCVs in this, or other places?	No. Okomu Oil Palm Company has a good reputation of isolating, and protecting areas perceived to be HCVs, or with potentials for HCVs.
Result		Tier 1 (high risk)

4.5 Desk-based Literature Review

A desk-based study was conducted to gather and analyze available relevant literature on the geo-physical landscape setting, faunal and floral studies, fisheries and on the socio-economic setting of the assessment area to support the identification of potential social HCV values. The team also reviewed reports and papers on the wider landscape, maps and the Customary Right of Occupancy and the Deed of Assignment.

4.6 Consultation with Government Institutions and Other Stakeholders

State-level institutions and organisations consulted included the Ministries of Environment and Public Utilities, Agriculture, and Lands & Survey. Consultation at the local level involved the Ovia South West LGA, which hosts the estate. The environmental NGOs that were consulted included the Nigerian Conservation Foundation and Nigerian Environmental Society. Reference was also made to the Environmental and Social Impact Assessment Reports on the estate. The local communities were consulted throughout the assessment process to help in the identification and mapping of HCVs (especially HCVs 5 and 6). The draft HCV Assessment Report was scheduled to be presented to a joint meeting of stakeholders for their comments before finalization of the report.

4.7 Socio-economic Survey and Communities Consultations

Communities' consultations aimed at identifying what the local population perceived as the potential impacts of the Okomu operations on them and their communities were conducted during the field work. A variety of approaches were used including public meetings, which were held in the surrounding communities. The public meetings involved a cross-section of all stakeholder groups including traditional leaders, elders, women, youth groups, farmers, fishermen, hunters and other identifiable groups. This was complemented by the report of the social impact assessment (SIA) recently conducted by Foremost Development Service Ltd.

4.8 Participatory Mapping

In order to assess local communities' use of resources from the assessment area, participatory mapping was carried out as part of the consultative meetings in each of the affected communities to determine the nature and distribution of utilized resources. The mapping approach was to present a map of the area with all the major landmarks at a Focus Group Discussion (FGD) or a wider community meeting to indicate the location of the particular resources mentioned during the meeting. The participatory mapping aids to provide clarity to the local communities on the concession boundaries and important features within the estate.

4.9 Assessment of Fauna and Flora/Biological Survey

The field verification exercise began with a reconnaissance visit led by Mr. Billy Ghansah, Agricultural Coordinator of the OOPC on the 21st of August 2017. During the field verification of flora, fauna and aquatic species, vegetation maps of the area were analyzed as part of the planning process for the field verification. The aims of the field assessments of flora and fauna in the estate were to:

- obtain a better understanding of vegetation cover in the estate;
- assess floristic composition of the vegetation of the area with focus on presence and abundance of species of conservation concern;
- assess the presence of faunal species in the area, their distribution and their conservation relevance;
- assess presence of aquatic species with a view to evaluating their conservation significance;
- identify rare, threatened and endangered ecosystems, if any.

The field data obtained from the survey were analyzed to identify the different biological HCVs as well as rare, threatened and endangered ecosystems present in the concession.

Floral Surveys

Given that only 1,500 ha (Riparian Forest) of the 15,000 ha Main Estate was to be assessed, and assuming that the Riparian Forest contains flora species, a total of 15 plots were laid in the different locations using purposive and systematic sampling techniques. The plots were well-distributed to ensure representative portions of all the sites in the assessment area were captured.

Using mostly existing plantation roads and trails as baselines, 500 m × 20 m (i.e. 1 ha) sample plots were placed at 500 m intervals and in a north-south direction, except on two occasions,

(and where the waters narrowed and meandered, and did not follow a straight course) with the aid of GPS and a compass. Data and information on trees within 10 m on either sides of the 500 m transect within the plot were recorded for each plot.

Field data collection consists of measuring the diameter and height of trees, identification of tree species, recording information on land cover and producing a species list including their IUCN categories. Each 500 × 20 m transect was sub-divided into 25 quadrats of 20 m × 20 m. There were 15 transects in the area. Within each transect, all trees with dbh ≥10 cm were measured. Also estimate of the height of each tree were obtained using a Spiegel Relaskop.

Faunal Surveys

Large and small terrestrial mammal sampling was carried out along 15 selected trails and transects in purposively distributed sampling plots. A minimum of one 500 m (0.5km) was searched on survey transects in each plot and at varied width across, depending on the nature of each of the habitats. Information on mammals was obtained by direct observation and record of signs in form of vocalizations, droppings and footprints, along trails and foot paths within the selected sampling plots.

Surveys on reptiles involved casual observations and refuge examinations of crevices, logs, decaying tree stumps, in leaf litter, termite mounds and burrows within the sampling plots. With the help of field guides (Happold, 1987; Wilson and Reeder, 1993; Kingdon, 1997), additional information on presence of some wild mammals was sought by interviewing resident staff of Okomu Oil Palm Company Plc. Pictures in field guides were shown to the residents to aid in the identification of the mammals not encountered during survey. Wildlife surveys were conducted between 0800 hours and 1830 hours.

Data on hunting activities was also generated in the course of the survey. Frequency of counts within the assessed blocks was used in generating relative densities of animal species encountered during survey.

Birds Identification and Survey Technique

A Bird survey was done using practical field identification as described by Nik and Ron (2008), and throughout the entire census the same principles was adopted. Census was conducted in the riparian forests and wetlands of OOPC Main Estate between 07.00 and 1100 hours, 1600 and 1830 hours in five days. Stratified random sampling was employed to accommodate riparian vegetation and wetlands in the area. Each of the blocks (including wetlands) was divided into homogenous transects of 500 m x 20 m covering an area of 1ha. A total of 15 transects were monitored to obtain a comprehensive data from the study site with a total size of 1,500 ha. The bird community was studied by transect count, twice a day as described by Gregory (2000). Transect route was assigned to each micro-habitat and each transect was expected to be covered in one hour mostly walking at a constant slow pace. Visit and observation were made using a binocular (10 × 42). All the birds seen and heard on both sides of the transects were identified and recorded by species. Bird species richness and relative abundance were illustrated using checklists in tables.

Ichthyofaunal Studies

Two to four randomly selected stations totalling twenty-five stations within the course of the ten (10) sampling locations basically made up of river, stream and wetland within the main estate were duly assessed as presented Table 4.

Table 4: Sampling points for *ichthyofaunal* studies at OOPC Main Estate

Location	Sampling point	Latitude	Longitude
<i>Riparian</i>			
Eroko	1	06°24'12.0"	005°15'50.1"
	2	06°23'58.5"	005°15'49.0"
	3	06°24'27.0"	005°15'54.0"
	4	06°24'22.0"	005°15'54.8"
Aguohen	1	06°24'28.4"	005°14'19.2"
	2	06°23'49.6"	005°14'16.8"
	3	06°22'57.6"	005°14'15.2"
Rubber 10.1	1	06°20'42.2"	005°09'48.8"
	2	06°20'42.6"	005°09'48.3"
	3	06°20'37.7"	005°09'50.8"
	4	06°20'35.1"	005°09'55.5"
Rubber 6.1	1	06°23'18.0"	005°09'44.3"
	2	06°23'17.8"	005°09'45.0"
	3	06°23'20.8"	005°09'46.3"
Umosan	1	06°21'25.3"	005°11'37.1"
	2	06°21'23.6"	005°11'36.7"
Okomu	1	06°18'38.5"	005°09'51.2"
	2	06°19'41.4"	005°12'41.3"
	3	06°19'36.0"	005°12'28.6"
<i>Wetland</i>			
A	1	06°25'19.5"	005°15'18.0"
	2	06°25'20.3"	005°15'19.6"
	3	06°25'17.6"	005°15'17.6"
B	1	06°24'16.7"	005°12'56.8"
	2	06°24'10.0"	005°12'54.7"
C	1	06°23'40.3"	005°13'03.0"

Since the rivers and the streams are very shallow, a modified Snorkeling and Scuba method as presented by APHA (1999) was adopted to assess the fish species. The fish were observed directly *in-situ* using Binoculars. Fish identifications were done with the aid of the Keys provided by Idodo-Umeh (2003), Sikoki and Francis (2007), Olaosebikan and Raji (2013).

5.0 ASSESSMENT FINDINGS/HCV IDENTIFICATION

This section presents an overview of the HCVs identified on OOPC’s Main Estate. For each of the HCVs, information is provided about its identification, current status and potential threats to their continued existence or enhancement. The definitions and identification used for the presence, potential presence or absence of HCVs follow the Common Guidance for HCVs identifications. Table 5 summarizes the presence and absence of HCVs in the assessment area.

Table 5: HCV presence or absence in the assessment area

HCV	Definition	Present	Potentially present	Absent
1	Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.	Present		
2	Landscape-level ecosystems and mosaics. Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national level and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.			Absent
3	Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.	Present		
4	Ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.	Present		
5	Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.			Absent
6	Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or Indigenous peoples.	Present		

5.1 HCV 1: Species Diversity

5.1.1 Definition

HCV 1 refers to areas that contain significant concentrations of species including rare, threatened, endangered or endemic species, unusual assemblages of ecological or taxonomic groups and extraordinary seasonal concentrations of species. It may also refer to areas that contain critical habitats that are used seasonally or in extreme years and which are needed for the survival of the species using these areas. All areas that contain such species or the habitats necessary for their continued survival may be considered as HCV areas.

HCV	Key question	Finding
1	Does the assessment area contain concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national level?	Present

5.1.2 Identification

Assessment of the HCV 1 was based on field surveys, literature review, and consultations with national experts and other stakeholders. Floral, faunal and ichthyological surveys were carried out in both the riparian forests and wetlands to ascertain the presence or absence of species in these categories as defined.

Flora

The assessment area is largely covered by oil palm and rubber plantations, and unplanted area of riparian vegetation and wetlands. The area of natural vegetation in the assessment area is characterised by riparian vegetation distributed within the main estate, occupying about 2,050.60 ha in land area (Figures 5).

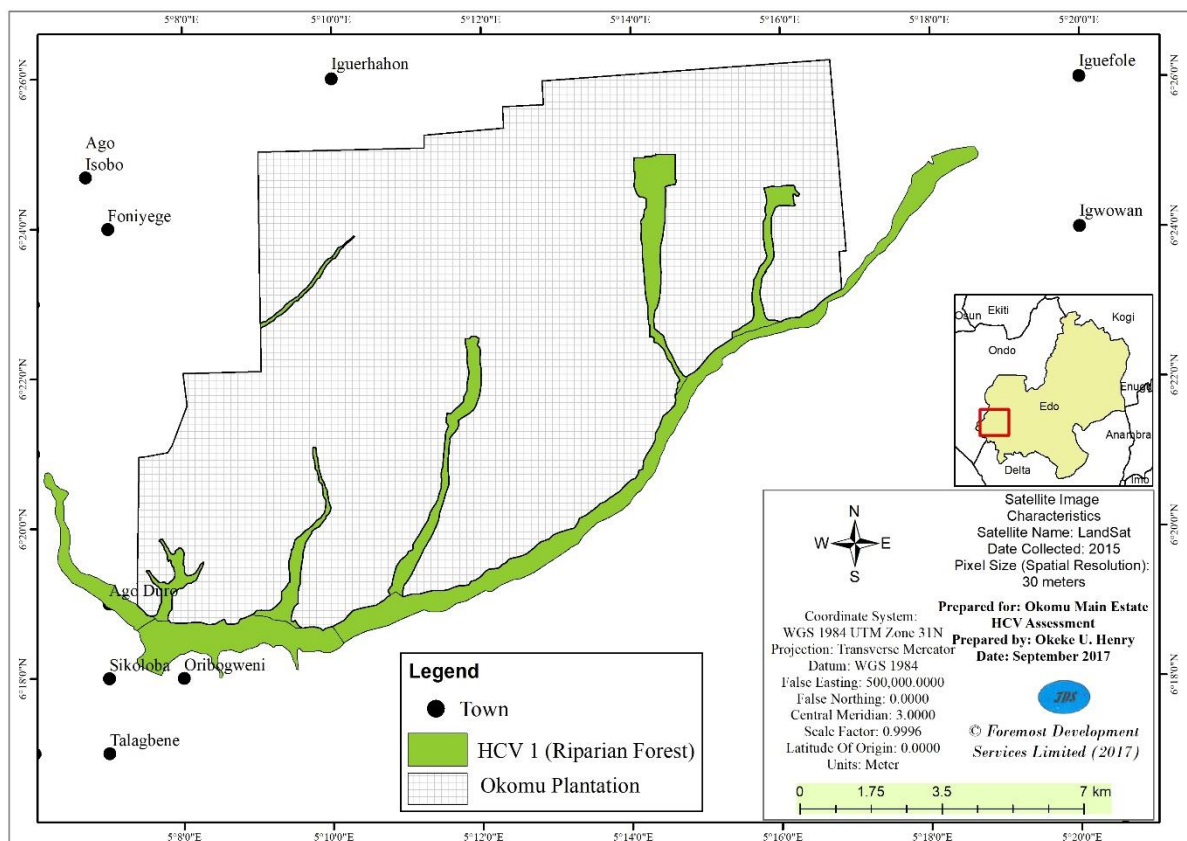


Figure 5: Map of HCV 1 locations within the concession

A total of 99 tree species belonging to 31 families with Dbh \geq 10 cm were identified to be present in the assessment area (riparian forests and wetlands) including the vulnerable, near threatened and critically endangered tree species. Out of this, 96 species were identified in the riparian with 13 species identified in wetland.

Fauna

There were five taxonomic groups comprising large mammals in three families (i.e. *Cercopithecidae*, *Suidae* and *Antelopinae*); small mammals 11 families, and herpetofauna from four families. Twenty-four (24) fauna species including four IUCN-classified vulnerable species (red-capped mangabey, *Cercocebus torquatus*; endemic white-throated monkey, *Cercopithecus erythrogaster*; tree pangolin, *Manis tricuspis* and Home's hinged tortoise, *Kinixys homeana*) were sighted. The order *rodentia* recorded more species (8) than *carnivora* (5), *reptilia* (5), *primata* (4) and *ungulata* (2).

Avifauna

Forty-four (44) bird species in 24 families, two and one of which have been classified in the IUCN Red List as vulnerable (i.e. Yellow-casqued hornbill, *Ceratogymna elata* and African grey parrot, *Psittacus erithacus*) and Near Threatened (i.e. Stream warbler, *Bathmocercus cerviniventris*) respectively. Moreover, all the bird species are ecologically important within the local Nigerian context. A host of other ecologically-important birds were encountered, some of which include African pied hornbill (*Lophoceros faciatus*) and Marabou stork (*Leptoptilos crumeniferus*), Common garden bulbul (*Pycnonotus barbatus*), African river martin (*Pseudochelidon eurystomina*).



African pied hornbill (N 06° 23' 03.9" E 005° 09' 29.1")



Marabou stork (N 06° 23' 29.7" E 005° 14' 08.6")



Common garden bulbul (N 06° 19' 32.1" E 005° 12' 18.7")



African river martin (N 06° 25' 15.4" E 005° 15' 30.8")

Fisheries

Eight (8) fish species belonging to five (5) families were identified in the area (Table 6). Only two of the recorded species are of commercial importance (i.e. *Coptodon zilli*, Redbelly Tilapia and African Pike, *Hepsetus akawo*). They accounted for 9.1% and 0.5% of the total recorded fish species, respectively. However, all the identified species have been classified as least concern in the IUCN Red List. Distribution of the fish species observed is shown in Figure 6.

