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Assessment of High Conservation Values in Parts of Okomu's Extension I Concession, Ovia SW Local Government Area, Edo State, Nigeria

Full HCV Assessment

Final | Version | 24 January 2016

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About Proforest

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Our work ranges from international policy development to the practical implementation of requirements on the ground, with a particular focus on turning policy into practice. Our extensive and up-to-date knowledge of the international context ensures that our work for individual companies and organisations is set within an appropriate framework. At the same time, we are able to bring a wealth of current practical experience to policy development processes and debates. The Proforest team is international and multilingual and has a broad variety of backgrounds, ranging from industry to academia and NGOs. This allows us to work comfortably in many types of organisations, as well as in a range of cultures. We have in-house knowledge of more than 15 languages, including Mandarin, Malay, French, Spanish and Portuguese.

Proforest was set up in 2000. Our expertise covers all aspects of the natural resources sector, from forestry and agricultural commodities to conservation, supply chain management and responsible investment.

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Proforest is a registered company in Ghana Company number CS115042012

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List of acronyms and abbreviations

ALS	Assessor Licensing Scheme
CEPF	Critical Ecosystem Partnership Fund
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered Species
DBH	Diameter at Breast Height
E S	Endangered Species
FAO	Food and Agriculture Organisation of the United Nations
FR	Forest Reserve
HCV	High Conservation Value
HCV RN	High Conservation Value Resource Network
IUCN	International Union for Conservation of Nature
LC	Least Concerned Species
NBSAP	National Biodiversity Strategy and Action Plan
NNPC	Nigerian National Park Services
NPC	National Population Commission of Nigeria
NPP	New Plantings Procedures
ONP	Okomu National Park
P & C	Principles and Criteria
PA	Protected Areas
RSPO	Roundtable for Sustainable Palm Oil
RTE	Rare, Threatened and Endangered Species
NT	Near threatened species
VU	Vulnerable Species

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1 Introduction and background

1.1 Purpose of the HCV assessment

This is a report of a full High Conservation Value Assessment (HCV) commissioned by Okomu Oil Palm Company (OOPC) Plc. located in the Ovia South West Local Government Area of Edo State of Nigeria. The purpose of this HCV assessment, being carried out within the context of RSPO certification, is to undertake a comprehensive and participatory assessment of HCVs in the areas planned for conversion within OOPC's Extension I Concession, with a view to identifying any area(s) required to maintain or enhance one or more of the six HCVs and local people's land that may be located within the concession. Specific objectives of this HCV assessment are to:

- Identify all HCVs and potential HCVs in the concession whose presence or integrity could be impacted by the proposed oil palm plantation development. This is to be carried out in consultation with all relevant stakeholders
- Identify existing or potential threats to the identified HCVs
- Mapping of all localised HCV areas
- Provide recommendations for the management, monitoring and protection of the identified HCVs in the area.

The process steps and activities conducted in due consideration of RSPO's New Plantings Procedure (NPP) and the HCV Resource Network Assessor Licensing Scheme requirements. In addition to the above objectives, the report covers contextual background information at various scales as well as the assessment methodology.

About Okomu Oil Palm Company Plc

Okomu is a subsidiary of Socfin, an agro-industrial group of companies operating in ten countries in Africa and South-East Asia. The parent holding company, Socfin Group is based in Luxembourg. Established in 1976 as a Federal Government Pilot Project aimed at rehabilitating oil palm production in Nigeria, the project covered an area of 15,580 ha of land located in a de-reserved area of BC9 and BC10 of the Okomu Forest Reserve at inception.

Ten years later, in 1986, OOPC acquired the project on which became the Main Estate of OOPC.

In 2001, OOPC acquired a further 6,119 ha of land approximately 5-10 km to the east of the 'Main Estate' from three different companies lyayi Brothers, Farms De Imienfan (Nigeria) Ltd and Aghimien & Company Ltd. for the development of rubber and oil palm plantations. This parcel of land is called Extension 1. Subsequently (in 2013), OOPC acquired 'Extension II' (circa. 11,416 ha) from A & Hatman Ltd. As of June 2015, the OOPC operations covered a total of 33,158 ha of land across three separate lease areas including the Main Okomu Estate and Extension 1 (both in de-reserved areas of Okomu Forest Reserve) and Extension 2 which is located in dereserved areas of Owan Forest Reserve also in the Edo State, but located about 140km from the Extension 1 Concession

RSPO requirements on HCVs

The RSPO Principles and Criteria (P&C) contain a set of mandatory requirements for new oil palm plantations intending to be certified under the RSPO certification scheme. These

requirements are contained in Principle 7 of the RSPO P&C, and requirements on HCV in Criterion 7.3, which states that "New plantings since November 2005 have not replaced primary forest or any area required to maintain or enhance one or more High Conservation Values". The RSPO's New Planting Procedure (NPP) which is currently undergoing a review also contains additional requirements for new plantings from 1st January 2010.

The NPP requirements apply to replanting of crops other than oil palm with oil palm. Therefore, the case of replacing an existing rubber plantation with oil palm is referred to as new planting.

1.2 HCV overview and references used

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 Forest Stewardship Council (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 listed in Box 1.

There is currently no HCV National Interpretation for Nigeria. There are the Nis for Ghana and Gabon but these are yet to be updated following recent update of the Generic Guidance document. Therefore, the process to identify HCVs and subsequent analysis and reporting has relied heavily on the following guidance documents:

- Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.).
 2013 (October). Common Guidance for the identification of High Conservation Values. HCV Resource Network. <u>https://www.hcvnetwork.org/resources/cg-identification-sep-2014-english</u>
- Brown, E. and M.J.M. Senior. 2014 (September). Common Guidance for the Management and Monitoring of HCVs. HCV Resource Network. . <u>https://www.hcvnetwork.org/resources/cg-management-and-monitoring-2014-english</u>
- 3. The HCV Assessment Manual prepared by Proforest for the HCV-RN.

Several other information sources have been used (see references) including the relatively recent reference: ZSL's Guide (ZSL, 2013) to Conserving HCV Species and Habitats in West African Oil Palm Landscapes. Others include an interpretation of global HCVF toolkit for use in Ghana published by WWF (Rayden et. al., 2006) and a similar version for Gabon (Stewart and Rayden, 2008).

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.

2 Description of the assessment area

2.1 Site description

Okomu's Extension 1 Concession is located in Edo State of Nigeria about 75km west of Benin City between the rivers Osse and Siluko to the east and west respectively and between longitude 5 ° 18' E and 5 ° 28' E and latitude 6° 15' N and 6° 25' N (Figure 1). The entire Okomu Extension I concession has an area of about 6, 119 ha. It is bordered to the west by Okomu National Park (ONP).

The assessment area includes an existing rubber plantation block of 500 ha unplanted areas in the northern portion of the concession (circa. 250 ha) as well as a tiny patch of degraded forest in the existing oil palm plantation (between the rubber plantation and the swamp forest block to the east). See Figure 1 below.

Most of the unplanted areas located in the southern part of the reserve (south of the Arakhuan River), and which adjoin to the Okomu National Park are not included in the scope of this HCV assessment¹. Therefore, the total assessment area for this HCV

¹ The southern part of Extension I is currently the subject of litigation between the company and migrant farmers currently located at Hassan Camp. While the company has legal rights to the area (which was originally part of the BC 9 block of the now de-reserved Okomu Forest Reserve) as evidenced by the certificate of occupancy

assessment is approximately 750 ha, with vegetation cover being predominantly rubber, lowland swamp forest and riparian vegetation. The main land use of the Okomu Extension 1 concession is oil palm and rubber plantations, accounting for approximately 40% and 60% of the total planted areas respectively. Figure 1 below shows the Okomu Extension I concession in its entirety, the assessment areas in the northern part of the concession, parts of the concession with existing oil palm and rubber plantation and, the area outside the assessment scope in the southern part of the concession.

The areas of natural vegetation in the assessment area is characterised by lowland swamp forest and riparian vegetation located in the north-eastern corner of the concession (in the 'A' Block as described OOPC's operational planning documents) and a tiny patch (less than 5 ha) of degraded forest located between the rubber plantation and the swamp forest in the north-east. This patch of forest is representative of a degraded semideciduous, humid, lowland rainforest type of south-western Nigeria. Freshwater swamp forests are also found along the Erudu River (also referred to as the Umalegidi Creek), which flows southwards from the swamp forest, along the eastern border of the concession.



Figure 1:Assessment areas (shaded black) within the Okomu Extension I concession. The sites consist of the block in the north-eastern corner, the double block of rubber flanked by oil palm and the tiny patch between the rubber and the degraded swamp forest

issued by the Edo State Government, the Hassan Camp community maintain that the land was given to their ancestors by the Oba of Benin even before the creation of the forest reserve. The case is being decided in court.



Figure 2: The location of the Okomu National Park relative to the Extension I concession and the assessment sites.

The patch of swamp forest in the north-eastern portion is evidently degraded, being selectively logged and under pressure from agricultural encroachment. However, it still retains variable, closed canopy in some areas (although several of the large emergent canopy trees have been removed). There are several economically important species as well as a relatively high degree of faunal biodiversity including an impressive variety of birds. Table 1 below indicates land-use types in the assessment area.

Table 1: Land-use type	and activities in the	assessment area
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Land-use type	Activity
Rubber Plantation	Monocultures of rubber in various stages of growth and development.
Forest patches	Slightly degraded and moderately degraded forest patches. The slightly degraded forest had a continuous upper canopy whilst the moderately degraded forests had a patchy canopy with small gaps interrupting the canopy and several emergent trees.
Riparian Vegetation	Assemblage of plant habitats and communities along the margins and banks of water bodies (rivers and streams), characterized by riverine vegetation and hydrophilic plants. These areas are constantly inundated for most parts of the year.