Table 6: Summary of the identified fish species in the assessment area

SN	Family	Species	RD (%)
1	Cichlidae	<i>Hemichromis faciatus</i>	51.5
2		<i>Coptodon guineensis</i>	1.9
3		<i>Pelvicachromis pulcher</i>	5.6
4		<i>Coptodon zilli</i>	9.1
5	Alestidae	<i>Brycinus longipinnis</i>	25.9
6	Hepsetidae	<i>Hepsetus akawo</i>	0.5
8	Anabantidae	<i>Ctenopoma kingsleyae</i>	1.3
9	Cyprinidae	<i>Barbus callipterus</i>	4.0
Grand Total			100

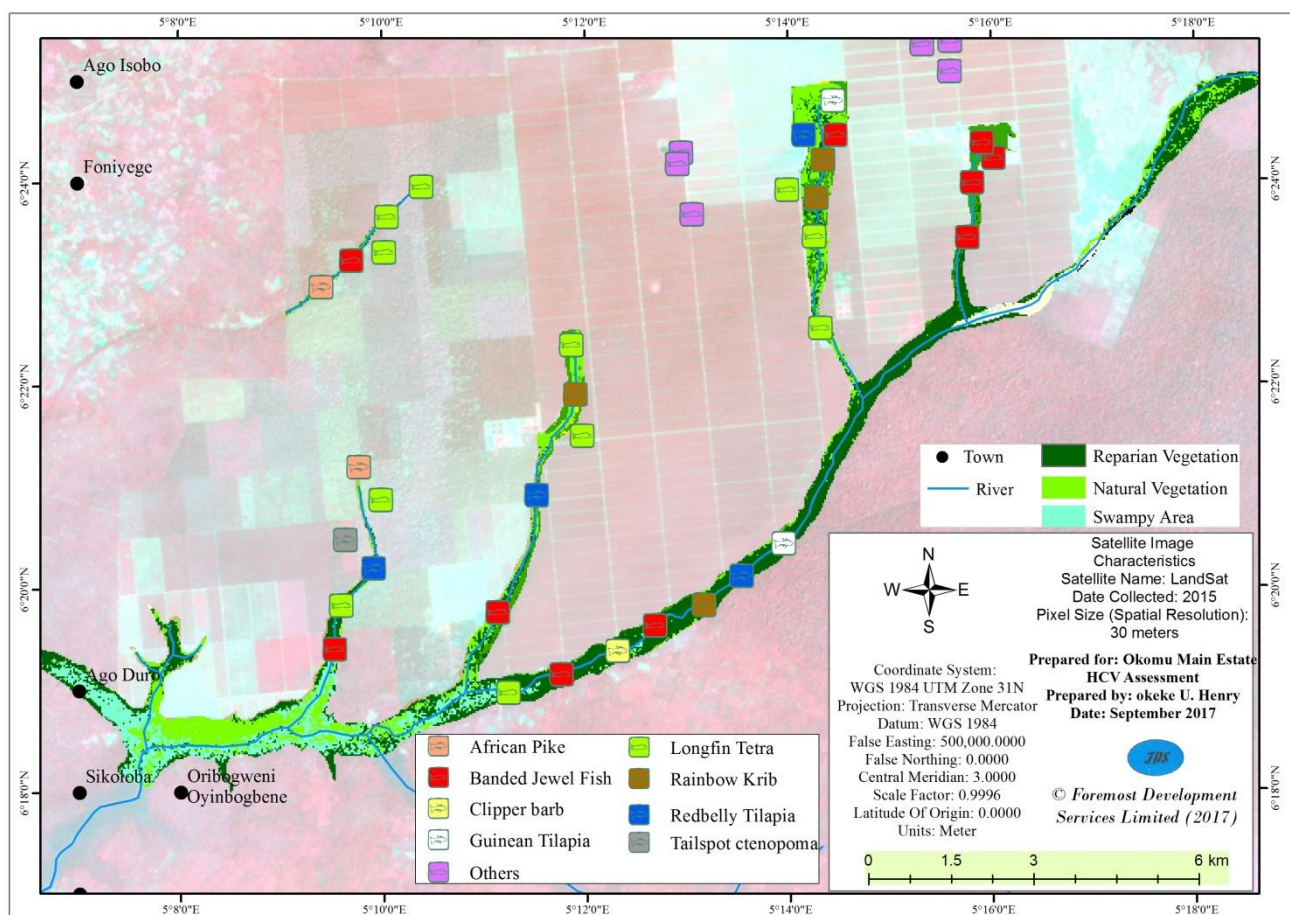


Figure 6: Fish species distribution in the water bodies of the assessment area

5.1.3 Discussion and Justification

The flora result of the study of the assessment site revealed that the dominant tree species were *Leguminosae*, *Fabaceae* and *Compositae* represented by 19, 9 and 8 tree species respectively. All the representatives of the three families have been reported to occur commonly in the wider landscape, particularly the tropical rain forests of southern Nigeria. Eleven (11), 1 and 1 of the flora species identified in the assessment area have been classified as Vulnerable, Near Threatened and Critically Endangered on the IUCN Red List.

Among the identified mammals, the red-capped mangabey (*Cercocebus torquatus*) and the endemic white-throated Monkey (*Cercopithecus erythrogaster*) are listed as Vulnerable in the IUCN Red List of Threatened Species (IUCN, 2017). According to IUCN (2012), a taxon is Vulnerable when the best available evidence indicates that it is considered to be facing a high risk of extinction in the wild. Thus, at the global level, these vulnerable species qualify the assessment area for HCV 1.

At the regional level, all the mammalian species (with the exception of the red river hog, Zebra mouse and wild cat) encountered are of WCMC importance as indicated by their CITES Status as 'I'. At the national level, the Endangered Species Decree 11 of 1985 places several faunal species into schedules (1, 2 and 3), and most of the species encountered in the assessment area are either in Schedule 1 or 2. According to the Decree, Schedule 1 animals are those in relation to which international trade is absolutely prohibited, while Schedule 2 animals are those in relation to which international trade may only be conducted under license. These species

among others are currently protected by CITES and Nigeria’s Endangered Species Decree 11 of 1985. Thus, the global, regional and national statuses of the species encountered during survey justify the HCV 1 status of study area.

Five (5) reptilian species were encountered during the survey, and these are the royal python (*Python regius*), Gaboon viper (*Bitis gabonica*), Nile monitor lizard (*Varanus niloticus*), Home’s hinged-back tortoise (*Kinixys homeana*) and Ondo forest gecko (*Cnemaspis petrodroma*). In the IUCN Red List, the Home’s hinged-back tortoise is classified as Vulnerable. Though not categorized by the Endangered Species Decree 11 of 1985, all the reptiles encountered except Ondo forest gecko possess WCMC status. Presently, these reptiles like other wildlife species in Nigeria are affected by habitat loss, and any conversion or disturbance in the riparian zones may threaten their continued existence.

Edo State is rich in biodiversity compared to other states of the country and it houses equivalent levels of endemism and species richness due to a composite topography and wide diversity of habitats for wild birds. The ONP, which shares some boundary with the assessment area through Okomu River, has been identified as an Important Bird Area (IBA) by Birdlife. Therefore, it is considered to be a critical refuge for some of the Nigeria’s most threatened and high esteem birds. Three of the birds species identified are listed on the IUCN Red list as Vulnerable (*Ceratogymna elata* and *Psittacus erithacus*) and Near Threatened (*Bathmocercus cerviniventris*). Moreover, all the 44 bird species encountered are under schedule 1 of the WCMC. In view of the foregoing, **HCV 1 is concluded to be present in the assessment area** (Annex).

5.2 HCV 2: Globally, regionally or nationally significant large landscape level forest

5.2.1 Definition

HCV 2 refers to globally, regionally or nationally significant large landscape ecosystems contained within or containing the management unit, where viable populations of most, if not all naturally-occurring species, occur in natural patterns of distribution and abundance. Generally, areas that form part of, or serve as a linkage between larger forest complexes and can thus provide connectivity between two or more forest fragments and/or act as a wildlife corridor for the movement of animals between various habitat areas may also be considered as HCVs. A threshold of 50,000 ha is widely accepted.

HCV	Key question	Finding
2	Does the assessment area contain, or form part of a regionally or nationally significant large landscape forest, or does it adjoin such forests of up to 50,000 ha?	Absent

5.2.2 Identification

HCV 2 includes ecosystems and ecosystem mosaics that are sufficiently large and relatively undisturbed enough to support viable populations of the great majority of the naturally occurring species, and the great majority of other environmental values occurring in such ecosystems. It refers mainly to large landscape-level forests that are generally intact, and where ecological processes and ecosystem functioning are largely unaffected by recent anthropogenic activities.

5.2.3 Discussion and Justification

The assessment area dominated by developed commercial oil palm and rubber plantations, riparian forests and wetlands, in its entirety occupies 15,000 ha land area of which the riparian forests and wetlands cover 1,500 ha in land area. On a large landscape, the only large contiguous block of forest cover in the landscape is the 20,000 ha Okomu National Park. Other parts of the Okomu Forest Reserve are already degraded and littered with cocoa and arable farmlands. The assessment area has very limited connectivity to the ONP and no connectivity to any other protected areas or forest reserves. Outside the ONP, which is several kilometres distant from the assessment area, there is no natural vegetation, which would form a large (i.e. $\geq 50\,000$ ha) contiguous area of natural ecosystem or habitat. Therefore, HCV 2 is most unlikely to be present. Hence, **HCV 2 is confirmed to be absent**.

5.3 HCV 3: Rare, threatened or endangered ecosystems

5.3.1 Definition

HCV 3 refers to areas with ecosystems that are naturally rare due to geographical or climatic factors limiting their distribution and development or ecosystems whose extent and/or distribution has been reduced by anthropogenic activities.

HCV	Key question	Finding
3	Does the assessment area fall within or contain an ecosystem that is considered to be rare, threatened or endangered? Or can it be considered as one, whose extent and/or distribution has been reduced by past anthropogenic activities?	Present

5.3.2 Identification

Nigeria contains different types of vegetation that include tropical rainforests, arid savannah, coastal mangroves, freshwater swamps forests, etc. Though there are no recent detailed mappings of the vegetation cover or an assessment of threats against them. It is generally accepted that the country's forest cover has been reduced in extent drastically in the past decades by a series of anthropogenic activities resulting in loss of faunal and floral diversities due to use-pressure. Hence all existing forests, where found in the country, are a priority for conservation.

Although, no reference toolkit exists for Nigeria, extensive consultations with experts combined with the use of the precautionary approach has resulted in consideration of the following types of vegetation as HCV 3, as adopted by Proforest in previous studies:

- i. All areas containing **intact natural forest vegetation**. This is due to the fact that the natural forest cover of the country has been significantly reduced in extent;
- ii. All areas with montane forests- due to their rarity at the national level;
- iii. All areas containing mangroves and **swamps** due to their rarity and threat to their continued existence and
- iv. Areas with coastal low forest.

Intact Forest Vegetation and Wetlands

Two of the riparian forests (i.e. behind Management Quarters and Oil Mill) in the assessment area are fairly large in extent, based upon the disappearance rates of Nigerian forest estates. One area contains a good number of *Irvingia wombulu* stems, already matured to fruit during season, and parts of which are closed canopy. The wetlands are also unique in their right for attracting viable populations of important bird species and other faunas. No indication of logging activities in the riparian areas. In the same vein, dry season farming, which is typical of swamps, was unnoticed in the wetlands.

5.3.3 Discussion and Justification

Given the high deforestation rate and diversification of the economy, with more bias for agriculture, riparian forests and wetlands are becoming rarer in Nigeria. There are five swamps or wetlands within the assessment area; such are hardly spared in other areas within the tropical forest zones of the country. The riparian forests harbour an impressive population of economically important tree species that are very rare on a national scale, and unavailable in most of the reserve or other gazetted and protected natural habitats. The existence of most of these species is threatened by habitat loss and very long gestation periods in wider landscape or national contexts.

Moreover, the riparian forests contain the highest abundance and diversity of species of conservation interest, compared to elsewhere in the assessment area. Results from the faunal survey showed that most of the species of conservation interest found here are ‘forest zone’ species, adapted to a forested ecosystem.

According to a report by Proforest (2016), due to the past high deforestation rates and the increasing area under cultivation, lowland swamp forests with natural species composition are rare in the country. This means that any significant area of good quality lowland forest would almost certainly qualify as HCV because the ecosystem has become so rare due to anthropogenic causes. Therefore, **HCV 3 is confirmed to be present in the assessment area.** The total area for HCV 3 is 25.409 ha (Figure 7).

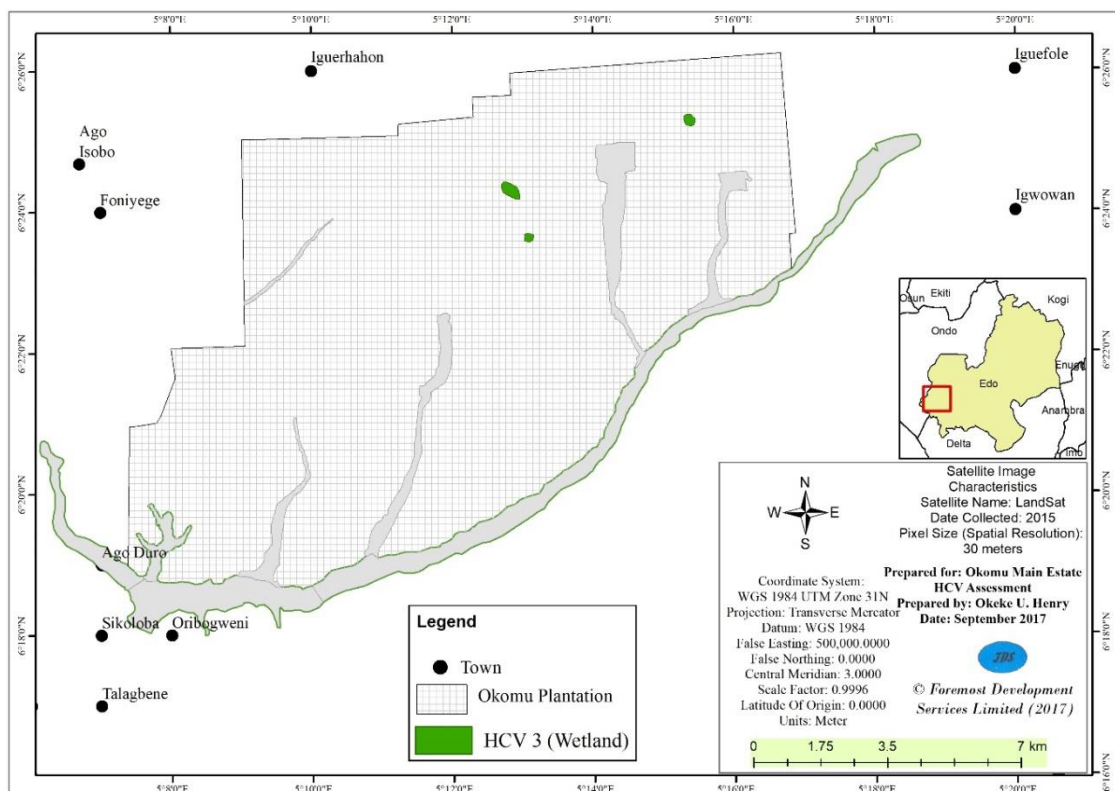


Figure 7: Map of HCV 3 locations within the concession

The total area of the riparian forests and wetlands is about 2,076 ha. Although there are no indications that these areas would be affected by development activities in the nearest future, it is not recommended, should there be any plan to do otherwise.

5.4 HCV 4: Forest areas that provide basic services of nature in critical situations

5.4.1 Definition

HCV 4 refers to areas with basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes. These services include flood regulation, water purification, climate regulation, nutrient cycling.

HCV	Key question	Finding
4	Does the assessment area, or parts of it provide basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes?	Present

5.4.2 Identification

HCV 4 covers ecosystem services for which their disruption could result in the “threat of catastrophic, or cumulative negative impacts on the welfare, health or survival of local communities, or on the functioning of important infrastructure (roads, dams, reservoirs, hydroelectric schemes, irrigation systems, buildings, etc.), or on other HCVs.” The concept of critical situations covers cases where either:

- i. There are no viable, readily available or affordable alternatives, or

- ii. The loss/damage to an ecosystem service could cause serious prejudice/suffering to recipients either immediately or periodically.

This typically covers, but is not limited to, areas that:

- Protect watersheds, regulate stream flow and prevent potentially catastrophic floods,
- Prevent the spread of fires, or
- Control erosion of vulnerable soils and slopes.

Furthermore, the HCV Common Guidance on HCV Identification lists the following as potential indicators of HCV 4:

- Provision of clean water, where local communities depend on natural rivers and springs for drinking water, or where natural ecosystems play an important buffering or stabilising role.
- Remote and/or poor rural areas, where people rely directly on natural resources to supply most of their needs, including water,
- Upstream of extensive or important wetlands, fish nurseries and spawning grounds, or sensitive coastal ecosystems (e.g. mangrove forests, coral reefs etc.),
- Upstream of important municipal water sources,
- Steep or mountainous areas, or areas of high rainfall, where the risk of catastrophic erosion is high,
- Where there is naturally low soil fertility, especially on sandy, peaty or fragile soils, where land clearance, drainage, use of heavy machinery or other intensive land use might affect soil structure and fertility,
- Arid or dry land areas particularly susceptible to erosion and desertification.

5.4.3 Discussion and justification

Control of erosion and slopes

Generally, the risk of critical soil erosion in and around the Okomu National Park appears low as a result of the area's low-lying topography. For example, elevation at the assessment area is ≤ 104 m with an average of 67 m above sea level.

Prevention of spread of fires

Similarly, the risk of destructive wildfires is virtually non-existent in the area. The area is located within a moist rainforest zone of the country with a relatively short dry season. Extensive and destructive wildfires are generally limited in this area of the Edo State. Wildfire is not deemed to be a major threat in the area and no parts of the estate can be considered as serving as a protective barrier against destructive wildfire.

Provision of clean water and protection of riparian vegetation

Riparian vegetation protects water quality by trapping sediments and pollutants associated with run-off during rainfall, helping to recharge underground aquifers, dissipating stream energy during floods, and providing detritus for aquatic organisms. A reduction in the vegetation cover of riparian areas can thus lead to increased sedimentation and eventual siltation, which will result in a marked decrease in the quantity and quality of the water bodies. By supporting aquifer recharge and maintaining stream flow, the riparian vegetation ensures maintenance of water quantity and quality. Therefore, the riparian forests within the estate play crucial roles in supporting and regulating ecosystem services including flood regulation/buffering and water

purification since most of the rivers and streams in the assessment area originate from the riparian vegetation.

Moreover, the Okomu River in the southern boundary of the assessment area is an important source of water and fishing for some Ijaw communities along the southern boundary, especially those at Coconut and Agbede Camps. In addition, the five wetlands in the assessment area are important ecosystems, providing refuges for unique species of avifauna. In view of the foregoing, the riparian forests along with wetlands are **confirmed to be HCV 4**, with a total lengths of stream and river networks of 80.38 km (Figure 8).

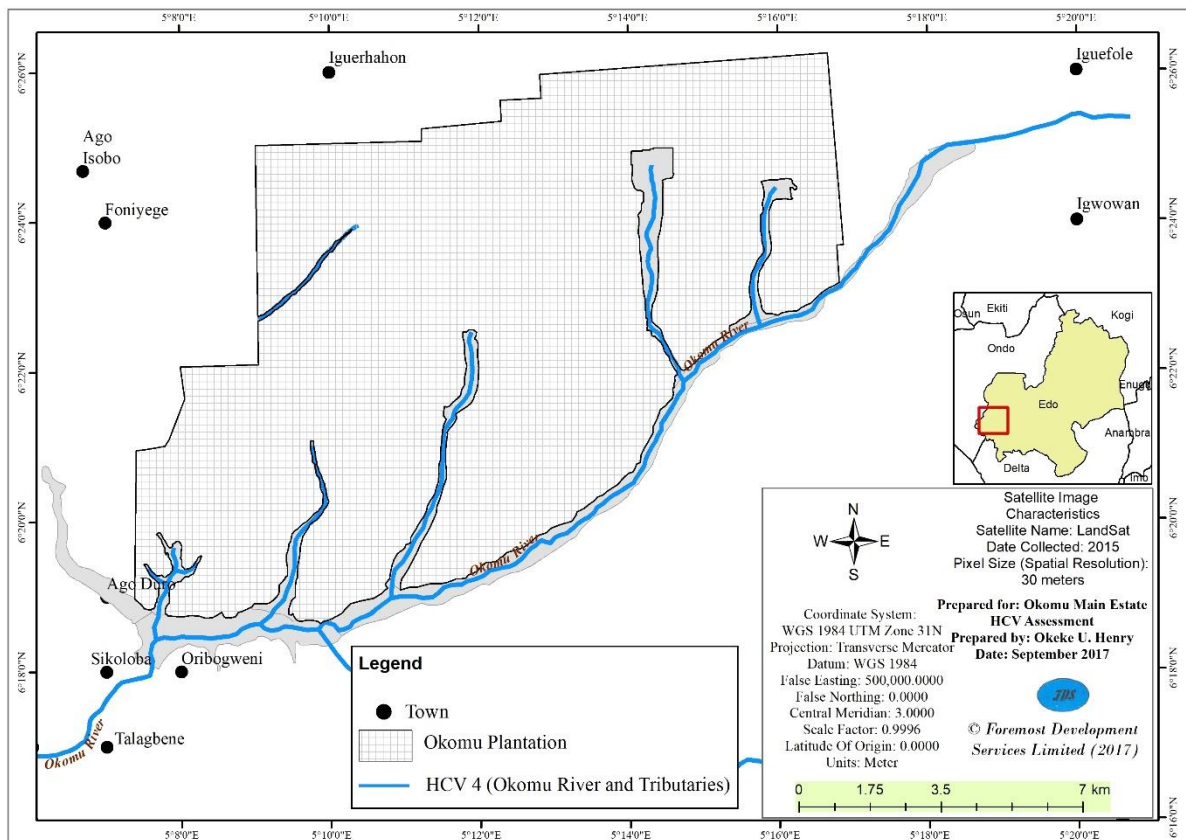


Figure 8: Map of HCV 4 locations within the concession

5.5 HCV 5: Areas fundamental to meeting basic needs of local communities

5.5.1 Definition

HCV 5 areas are those that are fundamental to meeting basic needs of local communities (e.g. subsistence, health and nutrition, etc.).

HCV	Key question	Finding
5	Does the assessment area contain resources that are fundamental to meeting the basic livelihood needs of the local communities, e.g. (subsistence, health, nutrition etc.)?	Absent

5.5.2 Identification

An area is considered as HCV 5 when it is the source of basic needs in a situation where the majority of the local people or the poorest populations have no realistic alternative. This includes areas that are of essential importance for local communities as substantial and irreplaceable sources of food, medicines, fuel, household water and other basic needs. Where these goods and services are localized in a particular area within the natural environment and where they serve as a crucial source of livelihood for the communities in situations where no realistic alternatives exist, these goods and services would be identified as HCVs and the areas needed for their maintenance set aside and managed appropriately.

5.5.2 Discussion and Justification

Most of the communities in and around the assessment area source their water from boreholes provided by the OOPC, hence, there were no signs of dependence of the communities on rivers and streams for water in the assessment area. Okomu River offers some means for subsistence fishing areas, such cannot be considered irreplaceable as alternative sources of protein (e.g. domestic poultry and livestock as well as meat bought from the local market) abound. Therefore, these resources are not fundamental to meeting basic needs and livelihoods of the local communities. Very minimal and negligible fishing activities were noticed in other water bodies within the assessment area, and as such do not qualify as HCV 5. The critical roles played by these water bodies were already captured as HCV 4.

Hunting remains an important source of protein. However, known hunting activities are carried out outside the assessment area. Although signs of illegal hunting were evident on some occasions in the riparian forests behind Oil Mill, Labour line, and a secondary forest at IITA, these are not considered indispensable sources of protein and/or livelihoods. In addition, local hunters have indicated that the species of animals they hunt are dispersed throughout the landscape.

It was revealed during public meetings and focus group discussions that NTFPs were generally not considered as critical sources of livelihoods. Additionally, the NTFPs are diffused in the landscape and were noted not to be collected from within the assessment area. Furthermore, the communities do not rely solely on medicinal herbs, barks, etc. to meet their healthcare needs since they are able to access healthcare from health centres at the OOPC, Udo and Benin.

Most timber and poles for building and construction material is sourced from patches of natural vegetation in and around communities. These are completed by purchases from larger towns such as Udo and sometimes Benin City, and none of such is obtained from the riparian forests within the estate. The area is not a source of poles and timber for nearby communities.

Although the surrounding communities are predominantly agrarian and a number of the local people have encroached the degraded Okomu Forest Reserve, there were neither evidences of private farming nor potentials within the assessment area. Therefore, **HCV 5 is considered to be absent** in the assessment area.

5.6 HCV 6 Areas critical to local communities' traditional cultural identity

5.6.1 Definition

An area is considered to be HCV 6 if it contains any resource or value that is considered to play critical socio-cultural or religious function. This may include areas that are set aside as sacred forest or **sacred trees** and **servicing as the home to deities or ancestors**.

HCV	Key question	Finding
6	Are there sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples?	Present

5.6.2 Identification

Sites of national or global importance

This includes archaeological, UNESCO World Heritage and cultural heritage sites and all other similar sites of national importance. None of such sites are present within the assessment area as confirmed from stakeholders interviewed and extensive literature search.

Sites of local cultural/traditional or religious importance

These areas are also known as sacred groves in some countries or localities. In Nigeria, some patches of forest/natural vegetation may be considered as 'evil forest' and are generally set aside from all forms of intrusion and conversion - the belief being that any person, who intrudes into such areas would bring a curse to himself and the community as a whole. Additional customs that may qualify as HCV 6 in Nigeria include:

- Sacred/totem animal or **plant species** that are thought to contain spirits or the soul of the community and should not be disturbed, killed or felled.
- Intangible taboos such as *taboo days* on which no entrance into the forest or farms is permitted. These may be one day of the week set aside on which the *gods* and *ancestors* rest; a particular day within the year for religious festivities or random days that are dictated by the *oracles* for the performance of traditional or religious rites.

5.6.3 Discussion and justification

Within the assessment area, there is a '**Life Tree**' (*Newbouldia laevis*), shown in Plate 1, which is located behind the Club House in front of Odionwere's house at Staff Quarters (Labour line). The shrine, worshipped by Udo community, is currently contained in a short fence but its presence within the workers' abode and close to daily operations exposes it to the risk of possible desecration, and is therefore **considered as HCV 6**, which is within less than 100 m² (Figure 9).

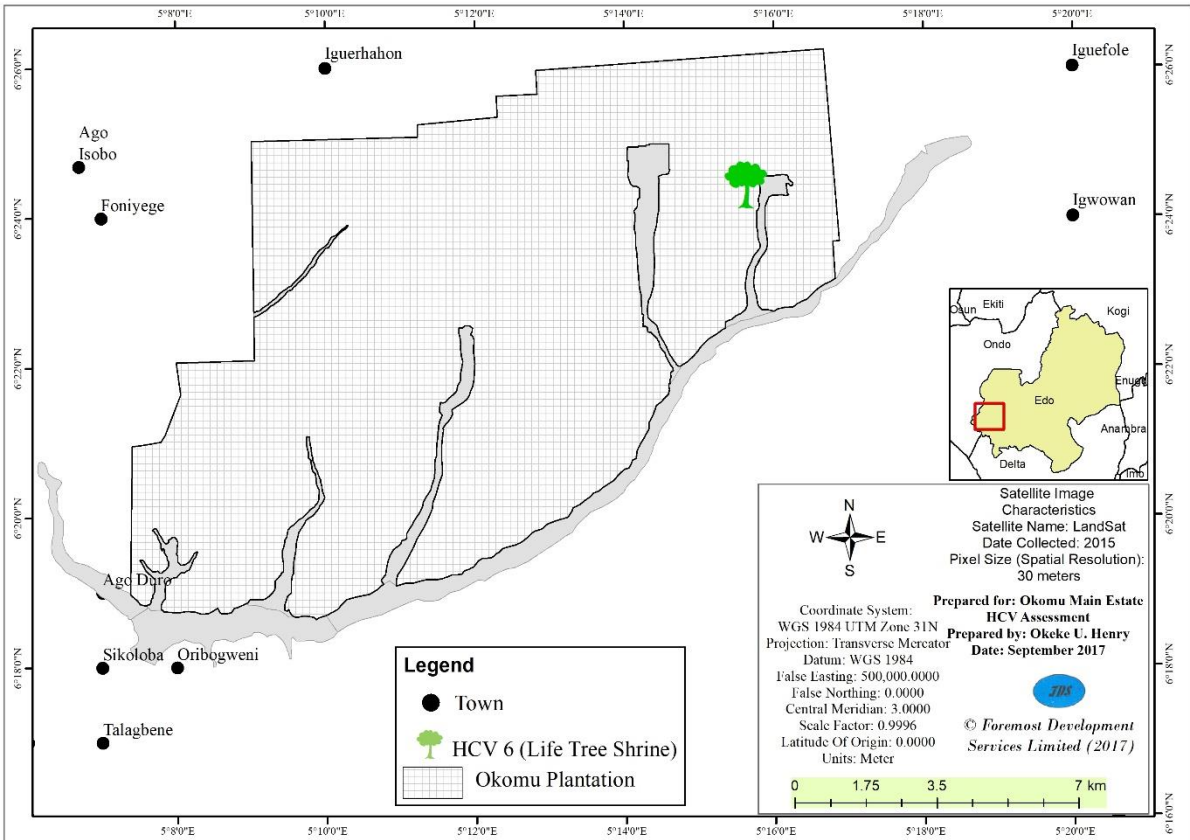


Figure 9: Map of HCV 6 location within the concession



Plate 1: Life Tree (*Newbouldia laevis*), behind Club House (N 06°24'24.9", E 005°15'37.6")

According to the Iyase of Udo, the life tree is usually planted at specific locations in new settlements on Udo land and used for spiritual consultations and prayers to address and avoid calamitous occurrences. He further noted that the Odionwere has traditional responsibility for its tending and protection, and together with the community of settlers, ensure their protection in practice.

5.7 STAKEHOLDER CONSULTATIONS

The stakeholders' meetings were organized to interact with all concerned persons including government officials, NGOs, representatives from host communities, experts and OOPC representatives (Plate 2). These were to enable all affected parties to share comments and/or concerns they may have in respect of OOPC operations and activities in general, and specific issues to the identified HCVs as well as threats and potential threats to the HCVs. Table 7 presents the outcomes of the stakeholder consultations.



Plate 2: Cross-section of participants at the stakeholders' consultation meeting

Table 7: Outcome of stakeholder consultations held 25th October 2017

Name of stakeholder	Comments/concerns raised	Assessors remarks
Mr. Abdulahi Ahmed CP, Okomu National Park	The conservator of the park (CP) noted the need to partner with OOPC since the two parties share borders, and that whatever affect the HCVs within the OOPC Main Estate would affect the ONP, and vice versa. He pointed out that operations and activities of the OOPC have significant effects on the survival of the wildlife in the park with Okomu River linking the two. He expressed satisfaction about the existing relationship between OOPC and ONP as well as proposing a joint monitoring team. The CP stated that the two are already involved in training Eco-Guard and security staff of OOPC on wildlife monitoring, and that there is need to formalize the agreement on training and establishment of wildlife corridors. He however expressed displeasure over the problems of illegal loggings in the park through licences given by the State Forestry Department and those perpetrated by armed militants. He added that OOPC was ready to partner with all interested and well-meaning organizations as exemplified in the OOPC recent donation of a patrol vehicle to the ONP.	We are glad to hear that OOPC recently donated a patrol vehicle to ONP to assist in operations, which indicates a very good relationship between OOPC and ONP.
Dr. Joseph D. Onoja, Technical Director, Nigerian Conservation Foundation (NCF)	Dr. Onoja expressed worries about some of the resident OOPC staff being involved in any form of hunting within the estate. He therefore emphasized re-orientation and the need to train staff of the OOPC and rangers of ONP on how to monitor the identified biological HCVs, especially faunas. He suggested enhancement of the cultural HCV (Life Tree Shrine) through propagation. He stated that OOPC should always keep open doors to all NGOs and other stakeholders and engage them in the interest of fair play.	Noted
Hon. M.E.O. Osaigbovo, Edo State Commissioner for Agriculture and Natural Resources	Hon. Osaigbovo noted the need for all parties to be operating on the same page as far as conservation of the identified HCVs is concerned. He gave assurance of the Edo State Government to assist any other company willing to develop the state as demonstrated by OOPC in terms of large-scale employments.	Noted
Mr. Vincent Eko, VITOJE NIG. ENT.	He pointed out that there should be cooperation between the OOPC and surrounding communities for a smooth operation. He is of the opinion that the OOPC presence has been of great benefit to surrounding communities in terms of several infrastructural projects already completed by the company and in-use by those communities.	No response
Mrs. E.O. Agie, Okomu Primary School	She stated that the school is already doing a lot to sensitize pupils on the need for conservation, especially of wildlife and danger of illegal hunting, through the establishment of a conservation club in the school.	No response
Mrs. R. Ediagbonya, Okomu Primary School	She used the opportunity to plead with the OOPC to provide the school with a vehicle to visit ONP for students to appreciate the real need for conservation.	Noted

Mr. Omogbon Osayaba, Chairman, Leaves Harvesters Association	Mr. Omogbon assured OOPC of their readiness at all times to ensure strict compliance with the terms of agreement between the OOPC and the Leaves Harvesters. He however, called on the OOPC to ensure strict law enforcement as there were indications that non-registered leaves harvesters were beginning to operate within the estate.	Noted
Mr. Onyesom O. Kenedy, Chairman OOPC Staff Union	He noted the readiness of all the members of the union to be law-abiding, and ensure that all the identified HCVs are protected. He suggested the needs for OOPC to continue engaging the communities to ensure that both parties operate on the same page regarding protections of the HCVs.	Noted
Mr. Samuel Umeabi, Sam O. Moltagic, Nig.	Mr. Umeabi indicated that OOPC and ONP should create awareness in all the surrounding communities to partner with them in helping the rangers and OOPC security staff in monitoring wildlife species. He suggested that if possible, monitoring committee should be set up for that purpose.	No response

5.7.1 Community Consultations

Results from the baseline socio-economic survey carried out by FDS Ltd. have been complemented with broad community-level consultations carried out during the fieldwork. Public meetings were held with about sixteen (16) communities in attendance, and involving a cross-section of all stakeholder groups including the Odionwere and his elders, women, farmers, fishermen, hunters and other identifiable groups (Plate 3). Several comments were made about OOPC, which indicated generally positive impacts on the affected communities (Table 8). It was viewed by the communities that the main estate operation represents one of the most effective avenues for poverty alleviation in recent time.