The OOPC's Extension I Concession was previously part of the Okomu Forest Reserve. Following de-reservation of parts of the forest reserve as a result of severe deforestation and forest degradation, the area was allocated to local private interests for oil palm and rubber development between 1993 and 2001. At the time of acquisition Extension 1 was described in the environmental and social risks identification and the rapid HCV assessment as being covered primarily by a mosaic of degraded forest, cocoa farms and farmland. The Arakhuan stream, flows in a south-east direction through Extension I and roughly divides the area into north and south. Figure 2 below shows the location of the Extension I concession in Edo State.



Figure 3: Location of the Extension 1 concession in Edo State, Nigeria.

2.2 The landscape context

Boundaries and land use of assessment landscape

The Extension I Concession falls within the Ovia South West Local Government Area (LGAs), which is one of eighteen LGAs in the Edo State. Ovia SW LGA has a total land area of 2,803 km² and has a population of 135,356 persons in 2006 and a growth rate of 2.74% (Housing and Population Census of 2006, NPC). The Extension 1 Concession is the location of the de-reserved BC 9 of the Okomu Forest Reserve, created in 1912. 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 to Extension I but separated from the assessment sites by existing blocks of rubber and oil palm plantations. See Figure 3 below.



Figure 4: Map showing Okomu National Park and Main Estate and Extension I to the west and east respectively and surrounding local communities.

Straddling the lowland rainforest and freshwater swamp belts of the Edo State, the landscape vegetation consists of a mixture of lowland rainforest on higher ground, freshwater swamp forest in riparian areas and mangrove swamp further southwest towards the coast. To a large extent, the lowland rainforest is most degraded due to its accessibility and the attractiveness of the land to local farmers. The swamp forest is relatively less disturbed but largely degraded by a combination of factors including logging, NTFP collection and hunting. A mosaic of disturbed secondary forest interrupted by agricultural land is characteristic of the wider area.

The landscape around the Okomu Extension I Concession is highly varied (Figure 2). Apart from the occurrence of the Okomu National Park and large-scale rubber plantations, it is dominated by the following anthropogenic land uses:

- Small-scale, mixed-crop and subsistence agriculture (including 'taungya' farming). The focal crops are cassava, maize, plantain and yam, and occasionally melon and pineapple
- Low-intensity rubber plantations,
- Pockets of bush fallows which have been farmed and abandoned,
- Planted teak and Gmelina arborea stands,
- Pockets of bamboo stands

A number of land use activities including settlement, farming, plantations, logging and timber processing as well as forest management occur within the landscape. However, agriculture which is the mainstay of the population within the landscape is the most common land-use activity. A wide range of food and cash crops are produced within the landscape. Farming is not an exclusively rural occupation, as many city dwellers own farms on the outskirts of the capital and commute regularly to work in their farms.

Aside from agriculture, other important industries in Edo State include mining for minerals (such as quartzite, marble, clay, limestone, chalk, gypsum and gold), petroleum and gas extraction, timber processing, small-scale garri processing and manufacturing.



Figure 5 Wider landscape context of assessment area, including the ONP and the main estate to the west of Extension I.



Figure 6: Land cover map of Extension I concession and its immediate environs including the ONP. NB: Most of the natural vegetation in the middle of the Extension I concession has been replaced with rubber plantation.

Demographic and socioeconomic context

Edo state had a population of 3.2 million and population density of 184 people/sq km according to the official census of 2006. Although more recent figures are not available, Edo State's population and population density will now be considerably higher, and given that the state's population density in 2006 was considerably higher than the national average (152 people/sq km), current population density in the state most probably exceeds 200 people per square km. Population and demographic information for the communities in the catchment areas of Ext 1 are not readily available. The most recent population and Housing Census conducted by Nigeria was in 2006. The population of the Ovia South West Local Government Area from the 2006 census is 138,072 persons. This consists of 72,113 males and 65,959 females. The State is made up of three major ethnic groups; namely the Binis (57.5% of the population), Esan (17.1%) and Afemai comprising of the Etsako (12.2%).

The two big communities affected by the Main Okomu Estate are the Udo and Nikrowa. Traditionally, Udo is the landholding community for the land within which both the Main Estate and Extension 1 are located. The Paramount Chief of Udo, His Royal Highness Patrick Igbinidu, was designated by the Oba of Benin as the paramount chief of the area and with traditional jurisdiction over the land that contains Okomu Forest Reserve. The chief of Udo pays homage to the Oba of Benin directly as the Iyase. As the Paramount Chief, there are sub-chiefs whose traditional title is Odionwere under him within the traditional structure of the area. Udo is the main settlement.

Nikrowa is the largest settlement southeast of Extension 1. The inhabitants of Nikrowa are the Ijaws who are riverine fishing people spread right across the freshwater swamps, mangroves and the coastal areas of southern Nigeria from Lagos east to Calabar in the Cross River State and beyond.

There are a total of nine communities within the wider catchment area of Extension I. However, the communities within its immediate catchment are Hassan Camp, Gbelebu, Gbele Oba, Opuama, Evboiruebor, Adeola, Bisi Camp and Udo (a relatively larger town). Nikrowa and Ofunama lie further south while AT&P, Madagbayo and Gbelebu lie north, just outside the Main Okomu Estate (Figure 3).

The typical leadership structure of surrounding villages is hierarchical and identifies the Edion as the head of the village council, and the Odionwere or the oldest man in the village in charge of the small village and who is the head of council of elders from the constituent lineages. The villages in the landscape fall under the traditional administration of the lyase of Udo.

Protected and key biodiversity areas in the landscape

The forest reserves/protected areas in the landscape include the Ologbo Forest Reserve, the Orle River Game Reserves, and the famous Okomu National Park. Approximately 20 kilometres southeast of the ONP lies the heavily degraded and partially de-reserved Ologbo forest reserve. To the west of the Ologbo reserve are the Ekenwan and Gili-Gili forest reserves. All except the ONP are extensively degraded.

Despite the challenges in conserving the area, Okomu FR remained a focus for conservation in south-west Nigeria. In 1995, a comprehensive Master Plan was developed for the Management of the Okomu Forest Reserve. This management plan recognised the

need for a pragmatic approach to conservation in the FR that took into account the numerous human pressures on the forest and the need for multiple land uses, with the primary focus of conservation being the Okomu National Park.

The Okomu Forest Reserve (OFR) of which the Okomu National Park is an integral part consists of semi-deciduous, humid, lowland rainforest and is representative of this rapidly disappearing ecosystem of south-western Nigeria. OFR contains several freshwater swamp forests along major rivers. The African mahogany family (Meliaceae) is well represented including: *Khaya ivorensis, Entandrophragma angolense, Entandophragma cylindricum, Guarea cedrata, Guarea thompsonii* and *Lovoa trichilioides*. Other economically important species include *Milicia excelsa, Gossweilerodendron balsamiferum, Terminalia ivorensis, Terminalia superba* and *Triplochiton scleroxylon*.

According to the management of the Okomu National Park and findings from literature reviewed, the forest contains a viable population of the one of the African most threatened primates and one of the two monkeys endemic to Nigeria, the Nigerian Whitethroated monkey. It is known to host a population of the rare Red-capped mangabey and at the same time one of the last refuge of Chimpanzees in Nigeria. It also serves as a home to two other primates, Mona Monkey and putty-nose monkey. Besides, the National Park is home to several species of importance including the forest buffalo, Red River Hog, Forest elephant (globally threatened), Yellow-backed duikers, Africa dwarf crocodile, Red river hog and impressive variety of birdlife and butterflies.

As a result of this status, Okomu NP has been identified by Birdlife as an Important Bird Area (IBA). 150 bird species have been recorded in the NP, including the IUCN VU Yellowcasqued hornbill (*Ceratogymna elata*), and nationally rare Black-casqued hornbill (*C. atrata*). A number of recent studies also cite Okomu NP as a critical refuge for some of Nigeria's most threatened and high profile mammals. For example, the south of the Okomu NP is known to support a declining population of IUCN Endangered African forest elephants (*Loxodonta africana cyclotis*).

Physical features

The topography of the area is gentle, ranging from about -30 to 216 metres above sea level with very few noticeable slopes or hilly areas. Rivers and swampy areas are quite prominent in the landscape that support both the swamp ecosystem and subsistence of local communities. Topographically, the Okomu landscape is consistently flat and gently undulating throughout, with no steep slopes. The landscape is drained by the Okomu River and several of its tributaries. The main river that drains the portion of the forest allocated to OOPC is the Arakhuan River which drains into the southerly flowing Osse River that forms the eastern boundary with OOPC's land. Due to the high level of the water table of the area, there are several areas in the landscape where the water table rises above ground level to form pools and marshes, majority of which dries up in the dry season.

Located within one of the best tropical forest areas of Nigeria, the area has high rainfall with mean annual rainfall of about 2,100 mm with the period February to November being the main rainy period with peak in June, July and September. The driest months of the area are the months of December and January. Temperatures average about 25°C in the rainy season and about 28°C in the dry season. Mean monthly is 30.2° C with relative humidity of about 65% during the afternoons throughout the year.

The landscape falls within a geophysical region known as Western Coastlands which is characterised 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 Osse River, the largest of which is the Arakhuan Stream, which flows through the planted northern section of Extension I from the ONP. Many of the smaller streams that occur in the area are fed by springs and flow year round.

2.3 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 endemics, 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 during the last century (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 indicates the presence of over 135 reptilian species, 109 amphibian species, and 648 fish 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 (70% of which reside in the rural areas) and effective enforcement of 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, reported that only 10% of Nigeria's land area or 10 million ha was forested, and that ~400,000 ha of forest was lost annually. Nigeria's forest estates have suffered from severe overexploitation due to logging and widespread de-reservation for agriculture, industry and urbanisation.²

As indicated earlier in the previous section, 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. For example, the Arakhuan Ridge east of the ONP (which directly borders the southern part Extension I) is known to support a declining population of IUCN Endangered African forest elephants (*Loxodontia Africana cyclotis*). This emphasizes the sensitive location of the OOPC plantations, either side of the ONP (Figure 3), and how management activities in the OOPC concessions and actions of workers could pose a threat to the Park. At the same time, this proximity means that OOPC is ideally placed to actively contribute to conservation in the National Park, in addition to the plantations acting as a buffer that prevents encroachment into the Park. It is important to emphasize the fact that the assessment areas are disconnected from the ONP by the existing rubber and oil palm plantations to the west (Figure 3).

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

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

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

3) **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 is prohibited,

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

5) **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 Shrine in Oshun State.

² http://www.fao.org/forestry/20406-0d1f56d9ee7a6fd2079bcd520715362c3.pdf

3 HCV assessment team

The HCV assessment process was led by an HCVRN ALS Provisionally Licensed Assessor from Proforest, working together with a team of local experts in Nigeria. Table 2 outlines the key team members and their respective roles in the assessment process. Biographies of team leaders and key team members are provided in Annex1.

Table 2: Summary of HCV assessment team experience.							
Name	ALS Licence	Organisation	Role	Expertise			
Nana Darko Cobbina	Provisional (ALS15034NC)	Proforest	Lead Assessor	Social expert, stakeholder engagement, participatory mapping			
Abraham Baffoe	Provisional (ALS15006AB)	Proforest	Team member	Forest Ecology, Hydrology, Biodiversity, conservation			
Dr Armand Yevide Sedami	NA	Proforest	Team member	Forest ecology, GIS, conservation,			
Joseph Ugbe	N/A	Independent Consultant	Team member	Forest inventory, botanical survey, ecology and fauna survey			
Akomaye Ashikem	N/A	Independent Consultant	Team member	Forest inventory, botanical survey and fauna species identification			
Dr Emmanuel Danquah	N/A	Independent Consultant	Team member	Ornithologist and mammal expert			

4 Methods and timelines

4.1 Timeline for the assessment

Following a scoping exercise in July, the field work started on 21 September 2015 through 02 November 2015. Details of the assessment timeline are provided in Table 3 below.

Process Steps	Main activities	Timeline							
		Jun	July	Aug	Sept	Oct	Nov	Dec	Jan
Pre-assessment	Data and information collection including C								
	of O from OOPC and review of same								
	Field scoping visit and stakeholder meetings								
	including meeting with SIA team								
	Analysis of information including feedback								
	to client								
	Preparation of Full HCV assessment proposal								
	and development of assessment methods								
Field assessment	Botanical and fauna survey including								

Table 3: Assessment timeline

	ecosystem typing				
	Participatory mapping and identification of				
	social HCVs				
Communities	Communities consultations				
and stakeholder	Consultations with state and local				
consultations	government agencies, experts and NGOs				
	government agencies, experts and NGOS		 	 	
Analysis drafting	Analysis of field data and drafting of report				
of report					
Peer Review of	Peer review of report by Elizabeth Yaap				
reports					
Finalization of	Finalization and submission of report				
report					

4.2 Assessment methods

The assessment methods were structured in two phases: pre-assessment phase and full HCV assessment phase. The pre-assessment included such methods as desk and webbased research 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 their application, including biological surveys, stakeholder consultation and participatory mapping.

4.2.1 Scoping

In July 2015, Proforest undertook a gap analyses for OOPC's Main Estate and Extensions I and II Concessions against multiple sustainability standard requirements. The process and outcomes from this baseline assessment served the purpose of a scoping exercise. Much of the desk-based information and key stakeholders to engage as well as most of the baseline socio-economic information was generated during this exercise.

4.2.2 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 into Tier 1 (high risk) and 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 the table results in classifying the assessment as high risk and therefore Tier 1. Table 4 below analyses the risk rating of the OOPC Extension I HCV assessment.

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
Rating		
Scale of project: the overall area (ha) affected	Will the operation cover or	No . The total area of the assessment site approximately

Table 4: Assessment Tier Rating

by production activities.	affect more than 50,000 ha	750 ha contained in the 6119 ha Extension I Concession (most of which is already planted with rubber and oil palm).
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.	Is conversion of more than 500 ha of natural ecosystem or habitat planned	No. The total area of the assessment site is approximately 750 ha, including a 500 ha over-mature rubber stand to be converted.
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.	Does the lead HCV assessor hold a provisional licence?	Yes
Threats to biodiversity : production activities that may disturb or damage a national or international priority biodiversity area.	Does the project area contain, border or overlap with any priority biodiversity areas?	No. The assessment area is separated from the ONP by a stretch of oil palm and rubber plantations in the Extension I concession which borders ONP.
Local and indigenous people : populations of people that overlap and/or use resources in the project area	Are there local or indigenous peoples living in or using the area that have claims to land, water and or natural resources in the project area?	No. There are no communities living in the assessment area.
Within certification schemes. If used outside of a widely recognised certification scheme, there is a higher risk that complementary safeguards may be lacking.	Is the HCV assessment taking place outside of a recognised certification scheme?	No . Socfinaf is in the process of applying for RSPO certification.
Result		Tier 1

4.2.3 Desk-based literature review

A desk-based study was conducted to gather and analyse as much available relevant literature of the site and potential HCV values as possible. Several studies, reports, maps and official documents from diverse sources have been reviewed.

4.2.4 Consultations with State government agencies and other stakeholders

Consultative meetings were organised with the relevant government institutions responsible for land administration, agriculture, forestry and natural resource management. Institutions consulted included the Ministry of Environment and Forestry,

the Ministry of Agriculture and the Ovia South West Local Government Area. The NGOs, Nigeria Conservation Foundation and Environmental Rights Action/Friends of the Earth Nigeria were also consulted during the fieldwork. Discussions were also had with staff of Foremost Development Associates, one of the consulting firms who carried out the environmental and social-economic impact studies.

4.2.5 Socio-economic survey and communities consultations

Results from the baseline social/socio-economic survey carried out by ERM and FDA have been complemented with broad community-level consultations carried out during the fieldwork. The socio-economic study assessed the potential impacts of the Extension I operations on the area through among others:

- Determination of the demographic profile of the local population including population numbers and the origin of migrants.
- Investigation of livelihood strategies, resource use patterns and income generating activities.
- Assessment of physical assets and structures owned, the current level of infrastructural development and priority needs.
- Identification of the types, prevalence and significance of socio-cultural sites.
- Finding out the past and potential sources of local social conflict.
- Investigation of the relationship between the communities and land ownership.

To complement the results of the socio-economic study, public meetings were held in all eleven communities involving a cross-section of all stakeholder groups present including the Odionwere and his elders, women, youth, farmers, fishermen, hunters and other identifiable groups. Outcomes from the community meetings are detailed in Annex 2.

Participatory Mapping

Where there was indication that local communities use resources from the assessment area, participatory mapping was done to determine nature and distribution of utilised resources. Participatory mapping was done in **seven out of eleven** communities surveyed. The approach was to present a map of the area and ask participants of FGDs or wider community meetings (led by persons who are able to understand the map) to indicate the location of the particular resource mentioned.

4.2.6 Assessment of fauna and flora

In carrying out the field verification of flora and fauna, vegetation maps of the area were analysed as part of the planning process for the field verification. The field assessment of flora and fauna in the concession was undertaken to:

- Obtain a better understanding of vegetation cover of the concession
- Assess floristic composition of the vegetation of the area with focus on presence and abundance of species of conservation concern;
- Assess the presence of fauna species in the concessions, their distribution and their conservation importance and;
- Identify areas with reasonable forest cover or special habitat of interest that could be set aside and precluded from conversion to oil palm plantation.



Farmers at Bisi Camp show location of farms at 'A'



Floral survey team at 'A' Block

The field data obtained from the survey were analysed to identify the different biological HCVs present in the concession.

Sampling design and distribution of transects for fauna survey

The fauna environment that was sampled included large mammals, small terrestrial mammals, avifauna and herpetofauna. Sampling was conducted in October 2015 along selected trails and transects in purposely distributed sampling plots (500m x 500m). A minimum of one kilometer was searched on survey transects in each plot. The first transect of each plot was randomly placed whilst subsequent ones were distributed systematically (Norton-Griffiths 1978).

Information on large mammals was systematically obtained by direct observation and record of signs (vocalizations, droppings and footprints) along trails and foot paths within the selected sampling plots. Surveys were conducted during the early hours of the day and evenings.

Bird surveys were also conducted opportunistically along the trails and foot paths within the sampling plots. Direct observations, including visual as well as vocal records were made to determine bird species occurrence.

Reptiles and amphibians surveys involved casual observations and refuge examinations (searching under rocks, logs, in rotten tree stumps, in leaf litter, old termite mounds and rodent burrows) within the sampling plots. Sampling for small terrestrial mammals involved a systematic live trap lay-out (10 meter intervals, with a total of 10 laid in the rubber block) in addition to casual observations and refuge examinations (searching under rocks, logs, in rotten tree stumps, in leaf litter, old termite mounds and rodent burrows) along line transects. All captured and identified specimens were released as soon as possible at the point of capture. In some cases, additional information was obtained by interviewing local people. Pictures in field guides (Stuart and Stuart, 2006 and Happold, 1990) were shown to the local people to help in the identification of the mammals; it also gave the opportunity for others to corroborate or challenge the authenticity of information given.