Plate 3: Cross-section of participants at the community consultation for the HCVs assessment

Table 8: Outcome of the community stakeholders' consultations held 29 November 2017

Community/ stakeholder	No. of persons	Discussion on HCVs, concerns, comments and questions	Assessors remarks
Udo	04	Community expressed satisfaction with the activities of the OOPC so far, having benefitted immensely from a number of social intervention projects including one block of open stall; borehole and a powerhouse with generating set.	Noted
Owan	02	Considering the fact that most of the community members are farmers, and the need to protect/ and or enhance the HCVs, and the possible increase in the population of fauna, fears were expressed on fauna population explosion. The community gave assurance of reporting (whistle-blowing) the offenders, poachers or illegal actors in connection with the identified HCVs, but expects compensation for whistle blowers.	Explained that there should be a clear policy on managing human-wildlife conflict arising from protecting the HCVs. Tried to explain that the whistle-blowing policy should not be seen as opportunity for blackmails, that any related cases of illegality or contravention should be well-verified before reported.
Ubgogui	02	The community wonders if the company intended to dispossess them of their ancestral land and natural resources by telling them to preserve or protect the identified biological HCVs, and what happens should the populations of animals increase in the future, knowing fully-well that these animals could descend on cultivated crops?	The assessor explained that OOPC never intended to dispossess them of their God-given resources, but rather encouraging them to encourage and enhance the existence of the HCV for the benefit of the future generations. Moreover, the reserve, which houses the OOPC was hitherto degraded, and the company tried to salvage the situation by preserving the relics of riparian forest and wetlands.
Opuama	03	The community was grateful to OOPC for providing the students from the community with annual bursaries for higher educations. Other amenities provided by the company include maintenance of communal roads and building of boreholes.	Were impressed that such good relationships already existed between the community and the company.
Gbole-uba	02	The community was grateful to the OOPC for training and re-training of members, provision of bursaries to students, who are indigenes at higher institutions of learning as well as sponsoring skill acquisition training to the youth.	Were impressed that such good relationships already existed between the community and the company.
Oke	05	The community, in unison expressed readiness to expose any illegal actors, who could pose threat to the identified HCVs through hunting or logging activities	Noted
Iguiye	03	The community indicated that non-hunting policy in the area could be difficult to comply with, but now that they are informed about the development as well as the benefits of protecting HCVs, members will surely comply	Noted with appreciation
Ekpan	03	Generally happy with Okomu Oil Palm Company with bursary and skill acquisition programmes, and pray the good relationship continues.	Noted

Uhiere	05	The community was visibly glad with OOPC for providing some social amenities and gave assurances that all members of the community will be educated to ensure protection of the identifies HCVs.	Encouraged the community to ensure wider dissemination of the available information concerning the HCVs for their protection and enhancement.
Ofunama	03	Expressed appreciation to OOPC for providing bursaries and providing sponsorships for a number of skill acquisition trainings to the youth of the community	The assessors verified whether such actions by the company are genuine, and the community confirmed with evidences
Madagbayo	02	The community reacted that the operations of OOPC should continue unhindered because of the numerous social issues that have already been handled by the company, and expressed optimism that there were more benefits to be derived by the surrounding communities with much needed cooperation.	Were impressed with the extent the company had gone in bridging the social infrastructural gaps between the government and the host communities as well as the levels of relationships that it has established with the communities.
Agbanikaka	02	Very happy with the company for extending social benefits to the community, and expressed that the community had no grievances with the company or its operations	Noted.

5.7.2. Participatory Mapping

Where there was indication that local communities use resources from the assessment area, participatory mapping was done to determine the nature and distribution of utilized resources. The approach was to present a map of the area and ask participants at the community meetings to indicate the location of the particular resource mentioned. Although only one Shrine - Life Tree (06°24'24.9"N; 005°15'37.6"E) is situated within the assessment area, Okomu River was also identified as a resource used by some of the boundary communities, especially those closer to Coconut and Agbede Camps (Figure 10).

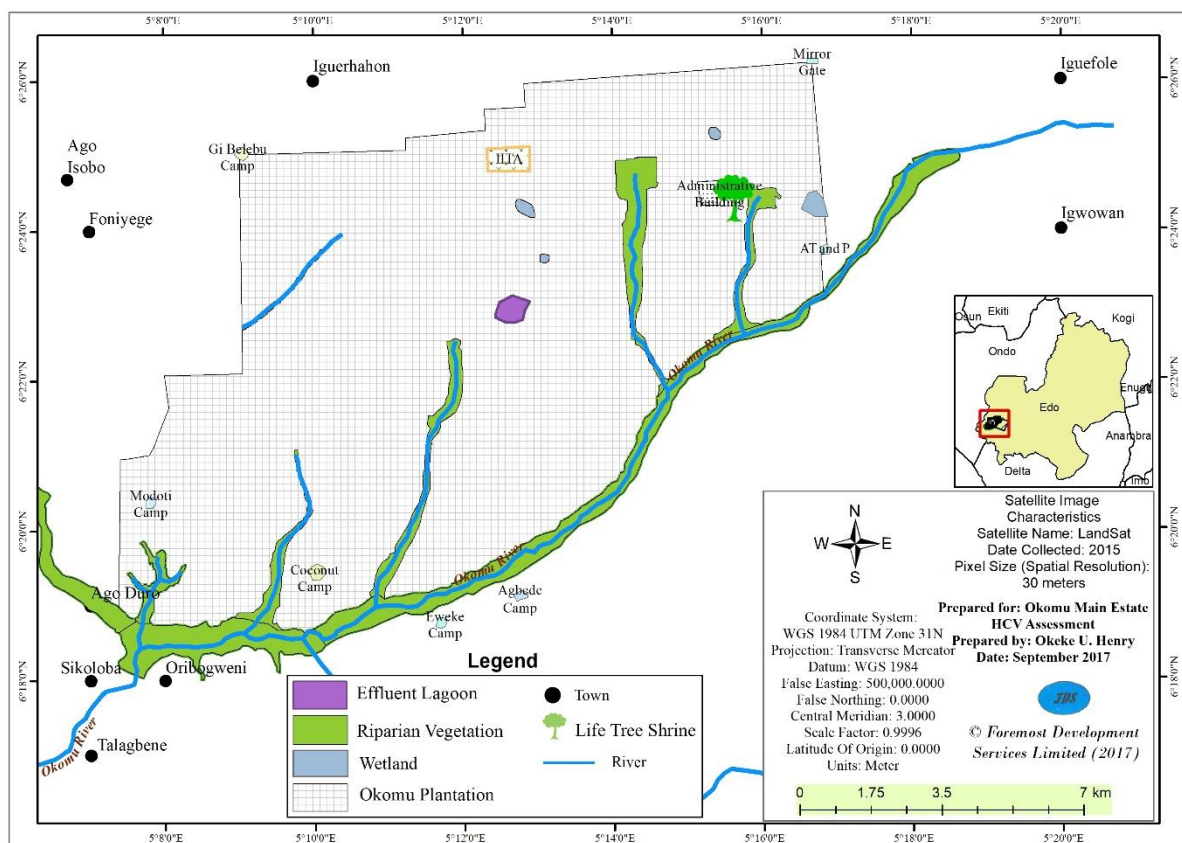


Figure 10: Participatory map showing locations of resources of values to local communities

6.0 HCV MANAGEMENT AND MONITORING


This section includes assessment of the actual and potential threats to HCVs identified in the assessment area, management recommendations to ensure the maintenance or enhancement of HCVs present in the area. The section also provides monitoring recommendations, which OOPC is expected to adopt for evaluating the effectiveness of the HCV management recommendations over time.

6.1 Threat Assessment

Threats to identified HCVs have been assessed through observations in the field and consultations with stakeholders including communities with due consideration for the extent of area, the severity and duration of the impact on the HCV in estimating the importance of the threat. For external threats, an attempt is made to identify indirect causes where feasible. Details of threats or potential threats, where present, are presented in Table 9.

Table 9: Threats to the identified HCVs in the assessment area

HCV	Brief description of value present in assessment area	Main threats/Potential Threat
1	Species diversity: Presence of 13 important floral, 4 faunal and 3 avifaunal species listed on	Hunting/illegal logging Field verifications and confirmation from community consultations revealed indicators of some threats in form of internal wildlife hunting through trapping and firearm, as

<p>IUCN Red List of Threatened species.</p>	<p>exemplified below. A spent cartridge and chain of traps were spotted in two of the riparian forests behind the Labour line and Oil Mill. There were no logging signs observed at the moment, but there are possibility in the future considering the richness of the riparian/secondary forests</p> 
<p>3 Ecosystems and habitats: Riparian forests and wetlands in the estate with impressive populations of economically important species at national and regional levels.</p>	<p>Plate 2: Hunting signs as threat to HCV 1</p> <p>There appears to be no threat, whatsoever to the riparian forests or wetlands at present, and there is no plan for future conversion of the ecosystems. However, the flooding (sludge) caused by the discharge of mill effluent appears to be toxic. This can be a potential threat to the survival of other proximal floral and faunal species,</p>
<p>4 Ecosystem services: Critical water catchment areas required to maintain continuous flow of, and enhance quality of water in the area. Riparian vegetation protecting different water bodies within the estate.</p>	<p>Although there appears to be no threat or potential threats to HCV 4, as there were no plans to reduce the extent, or to destroy any of the riparian forests or wetlands in the assessment area. However, threat may be in the form of pollution from agrochemical uses.</p>
<p>6 Areas critical to local communities' traditional cultural identity: The shrine (Life Tree) at Labour Line Quarters in front of Odionwere's house.</p>	<p>At present, there appears to be no threat to the shrine as it is well contained within a block-fenced wall. It is rather unusual for a tree to be fenced and this in itself serves to communicate that this is an area of restricted access. The OOPC has already recognized this HCV, and ensures its proper management, as confirmed by the Odionwere, the Traditional Authority.</p>

6.2 HCV Management and Monitoring Recommendations

Table 10 outlined recommendations for managing the identified high conservation values in the main estate concession.

Table 10: HCV management recommendations

HCV	Threat/potential threat	Management recommendations	Monitoring recommendations
1	Hunting through trapping and firearm.	Strict enforcement of hunting ban in all the riparian and wetlands. MoU with ONP for joint monitoring of important (IUCN red-listed) faunal species within the forest.	Regular monitoring and occasional patrols of riparian forests and wetlands. No application of agrochemicals within the forest
3	Flooding of palm oil mill effluent	Detoxification of mill effluent before disposal. Phytochemical test to ascertain the toxic component of the wastes. Proper and effective containment of the effluent lagoon.	Regular monitoring of the effluent lagoon to ascertain the condition of the site components as well as impacts on flora and fauna, Regular monitoring of the swamp forest, no application of agrochemicals within swamp forest buffer zones. Regular inspection and maintenance of the containment of the effluent lagoon.
4	Pollution from agrochemicals.	All riparian forest areas must be excluded from conversion or development activities. Avoid application of agrochemicals in riparian forests, and within the vicinity of wetlands.	Yearly review of the effectiveness of standard operating procedures (SOPs), Regular sampling from rivers for testing, regular monitoring of riparian vegetation
6	Clearing of sacred and shrine sites (Life Tree), or extraction of its parts by uninformed persons.	OOPC to prepare HCV management plan that accommodate management of the Shrine (Life Tree) in the assessment area. Okomu to allow the people of Udo unconditional access to their shrine and sacred sites. A written agreement clearly establishing access routes and any related issues should be created and signed by the Okomu and the relevant communities.	Effective HCV 6 monitoring system in collaboration with the local communities/traditional authorities.

7.0 SYNTHESIS

7.1 HCV Management Areas

HCV 1: The riparian forests, especially those behind the Oil Mill and Labour Line Quarters should be left undeveloped to protect and enhance the population of important and IUCN Red Listed species they contain.

HCV 3 & 4: The riparian forests serving as the buffer between the developed oil palm and rubber plantations and water bodies should be maintained in their present conditions and extent to continue enhancing the water quality. All farming activities, at all times, should be prohibited

in the wetlands. The riparian forests should be considered as contiguous zones to the ONP for which OOPC and ONP should have joint responsibility for management and monitoring

HCV 6: The existing fence wall around the ‘Life Tree’ defines the area to be maintained for this HCV (Figure 11).

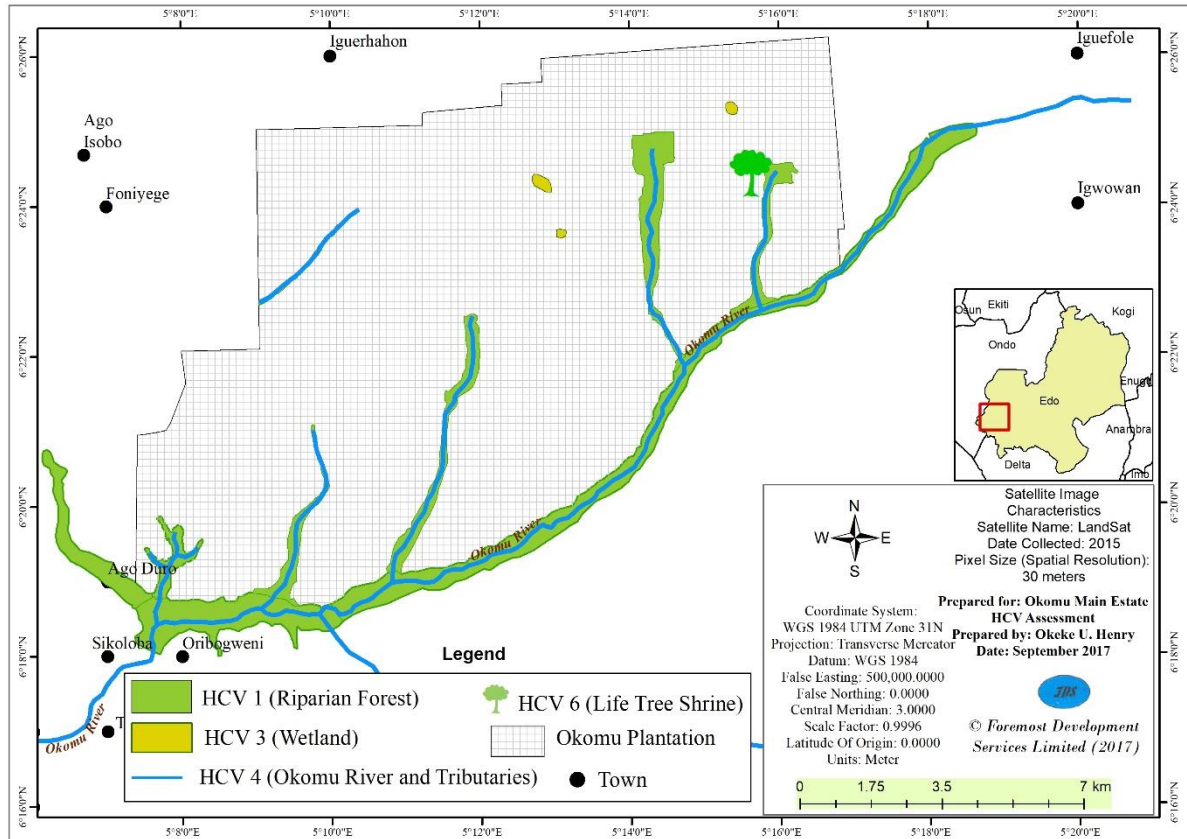


Figure 11: HCVs Management map

7.2 Cross-cutting Management Recommendations

7.2.1 Management Plan for HCV management and monitoring

It is extremely important and considered best practice for general plantation operations to be ‘check-listed’ for easy reference by operational staff and field workers. Similarly, HCV management and monitoring protocols should be developed in the form of checklists for active use by relevant field workers, after they have received adequate training. The staff members (residing within the estate), among whom are perceived to be responsible for threats, especially of hunting, need re-orientation about the decision of OOPC to manage and protect the biodiversity in riparian forests and wetlands, where HCVs have been identified. A sanction may be imposed on the offenders or defaulters according to OOPC’s code of conducts.