Sampling design for flora survey

Using a systematic random sampling approach, a total of 8 plots were laid fairly distributed across the assessment sites, applying a sampling intensity of 1 percent. At the mature rubber stand, five 500m x 20m (i.e. 1 ha) sample plots were selected while three sample plots were laid at the 'A' block located at the north-easternmost part of the Concession. A 500m long transect was laid through the middle of each plot in an east-west direction with aid of GPS and a compass. Data and information on trees within 10m from both sides of the 500m transect within the plot were collected for each plot.



Figure 7: Layout of sample plots and transect line.

The variables recorded were species name and Diameter at Breast Height (dbh). Characteristics of the trees such as whether they are forked, fluted, multi-stem, coppice, etc. were also recorded. Additionally, other features of conservation interest were recorded; spotters looked out for and recorded fruiting trees, seed trees, hollow trees, etc. in order to get a better idea of the regeneration potential. Within each quadrat, all trees and regeneration seedlings and saplings were recorded. Additionally, descriptive information about the area (such as farm, regenerating area, etc.) was also noted.

5 Assessment findings/HCV identification

This section presents an overview of the HCVs that were identified in OOPC's Extension 1 concession. For each of the HCVs, information is provided about their identification, current status and potential threats to their continued existence. The definitions and identification used for the presence, potential presence or absence of HCVs follow the Common Guidance for the identification of High Conservation Values). Table 6 below indicates presence and absence of HCVs.

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.			
2	Landscape-level ecosystems and mosaics. 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.			
3	Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.			
4	Ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.			
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.			
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			

Table 5: Summary of HCV assessment findings

indigenous peoples.

5.1 HCV 1 Species diversity

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 which contain such species or the habitats necessary for their continued survival may be considered as HCV areas. However, these species must be present in global, regional or nationally significant concentrations.

Finding

HCV Key question

HCV 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.

5.1.1 Identification

Assessment of the HCV 1 has been based on field surveys, literature review and consultations with national experts and other stakeholders. Biodiversity surveys were carried out in both the rubber plantation block (to be converted to oil palm) and the unplanted areas (at the 'A' and 'B' blocks of Extension I).

Flora

The vegetation cover of the assessment area is largely over-mature rubber plantation (500ha) and the unplanted area of natural vegetation. (250ha). The area of natural vegetation in the assessment area is characterised by lowland swamp forest and riparian vegetation located in the north-eastern corner of the concession. This patch of swamp forest is evidently degraded, being selectively logged and under pressure from agricultural encroachment (several farmlands were noted to occur in the accessible areas). However, it still retains variable, closed canopy in some areas with some economically important species (although several of the large emergent canopy trees have been removed).

A total of 75 tree species of 25 families with dbh \geq 10 cm were identified to be present in the assessment area (i.e. the 'A' and 'B' blocks).

Fauna

Four taxonomic groups, representing large mammals from 14 Family groups; small terrestrial mammals from 2 Family groups; avifauna from 22 Family groups and herpetofauna from 6 Family groups were observed to be present in the 'A' Block. Three of the fauna recorded, White-throated Monkey (*Cercopithecus erythrogaster*), Dwarf Crocodile (*Osteolaemus tetraspis*) and Tree Pangolin (*Dendrohyrax dorsalis*) are listed in the IUCN Threatened Species List as Vulnerable, Vulnerable and Near Threatened respectively. The bird fauna contains several rare birds, endemic to- but with a wide distribution in- the Upper Guinea Forest. These include the African Grey Parrot (*Psittacus erithacus*) and 9 birds of prey (*Accipitridae*) that are locally important (Schedule 1) under

Nigerian law. Several of the recorded species of the families Varanidae (*Varanus niloticus*), Pythonidae (*Python regius*), Psittacidae (*Psittacus erithacus*), Musophagidae (*Tauraco persa*) and Testudinidae (*Kinixys erosa*) are listed in Appendix II of CITES. The most prominent carnivores were mongooses (*Atilax paludinosus, Crossarchus obscurus*), followed by genets (*Genetta servalina*) and then civets (*Civettictis civetta*) and pangolins (*Manis tricuspis*). All these species are generally affected by habitat changes but Civets and Mongooses are especially vulnerable to habitat loss, which may pose a threat to them in the concession.

5.1.2 Discussion and justification

The flora survey carried out at the assessment site revealed that, the dominant plant species were Moraceae, Irvingiaceae and Guttiferae, all of which are reported to occur commonly in the wider landscape. Borokini (2014) confirmed the presence of 18 endemic and threatened flora species (including herbs, trees, shrubs and liana) belonging to 15 Families in Nigeria. Six species on the IUCN Red List are reported (Borokin, 2014) to have a fair natural distribution in the southern region of Nigeria. However, no flora species on the IUCN Red List were noted to be present in the assessment area.

The Okomu National Park occurs in the assessment landscape. The Okomu National Park has been identified by Birdlife as an Important Bird Area (IBA). A number of recent studies also cite Okomu NP as a critical refuge for some of Nigeria's most threatened and high profile mammals. In its own right therefore, the Okomu National Park qualifies to be considered as a HCV 1 area. However, the assessment sites neither overlap into- nor adjoin with the Park.

A recent study (Akinsorotan et. al., 2011) identified a high mammal diversity and density along the Arakhuan Ridge in the east of the Okomu NP, including a thriving population of white-throated guenons. However, the Arakhuan Ridge directly borders the southern part of OOPC's Extension 1 which itself is largely degraded with several settlements and farmlands in the vicinity. Nevertheless, as noted earlier, this area south of the Arakhuan River is outside the assessment scope.

Most bird species were recorded in the Forest Vegetation (60), then Riparian Vegetation (41) and then Rubber (20). Apart from the African Grey Parrot (Psittacus erithacus) which is a typical primary forest species, most of the birds recorded were either forest fringe species or birds of farmland or secondary growth. While the concentration of birds of conservation of bird population found in the swamp forest would not qualify as globally, regionally or nationally significant, their continued protection is safeguarded given the strong likelihood that the area would be set aside for other high value characteristics (rare, threatened and endangered ecosystem).

The fauna in the natural vegetation area is relatively fairly impressive. Out of the 59 species of medium to large mammals confirmed to be present in the Niger Delta of Nigeria (Blench, 2007), 20 were recorded. However, generally, the occurrence of primates was rare and it is difficult to make any realistic assessment of their status. Nevertheless, previous studies carried out in the area indicate that their numbers are extremely low. Nevertheless, no mammals that are typically found in the ONP and that are classified as threatened or endangered in in the IUCN Red List have as yet been identified within the

assessment site. All of the species listed as being of international significance are considered to be fairly widespread in Nigeria and habitat generalists – capable of surviving in both mature forest and degraded and highly fragmented habitat, with none exclusively dependent on primary or mature forest cover.

No comparative systematic review has been made of effects on biodiversity from oil palm and rubber production at the study sites. However, it is reported (Savilaakso et al., 2014) that overall, both oil palm and rubber plantations have reduced species richness compared with primary and secondary forests, and the composition of species assemblages' changes significantly after conversion to either oil palm or rubber.

In view of the foregoing, HCV 1 is concluded to be absent in the concession. While HCV 1 is deemed not to be present given the concentration of species (diversity) which are neither regionally or nationally significant, it is instructive to note that some of the individual species are protected under other national environmental management principles and more importantly that, the 'A' Block area qualifies as a HCV 3 area (rare, threatened and endangered ecosystem). See below.

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

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	Do the two concession areas contain or form part of a regionally or nationally significant large landscape forest or does it adjoin such forests?	Absent

5.2.1 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 (implicitly) the great majority of other environmental values occurring in such ecosystems.

HCV 2 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. In assessing the presence of HCV 2, the following questions were posed:

- Does the dominant forest block within the concession represent a reasonably unfragmented block of forest of at least 50,000 hectares?
- Are the forest habitat types of the concession connected to an adjacent large landscape level forest?
- What is the status and distribution of the dominant habitat types within the concession connected with the adjacent large landscape level forest?
- Will the loss or severe degradation of the connected forest areas significantly impact habitat or ecosystem function of the adjacent large landscape level forest?



5.2.2 Discussion and justification

The assessment area as well as the wider Extension I Concession (within which it is contained), although originally a part of the de-reserved Okomu Forest Reserve, is now severely degraded and located within a much degraded landscape characterized by commercial oil palm plantations, smallholder food crop farms, large number of settlements and bush fallows. Remaining forest cover is highly fragmented throughout the landscape. The only large contiguous block of forest cover in the landscape is the 20000 ha Okomu National Park. Other forested areas consist of the small and isolated swamp forest patches. There is limited connectivity between the ONP and other protected areas or forest reserves or between patches of areas with natural vegetation. Outside the ONP, there is very little natural vegetation which would form a large (i.e. greater than 50 000 ha) contiguous area of natural ecosystem or habitat. It is therefore unlikely that HCV 2 is present. Rather, it is more likely that any values related to ecosystems and habitats or species distribution would be better suited to HCV 1 and HCV 3 classification. The 20,000 ha ONP represents the largest block of lowland rain forest in a landscape dominated by

highly degraded forest fragments devoid of any connectivity with the Park. A buffer area is presently effectively established between the National Park and the Extension I concession by the recent construction of a major access road through the Park to serve neighbouring villages. Furthermore, the existing forest habitat types (circa. 250 ha of swamp forest) contained in the assessment area are not connected to the ONP which is several kilometres away.

In view of the foregoing, HCV 2 is confirmed to be absent.

5.3 HCV 3: Rare, threatened or endangered ecosystems

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 concession fall within or contain an ecosystem that is	Present
	considered to be rare, threatened or endangered?	

5.3.1 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. Hence all existing forests in the country would be a priority for conservation.

Given that no reference toolkit exists for Nigeria. However, previous consultations with experts, combined with the use of the precautionary approach has resulted in consideration of the following types of vegetation as HCV 3:

- 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.
- All areas with montane forests- due to their rarity at the national level
- All areas containing mangroves and swamps due to their rarity and threat to their continued existence
- Areas with coastal low forest.

Montane Forests



No montane forests were observed in the concession as the concession lies on a relatively flat land.

Figure 8 Map of assessment area showing HCV 3

Intact Forest Vegetation and swamp forest

Two forest patches are contained in the assessment area. These are the forest fragments at the B13/B14 blocks as well as A21-24 block. The forest patch at B13/14 is only a few hectares and quite degraded by current laterite collectionfor road-building. However, the swamp forest at the 'A' block, though degraded, is a relatively significant remaining forest fragments and is constituted as a small forest patch located in the north-eastern corner of the concession. While it has been selectively logged in the past, it still retains variable, closed canopy in some areas (although several of the large emergent canopy trees have been removed).

5.3.1 Discussion and justification

There are a number of swamps scattered in various blocks in the wider Extension I landscape, with two present in within the assessment area. These are the small swamp in the rubber plantation and the much larger freshwater swamp forest located at northeastern corner of the Extension I Concession, contained in the A21-24 Block. Swampland ecosystems are increasingly becoming rare at various scales due largely to drainage for agriculture and other purposes, and constitute a highly threatened habitat type. The swamp forest at A21-24 is apparently the only remaining comparatively less disturbed vegetation in the Extension I concession that provides a refuge to a variety of wildlife species (mostly birds) as was evident from the results of the fauna survey carried out during this assessment. Predictably, this zone had the highest abundance and diversity of species of conservation interest, compared to elsewhere in the assessment area. Results from the faunal survey show that all the species of conservation interest found here are 'forest zone' species, adapted to a forested environment. However, the fact that none are exclusively dependent on primary or mature forest provides a strong additional basis to protect remnant wildlife in (disturbed) forest patches such as this swamp forest.

Given 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.

HCV 3 is thus confirmed to be present in the concession. The total area of this wet forest fragment and the small swamp in the rubber plantation (conversion area) is approximately **200 ha**.

There are indications from OOPC that the swamp forest (like all other swamps in its plantation areas) is planned to be left free of conversion. This is strongly recommended as this assessment firmly establishes the area as HCV 3.

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

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
Ecosyst includir vulnera	Tem services. Basic ecosystem services in critical situations, ng protection of water catchments and control of erosion of ble soils and slopes.	PRESENT

5.4.1 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, 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:

- There are no viable, readily available or affordable alternatives, or
- The loss/damage to an ecosystem service could cause serious prejudice/suffering to recipients either immediately or periodically.³

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

Protect watersheds, regulate streamflow and prevent potentially catastrophic floods,

³ Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.). 2013 (October). Common guidance for the identification of High Conservation Values. HCV Resource Network.

- 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 dryland areas particularly susceptible to erosion and desertification

5.4.2 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 areas' low-lying topography. For example, elevation at the Extension 1 ranges between 12-104 m with a mean of 67 m above sea level.

Prevention of spread of fires

Similarly, the risk of destructive wildfires is virtually non-existent in the area. Extension I is located in a moist rainforest zone 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 concession 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, helping 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 nutrient loading of streams which will result in a marked decrease in the quality of the water bodies. By supporting aquifer recharge and maintaining stream flow, the riparian vegetation also ensures water quantity (and quality) is maintained.

Therefore, the fresh water swamp forest at A21-24 Block (described above) and the riparian zone through A31-33, as well as the vegetation along the stretch of the Erudu River and Umalegidi Creek play a crucial role in supporting and regulating ecosystem services including flood regulation/buffering and water purification. Additionally, the swamp forest serves as the source of the Erudu River or Umalegidi Creek which flows southwards along most of the eastern boundary of the concession and is an important source of water for some downstream communities. During the community consultations,



The Erudu stream is the source of drinking water for the Deola Camp

it was revealed at the Deola Camp that the Erudu River or Umalegidi Creek is the singular source of drinking water for that community.

No other rivers or water catchments exist in the assessment area. The Arakhuan River (outside the assessment area) flows through the south of the concession and serves as complementary source of drinking water to some downstream communities.



Figure 9: Map showing HCV 4 showing the swamp forest and the Erudu River.

The swamp area is a rare ecosystem which provides refuge for wildlife, especially birds, and also provides water catchment services in maintaining water quality of the Erudu River or Umalegidi Creek on which some communities depend for water. Riparian vegetation protects water quality by trapping sediments and pollutants associated with run-off, helping recharge underground aquifers among others. As noted earlier, there are indications from OOPC that the swamp forest is planned to be left free of conversion. In view of the foregoing, the freshwater swamp forest at the A-block (already identified as HCV 3) and the Erudu River or Umalegidi Creek together with the riparian vegetation along the River are confirmed to be HCV 4.

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

Definition

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

HCV	Key question	Finding
5	Does the Okomu Extension 1 concession contain areas that are fundamental to meeting the basic livelihood needs of the local communities, e.g. (subsistence, health etc)?	Present

5.5.1 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 include areas that are of essential importance for local communities as substantial and irreplaceable sources of food, medicines, fuel, <u>household water</u> and other basic needs. Where these goods and services are localised 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

Water resources and fisheries

All the communities living close to the river catch fish from it to supplement household protein from other sources (e.g. domestic poultry and livestock, and fish/meat bought from the local markets). However, alternative sources of protein (domestic poultry and livestock, bushmeat and meat bought from the local market) are prevalent and therefore not fundamental to meeting basic needs and livelihoods of the local communities.

As noted earlier, in addition to its crucial role in supporting and regulating critical ecosystem services, the Erudu River or Umalegidi creek is a critical source of drinking water for some downstream communities. HCV 5 areas include areas that are of essential importance for local communities as irreplaceable sources of basic needs including household water. Given that the singular source of drinking water for the Deola Camp community is the Erudu River, it is confirmed to be HCV 5 (and therefore overlapping with HCV 4).

Hunting

Hunting remains an important source of protein but virtually all hunting is done outside the Concession. The forest patches at the 'A' and 'B' blocks are evidently encroached for hunting but this is considered not to be an indispensable source of protein and/or livelihoods. Local hunters also indicated that the species of animals they hunt are dispersed throughout the landscape, and that there is no particular spot in the area where these species are concentrated.

Gathering of food, medicines and construction materials

It was revealed during public meetings and focus group discussions that certain leaves and herbs are collected from nearby bushes. However, 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 concession. 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 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. With the exception of the marshy natural vegetation at the 'A' block which is the site for limited collection of poles and illegal chainsaw operations, the concession is not a source of poles and timber for nearby communities.

Logging and chainsaw operations

Harvesting and sale of timber (mostly illegal) is a source of income for most people in the communities consulted, but these appear to be targeted at the ONP. These are used for local construction but largely for sale to generate income. There is a ready market for timber given proximity of the area to big towns such as Udo and Benin City.

Farmland

The communities around the concession areas are predominantly agrarian and a number of the local people have encroached the 'A' block and operating illegal farms. Results from the community consultations indicated that due to the difficult nature of the terrain, most of those farming there also have farms in other locations.



The 'Life Tree' at the assessment site is protected by a fence wall.

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

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 serving as the *home to deities or ancestors*.

HCV	Key question	Finding
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

5.6.1 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 concession as confirmed from stakeholder interviews and extensive literature search.

Sites of local cultural/traditional or religious importance

These areas are also known as sacred groves in some countries. In Nigeria, some patches of forest/natural vegetation may be considered as 'evil' 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 killed or disturbed,
- 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.

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5.6.2 Discussion and justification

Five (all settler camps) out of the eleven communities surveyed indicated not to have shrines or sacred sites in their community or the concession. All but one of the remainder's occurred outside the assessment areas, with the exception being one of the shrines of the Udo community – the 'Life Tree' (Newbouldia laevis) – located just inside the assessment area, within the precincts of the workers' estate. The shrine is currently contained in – and protected by – a short fence but its presence within the workers' abode and close to daily operations exposes it to the risk of possible destruction, **and is therefore confirmed as HCV 6.**

According to the Iyase of Udo, it 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.



Figure 10 Map showing HCV 6

5.7 Stakeholder consultations

A number of government officials and experts were interviewed to share any comments and/or concerns they may have in respect of OOPC's plantation development efforts in general and specific matters relating to HCVs. Table 7 below summarises outcomes from stakeholder consultations.

Table 6: Outcome of stakeholder consultations			
Name of Stakeholder	Date of consultation	Comments/concerns raised	Assessors response
Mr Friday Oriakhi Director of Forestry	23 rd Oct 2015	No specific comments on Extension I.	No response.
Mr M. I. Anogie, Director of Agriculture Services, Ministry of Agriculture and Dr Albagun	23rd Oct 2015	Mr Anogie indicated that the Ministry has no issue with Okomu operating on the land apart expecting that the company operates responsibly, respecting workers and communities' rights.	Okomu intends to certify its operations so it is expected that social issues will be taken seriously.
Mrs Itohan Obayagbona (Permanent	23rd Oct 2015	The Permanent Secretary for Agriculture emphasised that her outfit expects Okomu to be environmentally and socially responsible. The Permanent Secretary requested for information on RSPO.	Information on RSPO including website were provided.