7.2.2 Training and capacity building

Adequate capacity is required to ensure effective management and monitoring of HCV management areas with a view to maintaining and/or enhancing all the HCVs identified. The capacity to accurately capture geospatial data for subsequent analysis is crucially important. The company’s survey team demonstrated commendable knowledge of the assessment area

and related features, but their capacity to use the simple survey tools and GPS needs to be improved through focused and specific trainings.

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9.0 ANNEXES

Annex 1: CVs of the Assessment Team Members

F. A. Afolabi

Current Position:

F.A. Afolabi is the Managing Consultant/Managing Director of Foremost Development Services Limited. He is in charge of overall project execution and delivery. He has been an active player in agriculture, rural development and environmental management in Nigeria. He coordinated the pre-Intervention study for the rehabilitation of oil palm and cocoa nationwide, sponsored by the defunct PTF in 1998-99. He also participated actively in the formulation and studies for the backward integration of big corporate entities including UAC, CFAO, Flour Mills of Nigeria, Nigerian Breweries and Guinness in the late 1980s.

Qualification:

F.A Afolabi holds a M.Sc. Degree in Development Planning from the University of East Anglia, UK; B.Sc. in Agriculture from the University of Ibadan, Nigeria, 1983; PhD programme (in view) in Forest Resources Management, University of Ibadan, Nigeria; Certificate in HCV Assessor Training Course provided by Proforest, UK in 2015; Certificate in RSPO Lead Auditor Course by Proforest, Ghana in 2015; RSPO Producer Course also by Proforest UK in Ghana.

Roundtable on Sustainable Palm Oil (RSPO):

He is the Facilitator, RSPO National Interpretation in Nigeria. He established the mechanism for the sensitization and mobilization of plantation owners for subscribing to the principles and criteria of RSPO in Nigeria. He also put together the National Interpretation working group or task force and the Nigeria Interpretation (NI) of RSPO was just approved in July 2017 by RSPO secretariat.

Expertise:

Afolabi has over 30 years of experience in agricultural and development projects in Nigeria. His expertise includes project identification, design and planning. He is responsible for project planning, development, execution, and the overall management of Foremost Development Services Limited. As the Managing Consultant and CEO of Foremost Development Services Limited, he has been an active player in agriculture, rural development and environmental management in Nigeria. He started his career in the Agricultural Department of Knight Frank & Rutley in 1984 as Agricultural Consultant and participated in the study and execution of notable agricultural projects for corporate organization, government and foreign agencies. His career as a development planner has seen his hands in notable development projects for government, corporate establishments, international organizations and NGOs.

Membership:

He is a member of the Nigerian Conservation Foundation (NCF), Nigerian Environmental Society (NES) and Forestry Association of Nigeria (FAN).

Dr Adesoji A. Adeyemi

Current position:

Dr Adeyemi is a Lecturer and Consultant in Forest Inventory and Biometrics/Remote Sensing at the Department of Forest Resources Management, University of Ilorin, Nigeria. He has multi-faceted background in Forest Resources Management, biodiversity assessment and conservation, floral and faunal population analyses, species distribution modelling, statistical and landscape ecology.

Qualifications:

He holds a PhD in Forest Resources Management, MSc in Forest Biometrics and Remote Sensing and BSc in Forest Resources Management from the University of Ibadan, Nigeria.

In addition, Dr Adeyemi has Diploma in Remote Sensing and GIS Applications for Natural Resources Management from ICRISAT in 2012; Certificate in Biodiversity Assessment for Conservation, George-August University, Gottingen, Germany in 2011; Certificate in Quantitative Landscape Ecology and Environmental Sustainability, University of KwaZulu-Natal, Durban South Africa in 2012; Certificate in Advanced Distance Sampling with Spatial Modelling, University of St Andrews, Scotland, UK in 2015; Certificate in HCV Assessor Training Course provided by Proforest, UK in 2015; Certificate in Google Earth Engine Applications, Google Inc., Google Headquarters, Mountain View, California, USA in 2017; Certificate in Geomatics, University of Yaoundé I, Yaoundé, Cameroon in 2017.

HCV: He has participated in previous HCV assessments with Proforest at Presco Plc in 2016.

Fieldwork: Over 9 years of experience in fieldwork within and outside tropical rainforests in about 5 African countries since 2009.

Membership:

He is a member of African Forest Forum (AFF); Society for Conservation Biology (SCB), Tropical Biology Association (TBA) and the Forestry Association of Nigeria (FAN).

Ahmeed A. Olanigan

Current Position:

Mr. Olanigan is a Senior Consultant at Foremost Development Services Limited.

Qualification:

He holds an M.Phil. in Environmental Management and Protection, 1999 and B.Sc. in Environmental Management and Toxicology, 2010 from the University of Agriculture Abeokuta, Nigeria; Certificate in General Health, Safety and Environment (General HSE), in 2000; Certificate in Health, Safety and Environmental Development in 2000, Nigeria Institute of Safety Professional (NISPP), Nigeria; Certificate in Occupational Health and Safety,

Chattered Institute of Environmental Health (CIEH), UK in 2004; Certificate in HCV Assessor Training Course provided by Proforest, UK in 2015.

Expertise:

He started his carrier with MAK MERA ENERGY SERVICES Ltd as an Environmental Scientist and Safety Officer in the year 2000 and participated in the execution of many environmental studies in Shell Petroleum Development Company Ltd, Warri and Port-Harcourt. He later joined Foremost Development Services in 2002 as an environmental Consultant. He is responsible for project coordination, environmental and social/socio economic studies and environmental monitoring among others.

Dr Caroline O. Akachuku

Current position:

Head of Department of Forestry and Environmental Management,
Michael Okpara University of Agriculture Umudike, Umuahia, Nigeria

Qualifications:

PhD, Forestry, University of Science and Technology, (UST) Rivers State, Port Harcourt, Nigeria in 2002, MSc Agronomy, University of Ibadan, Nigeria in 1991 and BSc Forest Resources Management, University of Ibadan, Nigeria in 1986

Expertise:

Dr Akachuku has participated in a number of in fieldwork and research in Forest Ecology, Biodiversity and Environmental Conservation as well as flora inventory, both within and outside Nigeria, in the last two decades.

Membership:

Member of Forestry Association of Nigeria (FAN), International Society for Tropical Forestry (ISTF), Nigeria Society for Biological Conservation (NSBC), the Nigeria Field Society (NFS), Nigeria Conservation Foundation (NCF) and Standard Organization of Nigeria (SON) among many others.

Dr Daniel I. Edet

Current position:

Dr Edet is the Head of Department, and Senior Lecturer/Wildlife Conservationist at the Department of Forestry and Wildlife Technology, Federal University of Technology, Owerri, Nigeria.

Qualifications:

Dr Edet holds a PhD Wildlife Management, University of Ibadan, Nigeria 2011, MSc Wildlife Management, University of Ibadan, Nigeria in 2004 and BSc in Wildlife and Range Management from University of Agriculture Makurdi, Nigeria in 1997.

Expertise:

Dr Edet has more than fifteen years of teaching and research experience at the university level and background with extensive experience in biodiversity assessments since 2004. Recent areas of research include Biodiversity Monitoring in Oil Polluted Sites of the Niger Delta

Region of Nigeria, Protected Area Management, Human Wildlife Conflict and Primate Conservation.

Membership:

Dr Edet is member of Forestry Association of Nigeria (FAN), Wildlife Management Society of Nigeria (WIMSON), Nigerian Environmental Study and Action Team (NEST) and Wildlife Conservation Society (WCS).

Ebenezer T. Adebayo

Current position:

He is an Assistant Lecturer at the Department of Fisheries and Aquaculture Technology, Federal University of Technology Owerri, Nigeria

Qualifications:

Adebayo recently finalized his PhD in Fisheries and Hydrology at University of Ibadan, Nigeria in 2017, and awaiting last approval from the university senate.

MSc Zoology, Hydrobiology and Fisheries, University of Ibadan, Nigeria 2009

BSc Zoology; Unilorin, Nigeria 2005

Expertise:

Over 8 years of experience in fish taxonomy, fish biology, water quality and resources management, aquaculture management, and aquatic toxicology.

Membership:

He is a professional member of the Fisheries Society of Nigeria (FISON), Society for Environmental Toxicology and Pollution Mitigation (SETPOM), and Catfish Association of Nigeria (CFAN).

Francis A. Egwumah

Current position:

Egwumah is a doctoral research fellow in Ornithology at University of Agriculture Makurdi, Nigeria.

Qualifications:

He holds a Master's Degree in Wildlife and Range Management specializing in Ornithology; a BSc in Forestry, Wildlife and Range Management from University of Agriculture, Makurdi in 2008.

Expertise:

He has over 6 years of experience in avifaunal studies in several land-use types within Nigeria.

Membership:

He is a member of Wildlife Society of Nigeria (WSN); Forestry Association of Nigeria (FAN) and Nigeria Tropical Biology Association (NTBA).

Henry U. Okeke

Current position:

Okeke is a Scientific Officer with the National Space Research and Development Agency (NASRDA) at Ile-Ife in Osun State, Nigeria since 2011.

Qualification:

He holds MSc in Remote Sensing and GIS from Obafemi Awolowo University, Ile-Ife, Nigeria in 2013, and BSc in Geography and Regional Planning from University of Benin in 2006. He has equally attended other certificate courses in recent times, some of which include a Postgraduate Diploma in Geo-information Production and Management at the Regional Center for Training in Aerospace Surveys (RECTAS), Ile-Ife, Nigeria and a diploma in Computer Appreciation and Space Technology at National Centre for Remote Sensing Consultancy Services.

Expertise:

He worked briefly with OKTEX Engineering Service in Port Harcourt, River State, as a remote sensing and GIS personnel in 2010. Henry has over 6 years of experience in land-use/land cover characterization, natural resource inventory, geo-spatial modeling, suitability analysis and participatory mapping using GIS in many parts of Nigeria. Okeke participated in previous assignment with OOPC at Extension II communities in 2016 engaging in participatory mapping. He has participated in several other fieldworks bothering on land suitability evaluation and assessment for agricultural uses in Nigeria.

Ukam U. Ibe

Current position:

He is a Senior Research Officer (Botanical Survey and Inventory), Cross River National Park, Cross River State, Nigeria

Qualifications:

Diploma in Forestry, 2008

Expertise:

Ibehas over 10 years of experience in forest inventory, botanical rambling and biodiversity assessment, working with the National Park. For this assessment, Ukam was part of the floral sub-team, responsible for conducting an inventory and botanical survey in the assessment area.

Annex 2: Flora survey data

Tree species identified in the assessment area and their densities per hectare

SN	Species	Family	Mean Height (m)	Mean Dbh (cm)	N/ha
1	<i>Azelia africana</i>	<i>Leguminosae</i>	21.36	43.93	9
2	<i>Albizia glaberrima</i>	<i>Leguminosae</i>	12.92	25.99	3
3	<i>Albizia zygia</i>	<i>Leguminosae</i>	15.20	25.20	3
4	<i>Allanblackia floribunda</i>	<i>Clusiaceae</i>	14.43	24.36	4
5	<i>Alstonia boonei</i>	<i>Apocynaceae</i>	16.66	42.21	15
6	<i>Alstonia congensis</i>	<i>Apocynaceae</i>	8.33	15.54	5
7	<i>Ancistrocladus heyneanus</i>	<i>Ancistrocladaceae</i>	22.00	64.27	1
8	<i>Anogeissus leiocarpa</i>	<i>Combretaceae</i>	23.75	42.42	9
9	<i>Antrocaryon micrasta</i>	<i>Anacardiaceae</i>	17.00	57.59	1
10	<i>Baphia maxima</i>	<i>Fabaceae</i>	14.33	29.54	14
11	<i>Baphia nigerica</i>	<i>Fabaceae</i>	23.00	42.63	1
12	<i>Baphia nitida</i>	<i>Fabaceae</i>	11.32	22.73	11
13	<i>Barteria nigritana</i>	<i>Passifloraceae</i>	10.00	14.32	1
14	<i>Bertiera recemosa</i>	<i>Rubiaceae</i>	11.45	15.61	4
15	<i>Bombax buonopozense</i>	<i>Bombacaceae</i>	26.00	10.50	1
16	<i>Brachystegia eurycoma</i>	<i>Leguminosae</i>	16.67	75.51	2
17	<i>Brachystegia kennedyi</i>	<i>Leguminosae</i>	19.36	59.72	4
18	<i>Brachystegia nigerica</i>	<i>Leguminosae</i>	10.33	20.79	2
19	<i>Bridelia ferruginea</i>	<i>Leguminosae</i>	9.50	15.43	1
20	<i>Bridelia micrantha</i>	<i>Leguminosae</i>	13.58	29.56	40
21	<i>Carpolobia lutea</i>	<i>Polygalaceae</i>	6.00	14.64	1
22	<i>Ceiba pentandra</i>	<i>Bombacaceae</i>	20.00	95.13	2
23	<i>Chrysophyllum albidum</i>	<i>Sapotaceae</i>	19.00	152.72	1
24	<i>Cola nigerica</i>	<i>Sterculiaceae</i>	15.75	32.13	2
25	<i>Corynanthe pachyceras</i>	<i>Rubiaceae</i>	12.42	30.42	13
26	<i>Coula edulis</i>	<i>Olacaceae</i>	10.00	28.48	2
27	<i>Crossopteryx febrifuga</i>	<i>Rubiaceae</i>	18.00	17.82	1
28	<i>Cytogonone argentea</i>	<i>Euphorbiaceae</i>	14.43	41.20	7
29	<i>Dacryodes klaineana</i>	<i>Burseraceae</i>	18.00	62.68	1
30	<i>Daniela oblonga</i>	<i>Fabaceae</i>	10.00	31.34	1
31	<i>Dialium guineense</i>	<i>Leguminosae</i>	17.64	28.52	6
32	<i>Dialium pachyphyllum</i>	<i>Leguminosae</i>	9.50	24.92	2
33	<i>Diospyros crossifera</i>	<i>Ebenaceae</i>	20.00	40.88	1
34	<i>Diospyros crysifolia</i>	<i>Ebenaceae</i>	10.00	13.36	1
35	<i>Diospyros melocarpa</i>	<i>Ebenaceae</i>	18.00	23.70	1
36	<i>Diospyros mespiliformis</i>	<i>Ebenaceae</i>	17.70	63.32	3
37	<i>Diospyros nigerica</i>	<i>Ebenaceae</i>	19.13	48.91	16
38	<i>Diospyros senegalensis</i>	<i>Ebenaceae</i>	22.88	57.67	2
39	<i>Diospyros tricolor</i>	<i>Ebenaceae</i>	26.00	38.18	1