Secretary)			
Ruth Akagu, Technical Coordinator, Nigeria Conservation Foundation (NCF)	27 th Oct 2015	NCF (a renowned NGO) previously carried out a lot of work at the ONP which is an IBA. Aware that the Extension I area is largely degraded but patches of some healthy ecosystems remain that should be the focus of the on-going assessment.	Field work is currently on-gong and all natural vegetation areas within the scope will be assessed.
Chima Williams, Environmental Rights Action (ERA).	23 rd October, 2015	According to the ERA (also known as Friends of the Earth-Nigeria), no issues have been brought to its attention concerning the development at Extension I in general and the assessment areas in particular. However, the staff noted that oil palm development in general is associated with negative social and environmental impacts which according to her, Okomu needs to carefully manage for all its plantations.	Explained that the HCV assessment is being undertaken in the context of RSPO which outlines a framework for responsible development of oil palm.
Ohiwerei Jonathan, HOD Budge, Planning, Research and Statistics, Ovia SW LGA.	21 st October 2015	The Ovia South-West Local Government Area is implementing the strategy document: Local Economy Empowerment Development Strategy. This strategic framework document is aimed among others at improving the social infrastructure of all towns and villages in the medium to long term. All companies supporting local communities in their areas of operation as part of their Corporate Social Responsibility are expected to align their planning with this document. Requested to know why the company was carrying out this assessment.	Explained that this assessment was being done in the context of RSPO certification which requires that oil palm development precludes conversion and development of areas containing HCVs among others.



Consultations at Gbele-Oba community.

5.7.1 Community consultations

Results from the baseline social/socio-economic survey carried out by ERM and FDA have been complemented with broad community-level consultations carried out during the fieldwork. Public meetings were held in all eleven (11) communities involving a crosssection of all stakeholder groups including the Odionwere and his elders, women, farmers, fishermen, hunters and other identifiable groups.

Several concerns were raised by communities including increasing scarcity of land for farming, pollution of water bodies, absence and/or poor condition of social amenities (schools, clinics, good roads, etc.) among others. All issues and concerns raised have been addressed to the extent possible. Outcomes from the community consultations (including issues raised and how they have been addressed) are detailed in Annex 2.

5.7.2 Participatory Mapping

Where there was indication that local communities use resources from the assessment area, participatory mapping was done to determine nature and distribution of utilised resources. Participatory mapping was done in **seven out of eleven** communities surveyed. The approach was to present a map of the area and ask participants of FGDs or wider community meetings to indicate the location of the particular resource mentioned. Even though only one indicated that it had a 'shrine' within the concession. Several other communities relied on the Arakhuan and Erudu streams to complement their drinking water sources, while a number of farmers in some communities indicated that they have farms in the 'A' block of Extension I. See Table 5 below summarises outcomes from participatory mapping.

Name of	Name of Local	GPS	Estimated	Meeting	Participatory mapping (Yes/No) and
community	Government	Coordinate	population	attendance	summary of outcome
Hassan Camp	Ovia South	N06.31608	1630 ⁴	20	Yes]: Critical dependence on Arakhuan
	West LGA	E005.36138			Stream which originates at the Okomu
					National Park and flows through Ext. I.
Evboiruebor	Ovia South	N06.30461	No data	12	[Yes]: Erudu River is a source of drinking
	West LGA	E005.38185	(350)		water.
Igbinoba	Ovia South	N06.28942	No data	32	[Yes]: Depend on Gbole-Uba creek for
	West LGA	E005.38811	(7000)		water. Have farms at 'A' Block.
Adeola	Ovia South	N06.31866	No data	07	[Yes]: Critical dependence on Erudu
	West LGA	E005.39120			River which flows from the 'A' Block.
Opuama	Ovia South	N06.35058	No data	22	Have farms at the 'A' Block.
	West LGA	E005.42890			
Bisi Camp	Ovia South	N06.29516	No data	23	[Yes]: Have farms at 'A' Block. Depend
	West LGA	E005.36975			on a spring in community for drinking water.
Udo	Ovia South	N06.47675	No data	05	[Yes]: Shrine at assessment site.
	West LGA	E005.35517			
Madagbayo	Ovia South	N06.41066	No data	38	[No]: No use of resources from
	West LGA	E005.11112			assessment site.
Gbelebu	Ovia South	N06,39352	No data	30	[No]: No use of resources from
	West LGA	E005.10374			assessment site.
AT&P	Ovia South	N06.39639	No data	03	[No]: No use of resources from
	West LGA	E005.28307			assessment site.
Nikrowa	Ovia South		No data	04	[No]: No use of resources from
	West LGA				assessment site.

Table 7: Summary outcomes from participatory mapping and consultation record

6 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 concession. The section also provides monitoring recommendations which Okomu is expected to adopt for evaluating the effectiveness of the HCV management recommendations over time.

⁴ Socio-economic survey report by ERM and Foremost, November 2010.

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. Table 8 below details threats to identified HCVs.

Table 8: Threats to identified HCVs in the concession

HCV	Brief description of value present in assessment area	Main threats
3	Rare, threatened or endangered ecosystems: The small swamp in the rubber conversion area and the much larger swamp forest located at the 'A' Block in the north- eastern corner of the Extension I Concession.	Conversion to farmland Consultations at the various communities visited revealed that a number of people currently farm in some parts of the swamp forest. Subsequent field visit to the area confirmed the presence of farms. Only limited incursion into the swampland was possible during the site visit, and therefore difficult to gauge the extent of farmlands as further access into the swamp was difficult due to the terrain. However, the spread and prevalence of farms as far as the eye could see was evident. Agricultural encroachment and clearing which goes right to the edge of rivers and waterways expose stream banks to the vulnerability of erosion and could potentially result in erosion. Sedimentation caused by erosion and pollution from agro-chemical run-off can threaten the services provided by HCV 4 rivers and streams. There is no external threat to the small site with the rubber conversion site as it is contained well within the concession; and possibly no internal threat of conversion as well. The reason is that this swamp continues to be present and in good state despite surrounding ongoing operations. However, the risk posed by any planned clearance cannot be overlooked and therefore, management is strongly advised to ensure the continued integrity of
		the swamp through clearance for palm development. Plantation agrochemical use Both swamp sites could be at risk of pollution by agro-chemicals, but the threat and impact levels vary due largely to their size, location and functions among others. The forest swamp is bounded to the west and south by two blocks of young rubber plantations and represent the sources of agrochemical threat, but both are separated from the swamp forest by roads. The small swamp would occur within the planned oil palm development in the future and therefore susceptible to potential pollution – and destruction of aquatic biota – by agrochemicals seeping from nearby stands. Illegal timber harvesting Interviews with stakeholders revealed that some measure of logging occurs in the swamp forest at certain times of the year, particularly by chainsaw operators from both nearby and distant communities. Logging poses a major threat to the

continued provision of critical ecosystem services of the swamp forest. This

would reduce the capacity of the swamp to moderate stream flow, stabilize the terrain, reduce river bank erosion, regulate runoff, trap sediments and promote infiltration of sediment-borne nutrients and pesticides. This would affect the water quality of water in major rivers and streams such as the Erudu or Umalegidi Creek that drain the concession.

Conversion during plantation land preparation and road building

Illegal timber harvesting and unsustainable collection

The small swamp located within rubber plantation to be converted to oil palm stands at risk of being converted during land preparation. This could prove consequential for stabilization of terrain and adversely affect the potential to promote infiltration of sediment-borne nutrients and pesticides.

4 & Ecosystem services including:

- 5 Critical water catchment areas required to maintain continuous flow of water to serve local communities including the swamp forest at the 'A' Block in the north-eastern portion of the Extension I Concession.
 - Riparian vegetation protecting water bodies against erosion, maintaining water quality of rivers and streams including the Erudu River or Umalegidi Stream.
- 6 Areas critical to local communities' traditional cultural identity:
 - The shrine (Life Tree) at workers' estate.

Interviews with stakeholders revealed that some measure of logging occurs in the swamp forest at certain times of the year, particularly by chainsaw operators from both nearby and distant communities. Logging poses a major threat to the continued provision of critical ecosystem services of the swamp forest. This would reduce the capacity of the swamp to moderate stream flow, stabilize the terrain, reduce river bank erosion, regulate runoff, trap sediments and promote infiltration of sediment-borne nutrients and pesticides. This would affect the water quality of water in major rivers and streams such as the Erudu or Umalegidi Creek that drain the concession.

At present, there appears to be no threat to the shrine as it is well contained within a block fence 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.
 However, unsuspecting persons'/company visitors may act in ways around the shrine that could prove offensive to the traditional authorities and for this reason, it may be useful for the company to implement proactive additional measures to maintain the integrity of the shrine. This could include raising notification and/or warning sign-posts such as 'do not urinate here!!', etc.

6.2 HCV Management Recommendations

This section presents recommendations for managing the identified high conservation values in the concession.

Table 9 below provides an outline of HCV management and monitoring recommendations that Okomu must adopt and implement.

	Та	ble 9: HCV management recommendations	
HCV ref	Threats	Management recommendations	Monitoring recommendations
3	 Conversion of the swamp forest Cutting of trees in the swamp forest Pollution of the swamp 	 Exclude the swamp forest from all conversion activities. No land-use activates must allowed in the swamp forest, and the road boundary separating it from the existing plantation should be visibly maintained at all times. The existing buffer just after the road should be enriched with native tree species. Prepare appropriate SOPs for effective management of the swamp forest. Erection of no hunting or logging sign posts within the vicinity and sensitization of communities of the ecological and livelihood importance of the swamp forest. 	 Regular monitoring of the swamp forest areas Avoid application of agrochemicals within the swamp forest buffer zone Review of effectiveness of SOPs at least yearly
4 & 5	 Loss of riparian forest during land clearing Loss of water quality and quantity due to conversion of watersheds and riparian vegetation Loss of potable water supply downstream Pollution from agrochemical use 	 Prepare SOPs that recognise all set-aside areas including riparian vegetation, watersheds and gallery forest areas and ensure those areas are precluded from conversion activities Buffering of all rivers and streams. Setaside buffer of 50m on each side of the Erudu River or Umalegidi Creek at all flow locations within the Concession and 20 m for all other smaller rivers and streams. All other watershed areas identified must be precluded from conversion activities (Chappel et. al., 2007). 	 Regular sampling from rivers and streams for testing, including control/impact water quality monitoring system (before and after). Regular monitoring of riparian vegetation, watersheds and gallery forest areas Avoid application of agrochemicals in riparian vegetation and watershed areas Review of effectiveness of SOPs at least yearly
6	Clearing of sacred and shrine sites	• Okomu to prepare SOPs that includes HCV 6 areas in the plantation will be managed	A simplified HCV monitoring system/protocols in collaboration with the local communities

7 Synthesis

7.1 HCV management areas

HCV 3: The circa. 250 ha of natural vegetation in the north-eastern portion of the concession is recommended to be set-aside to support the continued services provided by the swamp forest it contains. Additionally, a buffer of 20m is recommended to be maintained around the small swamp (of approx. 1ha) in the planned conversion area.

HCV 4: A buffer of 50m either side of the river is recommended to be maintained along the stretch of the Erudu stream (wherever it occurs in- or intersects with – the boundary). A buffer of 20 m is recommended on either side of smaller rivers and streams.

HCV 6: The existing fence wall around the 'Live Tree' defines the area to be maintained for this HCV.



Figure 11 Map showing HCV management areas

7.2 Cross-cutting management recommendations

SOPs 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.

Community engagement

As was evident during the community consultations, there is enormous scope for improvement in frequency and scope of community engagement by Okomu. Not all communities are targeted by the CLO's engagement efforts and the few who are complained that visits were few and far between. Of arguably greater concern may be the fact that hardly any issues to do with HCVs or conservation in general are discussed at this meeting. There is therefore and urgent and important need to expand the scope of the agenda during such engagements to include efforts at fostering local community support and participation in HCV management and monitoring where applicable. In this regard, it could prove beneficial and constructive to look for ways to drive and incentivise local community participation.

Training and capacity building

Adequate capacity is required to ensure effective management and monitoring of HCV management areas with the objective to maintain and/or enhance all HCVs identified. The capacity to accurately capture geospatial data for subsequent analysis is crucially important, not least in the continued monitoring of the status of HCVs over time. The company's survey team demonstrated commendable knowledge of the assessment area and related features as well as capacity to use simple survey tools during the field work, but their capacity to use the GPS needs to be improved.

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9 Annexes

Annex 1: CVs of assessment team members

Abraham Baffoe

Current position: Associate Director, Proforest, UK since January 2010.

Qualifications: *MSc, Forestry and Environmental Economics*. Louisiana State University, Baton Rouge, USA. 2008-2009: Certification, Implications for Sustainable Forest Management and Timber Export Trade from Ghana (funded by the ITTO).

Postgraduate Certificate. Natural Resources Management Economics. Wegeningen University and Agricultural Centre, Netherlands, 2001

BSc Hons. Forestry. Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. 1996.

Expertise:

Forest ecology, biodiversity conservation, social forestry and hydrology: Extensive experience and knowledge on forest ecology, species identification and forest hydrology. Several years of experience in forest biodiversity assessment and monitoring including practical experience in managing watershed projects. Decades of experience working with local populations on sustainable management and use of community natural resources.

HCV: Have worked with HCVs since 2001. This has included leading tens of HCV assessments for forestry and agricultural commodity production companies in many countries Africa including Ghana, Liberia, Gabon, Nigeria, Zambia, Ethiopia and Ethiopia. Have also provided several HCV trainings since 2005 and a facilitator and co-author of the Ghana National Interpretation of the HCV Toolkit in 2006.

Sustainable agriculture and forestry: Over 18 years' experience with the environmental and social sustainability issues of which 13 years has been with the oil palm sector. Have extensive experience with the RSPO, having led several baseline assessments of oil palm operations against the RSPO standards and having been part of RSPO National Interpretations for Ghana.

Fieldwork: Over a decade of experience of fieldwork with the tropical rainforests of West Africa, having worked as the Afforestation Manager of a leading timber company in Ghana from 1996 and as the WWF West Africa Forest Programme Manager.

Nana Darko Cobbina

Current Position: Senior Project Manager, Proforest Ghana since January 2013.

Qualification: MSc. Environmental Resources Management, October 2011, College of Engineering, Kwame Nkrumah University of Science & Technology (K.N.U.S.T), Kumasi, Ghana

BSc. Natural Resources Management, July 2003, Institute of Renewable Natural Resources, K.N.U.S.T

Expertise: Social forestry, community development, forest management and biodiversity conservation.

HCV: Involved in HCV since 2006. Consultant in Ghana's National interpretation of the global HCVF toolkit. Has experience in undertaking (including providing management and monitoring recommendations) and evaluating (within the context of forest management certification) HCV assessments in Ghana, Liberia, Cameroon and Nigeria. Sustainable agriculture and forestry: Many years of Involvement in the implementation and monitoring of social and environmental aspects of sustainable palm oil and forestry production. Carried out numerous (over 20) FSC forest management assessments (since 2006) and several RSPO baseline assessments (since 2013) in Ghana, Liberia and Nigeria.

Fieldwork: Nearly a decade working leading and supporting the implementation of several biodiversity conservation projects (at Friends of the Earth, Care and Christian Aid) with a focus on social aspects and community involvement. Extensive experience in providing practical support to timber companies in Ghana to address social gaps in their efforts to achieve FSC certification.

Dr Emmanuel Danquah

Current position:

Head of Department and Senior Lecturer/Ecologist at the Department of Wildlife and Range Management, FRNR, KNUST

Qualifications:

PhD Wildlife and Range Management, KNUST, Ghana 2012 MPhil Wildlife and Range Management, KNUST, Ghana 2003 BSc Hons. Zoology; Dip Education, UCC, Ghana 1997

Expertise:

Interdisciplinary background with extensive experience in biodiversity assessments in HCVs and natural resources management since 2005. Focal project countries in Africa are Ghana, Cote d'Ivoire, Burkina Faso, Togo, Liberia, Guinea, Sierra Leone, Senegal, Gambia, Nigeria, Cameroun, Kenya and Uganda. Recent areas of research include biodiversity monitoring in HCV assessments of oil palm, rubber and teak plantations; environmental impact assessments of natural resource-based projects; green economies in biosphere reserves; endangered species management; protected areas governance; indigenous people and conservation, and traditional knowledge in natural resource management. Has over 25 peer reviewed papers to his credit.

Membership:

Member of the International Union for Conservation of Nature (IUCN) - World Commission on Protected Areas (WCPA), IUCN Species Survival Commission (SSC) - African Elephant Specialist Group (AfESG), IUCN World Commission on Biodiversity and Protected Areas Management (BIOPAMA), International Union of Forest Research Organizations (IUFRO) -International Council from Africa Region (Ghana), United Nations Educational, Scientific and Cultural Organization (UNESCO) - Man and Biosphere (MAB) National Committee of Ghana (AfriMAB), Society for Conservation Biology (SCB), American Society of Mammalogists (ASM) and the Ghana Institute of Professional Foresters (GIPF).

Dr. Armand Yevide Sedami

Armand's background is in agronomy, natural resources management especially ecology, forestry and agroforestry, in species distribution modelling under climate change scenarios, in long-term ecosystem monitoring, and in social network analysis. He has worked as consultant for the "Institut National de la Statistique et de l'Analyse Economique (INSAE)" on the dynamic of cash crop chains (Cashew, Sugar cane, Pineapple and Tabaco) in Benin. Additionally, he has more than 5 years of experience teaching undergraduate students in many private and public universities in Benin.

Armand holds a PhD in Natural Resources Management and spent about 2 years as post doctor at the Institute of Remote Sensing and Digital Earth (RADI) working for the United Nations Environment Programme-International Ecosystem Management Partnership (UNEP-IEMP) under the Chinese Academy of Science's International Young Scientist Programme. He has a number of scientific publication on the ecology, dynamic, productivity and tree growth modelling of natural and man-made forests, ethnobotany, biodiversity and ecosystem monitoring network with a special focus on Africa. Armand is fluent in French and English, and has basic communication skill in Chinese. He is currently a Project Manager in the Proforest Africa regional office.

Joseph Ugbe

Current position: Higher Forest Superintendent, Cross River State Forestry Commission. January 2008 to date.

Qualifications: MSc. Forestry Economics and Management, 2014

B.Sc. Forest (Hons) Forestry and Wildlife Resources Management, 2011

BSc. Natural Resources Management. Kwame Nkrumah University of Science and Technology, Ghana. 2001-2005.

Expertise

Forest and wildlife assessment: Joseph has several years of experience working with the Cross River State Forestry Commission (CRSFC). He has more than 10 years of experience working as the research expert in both wildlife and plants with special focus on aquatic species. For this assessment, Joseph worked with the flora survey team while being responsible for assessing the herpetofauna in the concessions. HCV: Joseph has participated in several HCV assessment undertaken by Proforest in the

Nigeria including in Edo and Cross River States. He has also participated in two HCV trainings conducted by Proforest.