40	<i>Diospyros zenkeri</i>	<i>Ebenaceae</i>	20.24	39.05	14
41	<i>Distemonanthus benthamianus</i>	<i>Leguminosae</i>	35.00	127.27	1
42	<i>Halea ciliata</i>	<i>Rubiaceae</i>	14.95	15.48	4
43	<i>Enantia chloranta</i>	<i>Annonaceae</i>	12.92	19.86	3
44	<i>Erythroxyllum africana</i>	<i>Erythroxylaceae</i>	10.50	28.56	2
45	<i>Ficus abutilifolia</i>	<i>Moraceae</i>	7.00	13.36	1
46	<i>Ficus anomani</i>	<i>Moraceae</i>	24.00	53.45	1
47	<i>Ficus asperifolia</i>	<i>Moraceae</i>	18.50	41.52	1
48	<i>Ficus exasperata</i>	<i>Moraceae</i>	16.40	55.36	3
49	<i>Ficus mucuso</i>	<i>Moraceae</i>	8.00	14.00	1
50	<i>Ficus ovata</i>	<i>Moraceae</i>	20.50	41.62	5
51	<i>Ficus populifolia</i>	<i>Moraceae</i>	13.00	16.50	1
52	<i>Funtumia elastica</i>	<i>Apocynaceae</i>	12.15	19.12	7
53	<i>Hunteria umbellata</i>	<i>Apocynaceae</i>	10.04	22.19	12
54	<i>Hyloedendron gabunense</i>	<i>Fabaceae</i>	16.75	32.69	1
55	<i>Irvingia gabonensis</i>	<i>Irvingiaceae</i>	18.00	38.12	3
56	<i>Irvingia wombulu</i>	<i>Irvingiaceae</i>	22.21	49.01	9
57	<i>Khaya ivorensis</i>	<i>Meliaceae</i>	22.00	52.82	1
58	<i>Klainedoxa gabonensis</i>	<i>Irvingiaceae</i>	30.25	153.52	2
59	<i>Lannea schimperii</i>	<i>Anacardiaceae</i>	12.50	41.68	1
60	<i>Lophira alata</i>	<i>Ochnaceae</i>	24.36	90.56	7
61	<i>Lophira lanceolata</i>	<i>Ochnaceae</i>	17.94	27.40	5
62	<i>Lovoa trichilioides</i>	<i>Meliaceae</i>	25.45	46.28	5
63	<i>Monodora crysipata</i>	<i>Annonaceae</i>	18.47	35.04	25
64	<i>Monodora myristica</i>	<i>Annonaceae</i>	23.00	38.50	1
65	<i>Musanga cecropioides</i>	<i>Urticaceae</i>	11.20	27.16	14
66	<i>Omphalocarpum procerum</i>	<i>Sapotaceae</i>	17.00	41.04	1
67	<i>Parkia bicolor</i>	<i>Fabaceae</i>	22.12	57.55	17
68	<i>Parkia clappertoniana</i>	<i>Fabaceae</i>	18.00	25.29	1
69	<i>Pentaclethra macrophylla</i>	<i>Leguminosae</i>	10.83	25.64	2
70	<i>Piliostigma reticulatum</i>	<i>Leguminosae</i>	16.00	21.32	1
71	<i>Piliostigma thonningii</i>	<i>Leguminosae</i>	11.75	19.97	2
72	<i>Piptadeniastrum africanum</i>	<i>Leguminosae</i>	24.85	93.27	7
73	<i>Porterandia cladantha</i>	<i>Rubiaceae</i>	24.00	57.27	1
74	<i>Prosopis africana</i>	<i>Leguminosae</i>	18.00	32.45	1
75	<i>Pseudocedrella kotschyii</i>	<i>Meliaceae</i>	23.00	87.50	1
76	<i>Pterocarpus erinaceus</i>	<i>Leguminosae</i>	13.00	19.73	1
78	<i>Pterocarpus indicus</i>	<i>Leguminosae</i>	15.83	53.03	2
79	<i>Pterocarpus osun</i>	<i>Leguminosae</i>	14.00	27.60	5
80	<i>Pycnanthus angolensis</i>	<i>Myristicaceae</i>	21.38	52.63	7
81	<i>Rauvolfia macrophylla</i>	<i>Apocynaceae</i>	14.13	30.59	6
82	<i>Rauvolfia vomitoria</i>	<i>Apocynaceae</i>	18.00	17.18	1
83	<i>Ricinodendron heudelotii</i>	<i>Euphorbiaceae</i>	9.00	13.68	1
84	<i>Staudtia stipitata</i>	<i>Myristicaceae</i>	22.80	40.51	8
85	<i>Strombosia postulata</i>	<i>Olacaceae</i>	8.00	16.54	2
86	<i>Tamarindus indica</i>	<i>Combretaceae</i>	34.00	169.58	1
87	<i>Terminalia ivorensis</i>	<i>Combretaceae</i>	17.10	31.06	8
88	<i>Terminalia kennedyi</i>	<i>Combretaceae</i>	12.00	14.32	1
89	<i>Terminalia superba</i>	<i>Combretaceae</i>	19.35	43.34	12
90	<i>Tetrapleura tetraptera</i>	<i>Leguminosae</i>	32.00	118.36	1

91	<i>Uapaca togolensis</i>	<i>Phyllanthaceae</i>	14.19	25.97	4
92	<i>Vernonia anthelmintica</i>	<i>Compositae</i>	13.50	14.00	1
93	<i>Vernonia frondosa</i>	<i>Compositae</i>	15.40	29.56	3
94	<i>Vitex doniana</i>	<i>Verbenaceae</i>	15.25	40.17	2
95	<i>Xylopia quantasii</i>	<i>Annonaceae</i>	21.50	29.35	1
96	<i>Zanthoxylum zanthoxyloides</i>	<i>Rutaceae</i>	14.89	31.67	9
	Total				404
1	Wetland				
2	<i>Allanblackia floribunda</i>	<i>Clusiaceae</i>	17	31.18	1
3	<i>Alstonia boonei</i>	<i>Apocynaceae</i>	19	106.59	2
4	<i>Bombax constatum</i>	<i>Bombacaceae</i>	24	53.13	1
5	<i>Ceiba pentandra</i>	<i>Bombacaceae</i>	22	98.63	1
6	<i>Diospyros senegalensis</i>	<i>Ebenaceae</i>	20	36.59	1
7	<i>Hallea ciliata</i>	<i>Rubiaceae</i>	14	48.68	1
8	<i>Monodora crysipata</i>	<i>Annonaceae</i>	12	16.86	1
9	<i>Nauclea latifolia</i>	<i>Rubiaceae</i>	17.75	137.45	2
10	<i>Ricinidendron heudelotii</i>	<i>Euphorbiaceae</i>	11	23.86	1
11	<i>Terminalia catappa</i>	<i>Combretaceae</i>	15	44.54	1
12	<i>Terminalia ivorensis</i>	<i>Combretaceae</i>	24.5	84.00	1
13	<i>Terminalia superba</i>	<i>Combretaceae</i>	23	108.81	2
	Total				11

Trees species in the assessment area and their IUCN conservation statuses

SN	Name	Family	Authority	IUCN Status
1	<i>Afzelia africana</i>	<i>Leguminosae</i>	Smith	VU
2	<i>Albizia glaberrima</i>	<i>Leguminosae</i>	Schumach	NA
3	<i>Albizia zygia</i>	<i>Fabaceae</i>	(DC.) J. F. Macbr.	NA
4	<i>Allanblackia floribunda</i>	<i>Clusiaceae</i>	Oliv.	VU
5	<i>Alstonia boonei</i>	<i>Apocynaceae</i>	De Wild.	NA
6	<i>Alstonia congensis</i>	<i>Apocynaceae</i>	Engl.	NA
7	<i>Ancistrocladus heyneanus</i>	<i>Ancistrocladaceae</i>	Wall. ex J. Graham	NA
8	<i>Anogeissus leiocarpa</i>	<i>Combretaceae</i>	(DC.) Guill. & Perr.	NA
9	<i>Antrocaryon micraster</i>	<i>Anacardiaceae</i>	A.Chev & Guillaumin	VU
10	<i>Baphia maxima</i>	<i>Fabaceae</i>	Baker	NA
11	<i>Baphia nigerica</i>	<i>Fabaceae</i>	Lodd.	NA
12	<i>Baphia nitida</i>	<i>Fabaceae</i>	Lodd.	LC
13	<i>Barteria nigritana</i>	<i>Passifloraceae</i>	Hook. f.	NA
14	<i>Bertiera racemosa</i>	<i>Rubiaceae</i>	(G.Don) K.Schum	NA
15	<i>Bombax buonopozense</i>	<i>Bombacaceae</i>	P.Beauv.	NA
16	<i>Bombax constatum</i>	<i>Bombacaceae</i>	Pellegr. & Vuill	NA
17	<i>Brachystegia eurycoma</i>	<i>Leguminosae</i>	Harms.	NA
18	<i>Brachystegia kennedyi</i>	<i>Leguminosae</i>	Hoyle	VU
19	<i>Brachystegia nigerica</i>	<i>Leguminosae</i>	Hoyle & A.P.D.Jones	VU
20	<i>Bridelia ferruginea</i>	<i>Leguminosae</i>	Benth.	NA
21	<i>Bridelia micrantha</i>	<i>Leguminosae</i>	Hochst	NA
22	<i>Carpolobia lutea</i>	<i>Polygalaceae</i>	G.Don	NA
23	<i>Ceiba pentandra</i>	<i>Bombacaceae</i>	L.	NA
24	<i>Chrysophyllum albidum</i>	<i>Sapotaceae</i>	G.Don	NA
25	<i>Cola nigerica</i>	<i>Sterculiaceae</i>	Brenan & Keay	CE
26	<i>Corynathe pachyceras</i>	<i>Rubiaceae</i>	K.Schum	NA
27	<i>Coula edulis</i>	<i>Olacaceae</i>	Baill	NA
28	<i>Crossopteryx febrifuga</i>	<i>Rubiaceae</i>	Afzel. ex G.Don	NA
29	<i>Cyrtogonone argentea</i>	<i>Euphorbiaceae</i>	Pax	NA
30	<i>Dacryodes klaineana</i>	<i>Burseraceae</i>	Pierre	NA
31	<i>Daniela oblonga</i>	<i>Fabaceae</i>	Oliver	NA
32	<i>Dialium guineense</i>	<i>Leguminosae</i>	Willd	NA
33	<i>Dialium pachyphyllum</i>	<i>Leguminosae</i>	Harms	NA
34	<i>Diospyros crossifera</i>	<i>Ebenaceae</i>	Hiern	NA
35	<i>Diospyros crysifolia</i>	<i>Ebenaceae</i>	Roxb	NA
36	<i>Diospyros melocarpa</i>	<i>Ebenaceae</i>	F.White	NA
37	<i>Diospyros mespiliformis</i>	<i>Ebenaceae</i>	Hochst	NA
38	<i>Diospyros nigerica</i>	<i>Ebenaceae</i>	F.White	NA
39	<i>Diospyros senegalensis</i>	<i>Ebenaceae</i>	Perrier ex A.D.C.	NA
40	<i>Diospyros tricolor</i>	<i>Ebenaceae</i>	Schum. & Thonn.	NA

41	<i>Diospyros zenkeri</i>	<i>Ebenaceae</i>	(Gurke) F.White	NA
42	<i>Distemonanthus benthamianus</i>	<i>Leguminosae</i>	Baill	NA
43	<i>Hallea ciliata</i>	<i>Rubiaceae</i>	Pellegr.) J.-F. Leroy	NA
44	<i>Enantia chlorantha</i>	<i>Annonaceae</i>	Oliver	NA
45	<i>Erythroxylum africana</i>	<i>Erythroxylaceae</i>	P. Browne	NA
46	<i>Ficus abutilifolia</i>	<i>Moraceae</i>	Miq	NA
47	<i>Ficus anomani</i>	<i>Moraceae</i>	Hutch	NA
48	<i>Ficus asperifolia</i>	<i>Moraceae</i>	Miq	NA
49	<i>Ficus exasperata</i>	<i>Moraceae</i>	Vahl.	NA
50	<i>Ficus mucoso</i>	<i>Moraceae</i>	Welw.	NA
51	<i>Ficus ovata</i>	<i>Moraceae</i>	Vahl.	NA
52	<i>Ficus populifolia</i>	<i>Moraceae</i>	Vahl.	NA
53	<i>Funtumia elastica</i>	<i>Apocynaceae</i>	Preuss	NA
54	<i>Hunteria umbellata</i>	<i>Apocynaceae</i>	K.Schum	NA
55	<i>Hylodendron gabunense</i>	<i>Fabaceae</i>	Taub - FWTA	NA
56	<i>Irvingia gabonensis</i>	<i>Irvingiaceae</i>	Aubry-Lecomte ex O'Rorke	NT
57	<i>Irvingia wombulu</i>	<i>Irvingiaceae</i>	Vermoesen	NA
58	<i>Khaya ivorensis</i>	<i>Meliaceae</i>	A.Chev.	VU
59	<i>Klainedoxa gabonensis</i>	<i>Irvingiaceae</i>	Pierre	LC
60	<i>Lannea schimperi</i>	<i>Anacardiaceae</i>	(Hochst) Engl.	LC
61	<i>Lophira alata</i>	Ochnaceae	Banks ex Gaertn	VU
62	<i>Lophira lanceolata</i>	<i>Ochnaceae</i>	Tiegh. ex Keay	LC
63	<i>Lovoa trichilioides</i>	<i>Meliaceae</i>	Harms	VU
64	<i>Monodora crispata</i>	<i>Annonaceae</i>	Engl. & Diels	NA
65	<i>Monodora myristica</i>	<i>Annonaceae</i>	Gaertn	NE
66	<i>Musanga cecropioides</i>	<i>Urticaceae</i>	R. Br & Tedlie	LC
67	<i>Nauclea latifolia</i>	<i>Rubiaceae</i>	Smith	LC
68	<i>Omphalocarpum procerum</i>	<i>Sapotaceae</i>	P.Beauv.	NA
69	<i>Parkia bicolor</i>	<i>Fabaceae</i>	A.Chev	LC
70	<i>Parkia clappertoniana</i>	<i>Fabaceae</i>	Keay	NA
71	<i>Pentaclethra macrophylla</i>	<i>Leguminosae</i>	Benth.	NA
72	<i>Piliostigma reticulatum</i>	<i>Leguminosae</i>	(DC.) Hochst.	NA
73	<i>Piliostigma thonningii</i>	<i>Leguminosae</i>	(Schum.) Mine-Redh.	NA
74	<i>Piptadeniastrum africanum</i>	<i>Leguminosae</i>	(Hook.f.) Brenan	NA
75	<i>Porterandia cladantha</i>	<i>Rubiaceae</i>	K.Schum.	NA
76	<i>Prosopis africana</i>	<i>Leguminosae</i>	(Guill. & Perr.) Taub	NA
78	<i>Pseudocedrella kotschyi</i>	<i>Meliaceae</i>	Schweinf.	NA
79	<i>Pterocarpus erinaceus</i>	<i>Leguminosae</i>	Poir.	NA
80	<i>Pterocarpus indicus</i>	<i>Leguminosae</i>	Willd.	VU
81	<i>Pterocarpus osun</i>	<i>Leguminosae</i>	Craib.	NA
82	<i>Pycnanthus angolensis</i>	<i>Myristicaceae</i>	(Welw.) Warb.	NA
83	<i>Rauvolfia macrophylla</i>	<i>Apocynaceae</i>	Stapf.	NA
84	<i>Rauvolfia vomitoria</i>	<i>Apocynaceae</i>	Afzel.	NA
85	<i>Ricinodendron heudelotii</i>	<i>Euphorbiaceae</i>	(Baill.) Heckel	NA
86	<i>Staudtia stipitata</i>	<i>Myristicaceae</i>	(Warb.) Warb.	NA
87	<i>Strombosia postulata</i>	<i>Olacaceae</i>	Oliv.	NA
88	<i>Tamarindus indica</i>	<i>Fabaceae</i>	L.	NA
89	<i>Terminalia catappa</i>	<i>Combretaceae</i>	L.	NA
90	<i>Terminalia browni</i>	<i>Combretaceae</i>	Fresen	NA

91	<i>Terminalia ivorensis</i>	<i>Combretaceae</i>	A.Chev.	VU
92	<i>Terminalia superba</i>	<i>Combretaceae</i>	Engl. & Diels	NA
93	<i>Tetrapleura tetraptera</i>	<i>Leguminosae</i>	(Schum. & Thonn.) Taub.	NA
94	<i>Uapaca togolensis</i>	<i>Phyllanthaceae</i>	Pax.	NA
95	<i>Vernonia anthelmintica</i>	<i>Compositae</i>	(L.) Willd.	NA
96	<i>Vernonia frondosa</i>	<i>Compositae</i>	Oliv. & Hiern	NA
97	<i>Vitex doniana</i>	<i>Verbenaceae</i>	Sweet	NA
98	<i>Xylopia quantasii</i>	<i>Annonaceae</i>	L.	NA
99	<i>Zanthoxylum zanthoxyloides</i>	<i>Rutaceae</i>	(Lam.) Zepern & Timler	VU

Annex 3: Faunal survey data

Mean primate sign densities (per km) and relative abundance (%) in the assessment area

Common name	Scientific name	Land-use type		RD (%)	IUCN Status	WCMC Status	Decree11
		Riparian	Wetland				
PRIMATES	PRIMATA						
Monkeys	<i>Cercopithecidae</i>						
Red-capped mangabey	<i>Cercocebus torquatus</i>	1	0	10.00	VU	I	1
Mona monkey	<i>Cercopithecus mona</i>	3	0	30.00	LC	I	2
White-throated monkey	<i>Cercopithecus erythrogaster pococki</i>	3	0	30.00	VU	I	1
Putt-nosed monkey	<i>Cercopithecus nictitans</i>	3	0	30.00	LC	I	2
Number sighted		10	0				
Number of species		4	0				

Mean ungulate sign densities (per km) and relative abundance (%) in the assessment area

Common name	Scientific name	Land-use type		RD (%)	IUCN Status	WCMC Status	Decree 11
		Riparian	Wetland				
UNGULATES	UNGULATA						
Pigs	<i>Suidae</i>						
Red river hog	<i>Potamochoerus porcus</i>	3	0	50.00	LC	R	1
Antelopes	<i>Antelopinae</i>						
Blue duiker	<i>Philantomba monticola</i>	3	0	50.00	LC	I	2
Number sighted		6	0				
Number of species		2	0				

Mean rodent sign densities (per km) and relative abundance (%) in the assessment area

Common name	Scientific name	Land-use type		RD (%)	IUCN Status	WCMC Status	Decree 11
		Riparian	Wetland				
RODENT	RODENTIA						
Squirrels	<i>Siuridae</i>						
Striped ground squirrel	<i>Euxerus erythropus</i>	1	1	15.4	LC	I	2
	<i>Protoxerini</i>						
African giant squirrel	<i>Protoxerus strangeri</i>	3	0	23.1	LC	I	2
Gambian sun squirrel	<i>Heliosciurus gambianus</i>	1	0	7.7	LC	I	2
Anomalures	<i>Anomaluridae</i>						
Beecroft's anomalure	<i>Anomalurus beecrofti</i>	1	0	7.7	LC	I	2
Porcupines	<i>Hystriidae</i>						
Brush-tailed porcupine	<i>Atherurus africanus</i>	1	0	7.7	LC	I	1
Cane rats	<i>Thryonomyidae</i>						
Marsh cane rat	<i>Thryonomys swinderianus</i>	1	1	15.4	LC	I	2
Mice	<i>Muridae</i>						
Zebra mouse	<i>Lemniscomys spp.</i>	1	0		NA	-	-
Pouched rats	<i>Cricetomyinae</i>						
Giant pouched rat	<i>Cricetomys emini</i>	3	0	23.1	LC	I	-
Number sighted		11	2				

Mean carnivore sign densities (per km) and relative abundance (%) in the assessment area

Common name	Scientific name	Land-use type		RD (%)	IUCN Status	WCMC Status	Decree 11
		Riparian	Wetland				
CARNIVORES	CARNIVORA						
Palm civets	Nandininae						
African palm civet	<i>Nandinia binotata</i>	1	0	16.7	LC	I	2
Cats	Felidae						
Wild cat	<i>Felis silvestris</i>	1	0	16.7	LC	-	1
Mongoose	Herpestidae						
Flat headed Cusimanse	<i>Crossarchus platycephalus</i>	2	0	33.3	LC	I	2
Marsh mongoose	<i>Atilax paludinosus</i>	1	0	16.7	LC	I	2
Scaly anteaters	Pholidota						
Tree pangolin	<i>Phataginus tricuspis</i>	1	0	16.7	VU	I	1
Number of species		5	0				
Number of signs		6	0				

Mean herpetofauna sign densities (per km) and relative abundance (%) in the assessment area

Common name	Scientific name	Land-use type		RD (%)	IUCN Status	WCMC Status	Decree 11
		Riparian	Wetland				
REPTILES	REPTILIA						
Snakes	Squamata						
Royal python	<i>Python regius</i>	1	1	25.0	LC	I	-
Gabon viper	<i>Bitis gabonica</i>	1	0	12.5	DD	I	-
Monitors	Veranidae						
Nile monitor lizard	<i>Varanus niloticus</i>	1	0	12.5	LC	I	-
Tortoises	Testudinidae						
Home's hinged-back tortoise	<i>Kinixys homeana</i>	1	0	12.5	VU	I	-
Geckos	Gekkonidae						
Ondo forest gecko	<i>Cnemaspis petrodroma</i>	3	0	37.5	DD	-	-
Number sighted		7	1				
Number of species		5	1				

Faunal species sighted and their location within the assessment area

SN	Land-use	Common name	Scientific name	No. sighted	Lat. (N)	Long. (E)
1	Riparian	African giant squirrel	<i>Protoxerus strangeri</i>	3	06°24'11.8"	5°15'49.5"
2		Giant pouched rat	<i>Cricetomys emini</i>	2	06°24'12.7"	5°15'50.3"
3		Red-capped mangabey	<i>Cercocebus torquatus</i>	4	06°24'13.2"	5°15'51.8"
4		Blue duiker	<i>Philantomba monticola</i>	1	06°24'29.4"	5°15'51"
5		Blue duiker	<i>Philantomba monticola</i>	1	06°24'28.5"	5°15'52.4"
6		Mona monkey	<i>Cercopithecus mona</i>	5	06°24'28.3"	5°15'54.3"
7		Putty-nose monkey	<i>Cercopithecus nictitans</i>	4	06°24'31.6"	5°16'6.2"
8		Flat-headed Cusimanse	<i>Crossarchus platycephalus</i>	1	06°24'33"	5°16'6"
9		Hinged-back tortoise	<i>Kinixys homeana</i>	1	06°24'30.3"	5°16'6"
10		Gambian sun squirrel	<i>Heliosciurus gambianus</i>	1	06°24'56.1"	5°14'27.5"
11		White-throated monkey	<i>Cercopithecus erythrogaster pococki</i>	5	06°24'56.1"	5°14'25.6"
12		African giant squirrel	<i>Protoxerus stranger</i>	1	06°24'55.7"	5°14'25"
13		Putty-nosed monkey	<i>Cercopithecus nictitans</i>	3	06°24'51.6"	5°14'26.6"
14		Beecroft's animalure	<i>Anomalurus beecrofti</i>	1	06°24'50.9"	5°14'28"
15		White-throated monkey	<i>Cercopithecus erythrogaster pococki</i>	4	06°24'48.8"	5°14'26.6"
16		Ondo forest gecko	<i>Cnemaspis petrodroma</i>	4	06°24'50"	5°14'27.8"
17		Mona monkey	<i>Cercopithecus mona</i>	3	06°24'36.7"	5°14'35.6"
18		White-throated monkey	<i>Cercopithecus erythrogaster pococki</i>	2	06°24'38.9"	5°14'31.7"
19		Ondo forest gecko	<i>Cnemaspis petrodroma</i>	2	06°24'39"	5°14'31.3"
20		African giant squirrel	<i>Protoxerus stranger</i>	1	06°24'37.3"	5°14'28.2"
21		Blue duiker	<i>Philantomba monticola</i>	2	06°24'36.3"	5°14'26.4"
22		Wild cat	<i>Felis silvestris</i>	1	06°24'37.5"	5°14'24"
23		Flat-headed Cusimanse	<i>Crossarchus platycephalus</i>	1	06°24'43.6"	5°14'6.1"
24		Red river hog	<i>Potamochoerus porcus</i>	7	06°20'40.9"	5°9'49.5"
25		Royal python	<i>Python regius</i>	1	06°20'29.3"	5°9'50"
26		Giant pouched rat	<i>Cricetomys emini</i>	2	06°20'39.4"	5°9'50.7"
27		Marsh cane rat	<i>Thryonomys swinderianus</i>	8	06°20'38.3"	5°9'51.2"
28		Zebra mouse	<i>Lemniscomys spp</i>	1	06°20'37.8"	5°9'51.8"
29		Ondo Forest gecko	<i>Cnemaspis petrodroma</i>	3	06°20'33.4"	5°9'52.9"
30		Brush-tailed porcupine	<i>Atherurus africanus</i>	1	06°20'39.4"	5°9'49.8"

31		Nile monitor lizard	<i>Varanus niloticus</i>	1	06°20'39.3"	5°9'49.1"
32		Red river hog	<i>Potamochoerus porcus</i>	6	06°20'37.4"	5°9'49"
33		Palm civet	<i>Nandinia binotata</i>	1	06°19'41.5"	5°12'38.8"
34		Red river hog	<i>Potamochoerus porcus</i>	5	06°19'32.2"	5°12'18.3"
35		Tree pangolin	<i>Phataginus tricuspis</i>	1	06°19'36.4"	5°12'27.7"
36		Marsh mongoose	<i>Atilax paludinosus</i>	1	06°20'37.4"	5°9'51.9"
37		Giant-pouched rat	<i>Cricetomys emini</i>	2	06°23'27.2"	5°9'52.9"
38		Putty-nosed monkey	<i>Cercopithecus nictitans</i>	3	06°21'17.5"	5°11'36.4"
39		African giant squirrel	<i>Protoxerus strangeri</i>	2	06°21'21.4"	5°11'37.4"
40	Wetland	Marsh cane rat	<i>Thryonomys swinderianus</i>	6	06°25'15.4"	5°15'40.1"
41		Striped ground squirrel	<i>Euxerus erythropus</i>	1	06°25'15"	5°15'30.4"
42		Royal python	<i>Python regius</i>	1	06°25'10.4"	5°15'57.7"

Annex 4: Avifaunal survey data

Bird species and their relative abundance in the assessment area

Common name	Family and scientific name	Land-use type		RD (%)	IUCN	WCMC	Decree 11
		Riparian	Wetland				
	Bucerotidae	24	0	2.9	LC	1	-
African grey hornbill	<i>Tockus nasutus</i>						
Red-billed dwarf hornbill	<i>Tockus camurus</i>	16	0	1.9	LC	1	-
Yellow-casqued hornbill	<i>Ceratogymna elata</i>	4	0	0.5	VU	1	-
African pied hornbill	<i>Lophoceros faciatius</i>	8	0	1.0	LC	1	-
Black-casqued hornbill	<i>Ceratogymna atrata</i>	6	0	0.7	LC	1	-
	Accipitridae	6	0	0.7	LC	1	-
Black kite	<i>Milvus nigrans</i>						
	Laniidae	23	0	2.7	LC	1	-
Long tailed shrike	<i>Cornvinella corvine</i>						
	Musophagidae	9	0	1.1	LC	1	-
Grey plantain eater	<i>Crinifer piscator</i>						
	Ploceidae						
Pin-tailed whydah	<i>Vidua macroura</i>	101	0	12.1	LC	1	-
Blue-billed malimbe	<i>Malimbus nitens</i>	30	0	3.6	LC	1	-
Red-vented malimbe	<i>Malimbus scutatus</i>	15	0	3.1	LC	1	-
Grey-headed sparrow	<i>Passer griseus</i>	6	0	0.6	LC	1	-
Bush sparrow							
Orange weaver	<i>Petronia dentate</i>	1	0	0.1	LC	1	-
Slender-billed weaver	<i>Ploceus aurantius</i>	52	1	6.3	LC	1	-
	<i>Ploceus pelzelni</i>	8	0	1.0	LC	1	-
	Corvidae						
Plied crow	<i>Corvus albus</i>	23	0	2.7	LC	1	-
	Pycnonotidae						
Yellow-throated leaflove	<i>Baeopogon indicator</i>	30	0	3.6	LC	1	-
Swamp palm bulbul	<i>Thesolocichla leucopleurus</i>	5	0	0.6	LC	1	-
Slender-billed Bulbul	<i>Andropadus gracilirostris</i>	10	0	1.2	LC	1	-
Common garden bulbul	<i>Pycnonotus barbatus</i>	20	0	2.4	LC	1	-
	Hirundinidae						
African river martin	<i>Pseudochelidon eurystomina</i>	10	240	29.8	LC	1	-
	Alcedinidae	8	0	1.0	LC	1	-
Grey-headed kingfisher	<i>Halcyon leucocephala</i>						
Shining-blue kingfisher	<i>Alcedo quadribrachy's</i>	1	12	1.6	LC	1	-

	Ciconiidae						
Marabou stock	<i>Leptoptilos crumeniferus</i>	20	0	2.4	LC	1	-
	Nectarinidae						
Olive bellied sunbird	<i>Nectarinia chloropygia</i>	15	0	1.8	LC	1	-
Splendid sunbird	<i>Nectarinia cocciniagaster</i>	8	0	1.0	LC	1	-
Blue-throated sunbird	<i>Cyanomitra cyanolaema</i>	4	0	0.5	LC	1	-
	Psittacidae						
African grey parrot	<i>Psittacus erithacus</i>	10	0	1.2	VU	1	-
	Hirundinidae						
Wire-tailed swallow	<i>Hirundo smithii</i>	20	0	2.4	LC	1	-
Grey-rumped swallow	<i>Pseudhirundo griseopya</i>	15	0	1.8	LC	1	-
	Pittidae						
Angola pitta	<i>Pitta angolensis</i>	2	1	0.4	LC	1	-
	Turdidae						
Rock thrush	<i>Monticola saxatilis</i>	1	0	0.1	LC	1	-
	Cuculidae						
Senegal coucal	<i>Centropus senegalensis</i>	15	0	1.8	LC	1	-
Black-throated coucal	<i>Centropus leucogaster</i>	5	0	0.6	LC	1	-
	Picidae						
Grey wood pecker	<i>Mesopicos goertae</i>	1	0	0.1	LC	1	-
Cardinal wood pecker	<i>Dendropicos fuscescens</i>	1	0	0.1	LC	1	-
	Estrildidae						
Chestnut-breasted negrofinch	<i>Nigrita bicolor</i>	1	0	0.1	LC	1	-
	Camprephagidae						
Blue cuckoo-shrike	<i>Coracina azurea</i>	5	0	0.6	LC	1	-
	Oriolidae						
Black-headed oriole	<i>Oriolus brachyrhynchus</i>	20	0	2.4	LC	1	-
	Coraciidae						
Blue-throated roller	<i>Eurystomus glularis</i>	1	0	0.2	LC	1	-
	Sylvudae						
Green hylia	<i>Hylia prasina</i>	1	0	0.1	LC	1	-
Stream warbler	<i>Bathmocercus cerviniventris</i>	1	0	0.1	NT	1	-
	Captonidae						
Yellow-breasted barbet	<i>Progoniulus chrysoconus</i>	5	0	0.6	LC	1	-
	Ardeidae						
Intermediate egret	<i>Egretta intermedia</i>	0	7	0.8	LC	1	-

Bird species sighted and their locations in the assessment area

SN	Location	Common Name	Scientific Name	Sightings	Lat. (N)	Long. (E)
1	Riparian	Grey hornbill	<i>Tockus nasutus</i>	10	06°24'14.4"	005°15'48.0"
2		African-plied hornbill	<i>Lophoceros faciatius</i>	8	06°24'14.5"	005°15'49.1"
3		Yellow-casqued hornbill	<i>Ceratogymna elata</i>	4	06°24'12.2"	005°15'49.4"
4		Black kite	<i>Milvus nigrans</i>	6	06°24'12.2"	005°15'51.3"
5		Long tailed shrike	<i>Cornvinella corvine</i>	7	06°24'13.9"	005°15'52.1"
6		Long tailed shrike	<i>Cornvinella corvine</i>	8	06°24'13.2"	005°15'51.8"
7		Grey plantain eater	<i>Crinifer piscator</i>	6	06°24'14.4"	005°15'52.5"
8		Pin-tailed whydah	<i>Vidua macroura</i>	70	06°24'12.6"	005°15'50.8"
9		Grey hornbill	<i>Tockus nasutus</i>	2	06°23'58.3"	005°15'47.9"
10		Grey plantain eater	<i>Crinifer piscator</i>	3	06°24'11.8"	005°15'49.5"
11		Slender-billed weaver	<i>Ploceus luteolus</i>	5	06°24'12.5"	005°15'52.5."
12		Pin-tailed whydah	<i>Vidua macroura</i>	20	06°24'14.2"	005°15'52.5"
13		Pin-tailed whydah	<i>Vidua macroura</i>	10	06°24'11.8"	005°15'49.5."
14		Red-vented malimbe	<i>Malimbus nitens</i>	20	06°24'13.2"	005°15'51.8."
15		Pied crow	<i>Corvus albus</i>	13	06°23'58.3"	005°15'47.9"
16		Yellow-throated leaflove	<i>Baeopogon indicator</i>	30	06°24'33"	005°16'5.2"
17		Grey-rumped swallow	<i>Pseudhirundo griseopya</i>	15	06°24'33"	005°16'6"
18		Wire-tailed swallow	<i>Hirundo smithii</i>	20	06°24'33.2"	005°15'51.1"
19		Angola pitta	<i>Pitta angolensis</i>	2	06°24'30.4"	005°16'6.5."
20		Rock thrush	<i>Monticola saxatilis</i>	1	06°24'30.3"	005°16'6"
21		Black-headed oriole	<i>Oriolus brachyrhynchus</i>	20	06°24'19.4"	005°16'04.9"
22		Grey hornbill	<i>Tockus nasutus</i>	4	06°24'54.8"	005°14'27.7"
23		Long tailed shrike	<i>Cornvinella corvine</i>	8	06°24'43.6"	005°14'6.1"
24		Grey-headed sparrow	<i>Passer griseus</i>	5	06°24'48.4"	005°14'5.6"
25		Pied crow	<i>Corvus albus</i>	10	06°24'38.3"	005°14'31.4."
26		Slender-billed bulbul	<i>Andropadus gracilirostris</i>	5	06°24'56.6"	005°14'12.6."

27	Swamp palm bulbul	<i>Thesolocichla leucopleurus</i>	10	06°24'56.5" 005°14'11.3."
28	Common garden bulbul	<i>Pycnonotus barbatus</i>	20	06°24'56.2" 005°14' 9.1"
29	African river martin	<i>Pseudochelidon eurystomina</i>	5	06°24'29.2" 005°14'19.6"
30	Grey-headed kingfisher	<i>Halcyon leucocephala</i>	8	06°24'28.7" 005°14'18.7"
31	Marabou stock	<i>Leptoptilos crumeniferus</i>	20	06°23'29.7" 005°14'8.6"
32	Olive bellied sunbird	<i>Nectarinia chloropygia</i>	15	06°24'56.4" 005°14'10.2"
33	Splendid sunbird	<i>Nectarinia cocciniagaster</i>	8	06°24'56.3" 005°14'9.8"
34	African grey parrot	<i>Psittacus erithacus</i>	10	06°24'42.9" 005°14'4.9"
35	Senegal coucal	<i>Centrous senegalensis</i>	5	06°24'37" 005°14'28.4"
36	Grey wood pecker	<i>Mesopicos goertae</i>	1	06°24'37.2" 005°14'28"
37	Cardinal wood pecker	<i>Dendropicos fuscescens</i>	1	06°24'38" 005°14'27.5"
38	Chestnut-breast negrofinch	<i>Nigrita bicolor</i>	1	06°24'36.2" 005°14'27.5"
39	Grey hornbill	<i>Tockus nasutus</i>	7	06°20'41.8" 005°9'48.3"
40	Orange weaver	<i>Petronia dentate</i>	1	06°20'39.1" 005°9'48.7"
41	Slender-billed weaver	<i>Ploceus pelzelni</i>	20	06°20' 39.3" 005°9'48.8"
42	Shining-blue kingfisher	<i>Alcedo quadribrachy's</i>	1	06°20'39.6" 005°9'49.7"
43	Senegal coucal	<i>Centrous senegalensis</i>	3	06°20'39.4" 005°9'50.7"
44	Blue cuckoo- shrike	<i>Coracina azurea</i>	5	06°20'40.4" 005°9' 48"
45	Blue-throated roller	<i>Eurystomus glularis</i>	1	06°20'34.9" 005°9'50.5"
46	Grey hornbill	<i>Tockus nasutus</i>	3	06°23'8.2" 005°9'34.2"
47	Red-billed dwarf hornbill	<i>Tockus camurus</i>	10	06°23'3.9" 005°9'29.1"
48	Orange weaver	<i>Petronia dentate</i>	20	06°23'18.8" 005°9' 44"
49	African river martin	<i>Pseudochelidon eurystomina</i>	3	06°23'32" 005°9'56.1"
50	Blue-throated sunbird	<i>Cyanomitra cyanolaema</i>	3	06°23'27.2" 005°9'52.9"
51	Senegal coucal	<i>Centrous senegalensis</i>	2	06°23'27.2" 005°9'53"
52	Green hylia	<i>Hylia prasina</i>	1	06°23'22.2" 005°9'49.9"
53	Red-billed dwarf hornbill	<i>Tockus camurus</i>	6	06°21'23.1"005°11'37.9"

54	Black-casqued hornbill	<i>Ceratogymna atrata</i>	5	06°21'26.2" 005°11'40.8"
55	Blue-billed malimbe	<i>Malimbus nitens</i>	10	06°21'21.4" 005°11'38.1"
56	Red-vented malimbe	<i>Malimbus scutatus</i>	15	06°21'26.1" 005°11'40.6"
57	Slender-billed weaver	<i>Ploceus pelzelni</i>	12	06°21'24.1" 005°11'32.8"
58	African river martin	<i>Pseudochelidon eurystomina</i>	2	06°21'24.3" 005°11'33.0"
59	Senegal coucal	<i>Centropus senegalensis</i>	1	06°21'26.2" 005°11'40.8"
60	Blue-throated roller	<i>Eurystomus glularis</i>	1	06°21'19.1" 005°11'36.7"
61	Blue-throated sunbird	<i>Cyanomitra cyanolaema</i>	1	06°21'18.2" 005° 11' 36.7"
62	Black-casqued hornbill	<i>Ceratogymna atrata</i>	1	06°21'26.2" 005°11'40.8"
63	Red-vented malimbe	<i>Malimbus scutatus</i>	11	06°19'34.9" 005°12'21.6"
64	Black-throated coucal	<i>Centropus leucogaster</i>	5	06°19'26.9" 005°12'10.3"
65	Senegal coucal	<i>Centropus senegalensis</i>	4	06°19'41.5" 005°12' 38.7"
66	Stream warbler	<i>Bathmocercus cerviniventris</i>	1	06°19'32.1" 005° 12' 18.7"
67	yellow breasted barbet	<i>Progoniulus chrysoconus</i>	5	06°19'31.6" 005°12'17.3"
68	Blue-billed malimbe	<i>Malimbus nitens</i>	1	06°19'34.7" 005°12'21.1"
69	Wetland African river martin	<i>Pseudochelidon eurystomina</i>	100	06°25'15.9" 005°15'30.6"
70	Shining-blue kingfisher	<i>Alcedo quadribrachy's</i>	12	06°25'13.4" 005°15'25.5"
71	Angola pitta	<i>Pitta angolensis</i>	1	06°25'16.1" 005°15'50"
72	Orange weaver	<i>Ploceus aurantius</i>	1	06°25'15.5" 005°15'30.6"
73	African river martin	<i>Pseudochelidon eurystomina</i>	80	6.40476° 5.21575°
74	African river martin	<i>Pseudochelidon eurystomina</i>	60	06°23'40.2" 005°13'1.5"
75	Intermediate egret	<i>Egretta intermedia</i>	7	06°23'45" 005°13'3"

Annex 5: Ichthyofaunal survey data

Identified fish species from streams and rivers in the assessment area

River	Lat.	Long.	Family	Species	Common name	Abundance	IUCN status
Eroko	06°24'12.0"	005°15'50.1"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	103	LC
	06°23'58.5"	005°15'49.0"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	51	LC
	06°24'27.0"	005°15'54.0"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	47	LC
	06°24'22.0"	005°15'54.8"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	22	LC
Aguohen	06°24'28.4"	005°14'19.2"	Cichlidae	<i>Coptodon guineensis</i>	Guinean tilapia	8	LC
	06°24'28.4"	005°14'19.2"	Cichlidae	<i>Pelvicachromis pulcher</i>	Rainbow Krib	10	LC
	06°24'28.4"	005°14'19.2"	Cichlidae	<i>Coptodon zilli</i>	Redbelly tilapia	43	LC
	06°24'28.4"	005°14'19.2"	Cichlidae	<i>Hemichromis</i>	Banded Jewelfish	85	LC
	06°24'28.4"	005°14'19.2"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	81	LC
	06°23'49.6"	005°14'16.8"	Cichlidae	<i>Pelvicachromis pulcher</i>	Rainbow Krib	2	LC
	06°23'49.6"	005°14'16.8"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	14	LC
	06°22'57.6"	005°14'15.2"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	5	LC
Ruber 10.1	06°20'42.2"	005°09'48.8"	Cichlidae	<i>Coptodon zilli</i>	Redbelly tilapia	8	LC
	06°20'42.2"	005°09'48.8"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	2	LC
	06°20'42.6"	005°09'48.3"	Hepsetidae	<i>Hepsetus akawo</i>	African Pike	1	LC
	06°20'42.6"	005°09'48.3"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	6	LC
	06°20'37.7"	005°09'50.8"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	1	LC
	06°20'35.1"	005°09'55.5"	Anabantidae	<i>Ctenopoma kingsleyae</i>	Tailspot ctenopoma	10	LC
Ruber 6.1	06°23'18.0"	005°09'44.3"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	10	LC
	06°23'17.8"	005°09'45.0"	Hepsetidae	<i>Hepsetus akawo</i>	African Pike	3	LC
	06°23'17.8"	005°09'45.0"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	2	LC
	06°23'20.8"	005°09'46.3"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	3	LC
	06°23'20.8"	005°09'46.3"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	5	LC
Umosan	06°21'25.3"	005°11'37.1"	Cichlidae	<i>Pelvicachromis pulcher</i>	Rainbow Krib	20	LC
	06°21'25.3"	005°11'37.1"	Cichlidae	<i>Coptodon zilli</i>	Redbelly tilapia	5	LC
	06°21'25.3"	005°11'37.1"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	35	LC
	06°21'25.3"	005°11'37.1"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	25	LC
	06°21'23.6"	005°11'36.7"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	25	LC
Okomu	06°19'41.4"	005°12'41.3"	Cichlidae	<i>Coptodon zilli</i>	Redbelly tilapia	12	LC
	06°19'41.4"	005°12'41.3"	Cichlidae	<i>Coptodon guineensis</i>	Guinean tilapia	6	LC
	06°19'41.4"	005°12'41.3"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	20	LC
	06°19'41.4"	005°12'41.3"	Cichlidae	<i>Pelvicachromis pulcher</i>	Rainbow Krib	10	LC
	06°19'41.4"	005°12'41.3"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	25	LC
	06°19'36.0"	005°12'28.6"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	10	LC
	06°19'36.0"	005°12'28.6"	Cyprinidae	<i>Barbus callipterus</i>	Clipper barb	30	LC
Wetland	06°25'19.5"	005°15'18.0"	-	-	-	-	-
	06°25'20.3"	005°15'19.6"	-	-	-	-	-
	06°25'17.6"	005°15'17.6"	-	-	-	-	-
	06°24'16.7"	005°12'56.8"	-	-	-	-	-
	06°24'10.0"	005°12'54.7"	-	-	-	-	-
	06°23'40.3"	005°13'03.0"	-	-	-	-	-
	06°18'38.5"	005°09'51.2"	-	-	-	-	-

06°19'41.4"	005°12'41.3"	Cichlidae	<i>Coptodon zilli</i>	Redbelly tilapia	12	LC
06°19'41.4"	005°12'41.3"	Cichlidae	<i>Coptodon guineensis</i>	Guinean tilapia	6	LC
06°19'41.4"	005°12'41.3"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	20	LC
06°19'41.4"	005°12'41.3"	Cichlidae	<i>Pelvicachromis pulcher</i>	Rainbow Krib	10	LC
06°19'41.4"	005°12'41.3"	Alestidae	<i>Brycinus longipinnis</i>	Longfin tetra	25	LC
06°19'36.0"	005°12'28.6"	Cichlidae	<i>Hemichromis faciatus</i>	Banded Jewelfish	10	LC
06°19'36.0"	005°12'28.6"	Cyprinidae	<i>Barbus callipterus</i>	Clipper barb	30	LC
Total					745	

HCV assessment report review checklist for non-ALS HCV report (RSPO P&C 2018: Interpretation of Indicator 7.12.2 and Annex 5)

Summary information

Name of RSPO member	Socfin S.A.
RSPO membership number	1-0269-19-000-00
Name of subsidiary / management unit	Okomu Oil Palm Company
Province/district and country of management unit	Ovia South West, Edo State, Nigeria, Africa
Date of HCV assessment report	September 2017
Name of lead assessor of HCV	Fatai Afolabi
Date of final review of HCV assessment report	8 November 2019
Result of review	Satisfactory

Status:

Y= yes, information is provided;

N = no, information is not provided;

Section	Information required	Status and comments
Executive summary	a) Key findings and recommendations of the main document captured, clearly presented and summarised	YES
	b) Reporting of identification of primary forest, peat, HCV areas and local communities land	YES
Scope of HCV assessment	a) List of Legal documents, regulatory permits and property deeds	No. No legal documents attached, but all the Company's history is provided Update (8 November 2019): Documentation provided by Socfin does satisfy the unconformities of the previous review.
	b) Maps - local and landscape level	YES, both local (property) and landscape, in one
	c) Purpose of the HCV assessment	YES
	d) Wider landscape context and description of the key social and biological features	YES, however consider that it does not state if UNESCO world heritage monuments or WWF biodiversity

		priority areas are present in this section. Only until the HCV identification the reader acknowledges that there is an IBA, which is not clearly shown in the map.
	e) Summary of the company and operations in the area	YES
	f) Impact and scale of the operations described	YES
	g) Documentation of any exploitation or land disputes / social conflicts prior the assessment and the remedial action plan	YES. Is written on the consulted literature as SIA finding but it is not annexed.
Assessment process and procedures	a) Names of HCV assessors and credentials	YES
	b) HCV Team leads: <input type="checkbox"/> RSPO approved assessor <input type="checkbox"/> Internal assessor	YES, led by a non-HCVRN ALS Provisionally Licensed Assessor
	c) Assessment methodology <ul style="list-style-type: none"> • Data sources • Timeline of assessment • Referenced guidance/toolkit • Data collection methodology • Efforts to fill gaps within the data, proportionate to the impact and scale of the operations 	<ul style="list-style-type: none"> • YES • YES • YES • YES • YES
	d) Stakeholder identification and consultation <ul style="list-style-type: none"> • Local communities • Social and environmental experts who have data or information and/or concerns to share • Other stakeholders that may be impacted 	<ul style="list-style-type: none"> • YES • YES • YES
Findings	Total HCV areas	YES, hectares are written in each identified HCV. Summary table comprising total HCV areas is provided at the Synthesis section
	Maps of HCVs of adequate resolution and clear labels	YES.
	HCV identification <ul style="list-style-type: none"> • Evaluation of the HCV definitions and provision of presence, potential presence or absence of HCV, supported by evidence (i.e. literature review, fieldwork, stakeholder consultation) • Use of precautionary approach in the use of data • Maps, reports and other data relevant to the time of assessment • HCVs 1-3 supported by field assessment results • HCVs 4-6 supported by evidence from participatory mapping and stakeholder consultation 	<ul style="list-style-type: none"> • YES • YES • YES • YES • YES • YES • YES, there are references to the generic toolkit since there is no HCV NI for Nigeria

	<ul style="list-style-type: none"> Reference to HCV toolkits e.g. NI or in the absence of NI, the generic HCV Toolkit guidelines Decisions to apply NI definitions/thresholds, or to deviate from its recommendations explained and justified Wider landscape considerations 	<ul style="list-style-type: none"> YES
	<p>Details of stakeholder consultation:</p> <ul style="list-style-type: none"> Dates Name, title or role (unless anonymity requested) Organisation or social group Key concerns/recommendation 	<ul style="list-style-type: none"> YES YES YES YES
HCV management and monitoring	Threat / risk assessment within and beyond the concession area	YES
	Management and mitigation plans for threats to HCV areas.	YES
	Management plans to enhance or maintain conservation values of identified HCV areas.	YES
	Management objectives clearly described and appropriate to the scale of operations	YES
	Plan for HCV monitoring and regular review of data.	YES
Management & monitoring planning and implementation personnel	Contact person / Personnel involved in planning & implementation	<p>NO. An E-mail is provided on the cover page, as the Organisation Commissioning HCV Assessment contact details. However, it is not clear whether or not this person is the head of the management and monitoring programme.</p> <p>Update (8 November 2019): Documentation provided by Socfin does satisfy the unconformities of the previous review.</p>