Akomaye Ashikem

Current position: Forest Officer, Cross River State Forestry Commission

Qualifications: Diploma in Forestry, 1998.

Expertise

Forest inventory: Ashikem has several years of experience working with the Cross River State Forestry Commission (CRSFC) as Forest Officer responsible for forest inventories. He has more than 10 years of experience in biodiversity assessment especially in monitoring economically valued tree species in the forests of Cross River State. For this assessment, Ashikem was responsible for conducting an inventory of plants in the assessment area.

HCV: Ashikem has participated in several HCV assessment undertaken by Proforest in the Nigeria including in Edo and Cross River States. He has also participated in two HCV trainings conducted by Proforest.

Annex 2: Summary of communities' consultation

Community/ stakeholder	No. of person attended	Discussion on potential HCVs, concerns and questions	Assessors response
Hassan	20	At first, community was hesitant to start the discussion and questioned why Okomu should come and talk to them when a court case between the two	On the question of the disputed land area, the Assessor explained that the

parties in relation to the land area south of the

Arakhuan was on-going. Meeting proceeded following

area in question (south of the

Arakhuan River) was not

explanation by Assessor. within the scope of the HCV Reliance on Arakhuan for drinking but dries up in the assessment. Participants were dry season. On-going farming activities at the 'A' shown a map of Extension I and the HCV assessment area block. No electricity, school, market or health centre. was indicated. Further Mainly subsistence and commercial food crop farmers explained to participants that growing (cocoa, plantain, cassava, orange, cola, yam, cocoyam, pepper, potatoes, pineapple and sell it was important during the HCV assessment to engage produce in Lagos and other distant markets. No with all communities within sacred site. the landscape to investigate HCVs 4, 5 and 6 (which were further explained). Evboiruebor 12 Community was very grateful to Okomu for the Explained that the CLO would borehole and other assistance provided. Expressed follow-up all questions and concern over destruction of farms in the converted concerns raised in relation to portions of the southern part of the Concession, and compensation but also noted noted that some farmers in the community were yet that the assessment team had to receive compensation. Indicated that the Erudu not as yet fully reviewed the River complements as drinking water source and used extensive available records on for transportation (to surrounding communities) as compensation by Okomu. well since there are hardly no roads and the available few are un-motorable roads. Bemoaned the fact that they have to travel to Udo and Igbinoba to attend clinic and school respectively. Closest market is at Udo and Ikoro. Herbs harvested in and around community except around the shrine area. Hunting and fishing using traps, hook and nets. Hunted animals include antelopes, porcupines, rabbits, deer, grass-cutter and bush pig. Sacred site (Osun) within community used as a healing centre and not accessible to everyone including child-bearing women. Igbinoba 32 Community was grateful to Okomu for all the Tried to explain that Okomu assistance it provides but asked for more Security might be acting in development including roads, school expansion, accordance with instructions boreholes and particularly employment of the youth. to ensure that motor bike A major concern expressed was the harassment by riders and their passengers Okomu security anytime they have to move through travel safely through their the plantation. Source of water is Gbole-Uba creek estates and also to avoid fatal which is also serves fishing and transportation needs accidents. and flows down to Nikrowa. Reliance on surrounding herbs but have to travel to Benin for hospital. No market (Ikoro) but school by government and OOPC. Farming and fishing with farms at A block. Amabotu shrine for spiritual consultation and prayers to address calamitous situation - celebrated during

Feb/Mar.

		No official population figures for all communities.	
Adeola	07	Their major concern is the pollution of the stream flowing behind the community by run-off water from very close rubber block at B82. According to them, they are migrant Yoruba community under the Igbinoba community. Previously at Olomu but had to re-locate upon development of the area into a rubber plantation. Have been at their current location for 2 years now after 16 years at Olomu. Claimed to have only received partial compensation because Okomu only paid for houses and not crops. Source of water is Erudu. Extremely concerned about pollution of stream from run-off water from nearby rubber plantation block. Largely cash crop (cola, cocoa) farmers. No clinic, school. Purchase meat from Igbinoba. No sacred sites. Concern over destruction of farms in the southern portion of the concession with assertions that farmers are yet to receive compensation. Adeola Camp claimed to have received partial compensation as OOPC paid for houses and not farms.	According to Okomu, the community is 'a new one' which did not exist at the time of the ESIA and indicated that water samples are to be taken before and after passage through the plantation to monitor quality. Okomu maintains records of compensation payments in respect of its operations including Extension 1.
Opuama	22	Generally happy with Okomu since some development projects have been completed and some are in the pipeline. Borehole complemented by Awien/Umalegidi creek stream flowing just behind community. Cash and food crop farmers. No school, clinic or market. Relatively more intense timber harvesting. No sacred site.	No comment.
Madagbayo	38	Multiple boreholes plus Rivers Oha (which lies at boundary between Ondo and Edo) and Ovbieze. Has health centre, school and market, all of which have been provided by Okomu. Concerned that roads are not being graded and for improved access to their farms and to the City. Mostly buy meat but some hunting and fishing. Concern about increasing population pressure on land. 5 sacred sites (all within community) including Ikperegun (stream), Leron (shrine), Okuta (shrine), Orhomu (shrine) and Ovbieze (stream).	When asked their view of the concern by communities of reducing availability of land for agriculture due to population pressure, officials of the state agriculture and forestry offices indicated that this was inevitable and common in most of southern Nigeria. They noted the policy to give out degraded forest areas for
Gbelebu	30	Community indicated that there is increasing population pressure on land resources with lesser and lesser areas being available for farmland. Enquired about whether Okomu's appetite for land for new plantations. 20 boreholes. River Oha for transportation of produce to Lagos. A number of small streams (used particularly by several small camps)	Taungya farming but bemoaned the fact that this has achieved less than desirable outcomes. Ultimately, they reckoned that farming practices need to be improved through among others a shift from extensive

		including BiniBein which flows into R. Oha. Primary and secondary schools. Farming, fishing and hunting. 4 sacred sites including Egbisu, Ugbenu, Oligaraji and Ogun shrines (all within community and faraway from assessment site with virtually no risk from operations at Extension 1).	to intensive agriculture. It is however instructive to note that no agricultural lands are planned to be converted in the areas being assessed.
AT&P	03	AT&P river flows from Udo to Madagbayo – community situated inside Main Estate. Primary school and market but no clinic. Settler community under Udo. No sacred sites.	
Bisi Camp	23	Their biggest concern is the lack of basic infrastructure including water and sanitary facilities, noting that 'nobody' minds them: be it the LGA or Okomu. They further complained of unceasing harassment by the Okomu security for not ensuring motor riders and their passengers are always in helmet when they pass through the plantation. Nameless stream (Bisi stream) is source of drinking water. Source is at location. No clinic, school or market. Purchase meat from nearby communities. No sacred site.	
Udo	05	Ivase noted that there has always been cordial relations between Udo and Okomu but that this could be significantly improved, particularly between himself and Okomu top management to ensure that the good relationship becomes even stronger. He bemoaned fact the development had slowed down over the last few years. Concerned about growing scarcity of land for agriculture and hunting as a result of expanding plantation operations. Life tree (which according to lyase, symbolises land ownership) is planted at specific locations in new settlements and tended by the Odionwere. A One Life tree at both Main Estate and Extension I. Previously existing sacred streams have been lost with destruction of forest.	
Nikrowa	04	Several streams and boreholes. Ovia River for transportation to GeleGele, Ikoro, Ikenwa. Relatively good infrastructure (several development projects by OOPC) but extremely poor access roads and no electricity. Shrine just outside the community.	It was explained that this was an independent exercise but they should channel all their grievances to the CLO.

Annex 3: HCV implementation plan

Legend	I		
Actions	s to be implemented:		
	Before conversion	During conversion	After planting

Objective	HCV ref	Action required	Timeline	Monitoring measures/expected results
Maintaining w	ater quality a	and the HCVs it supports		
Protection of swamp and riparian areas		Buffering of the swamp forest in the concession		Set aside buffer zones included in GIS database for the swamp forest and all other rivers and streams as HCVs 3 and 4
	3, 4 and 5	Accurate mapping of all HCVs 3, 4, and 6 and their management areas in the concession should be carried.		Availability of accurate maps of all HCVs management areas
		Designation of a responsible person for all " HCVs " to provide training and ensuring that field workers adhere to management recommendations for HCV areas		Availability of trained lead person for the protection and management of identified HCV management areas
Protection of swamp forests and riparian areas		Land preparation teams are trained to delineate appropriate buffer recommended in this report on both sides of all rivers and streams. Also trained to be able to avoid conversion of all identified gallery forests		Evidence of training and understanding of buffer zones and all set-aside areas management and monitoring recommendations and requirements. Buffer zones and gallery forests are in place and respected
	3, 4 and 5	Land preparation teams are provided with maps of areas identified as protected areas		
		Land preparation teams are trained to carry out land conversion laterally to buffer zones and gallery forest areas to avoid having it destroyed by falling trees and shrubs.		No or minimal impact on buffer zones and gallery forests
		Regular monitoring to ensure that buffer zones and gallery forests requirements are respected If buffer zones and gallery forests are not respected, corrective actions must be taken immediately		Corrective actions record

Objective	HCV ref	Action required	Timeline	Monitoring
				measures/expected results
Erosion		HCV or environmental management		Training records and proof
control		field team are trained to implement and		of application of required
		respect erosion control		measures
		recommendations		
		Conversion team/Road construction		Training records and
		team trained to implement erosion		application of measures in
	3 and 4	control measures		practice
		Cleared vegetation is windrowed		Evidence of windrowed in
		Road soak ways are built depending on		Frequency/slope
		downslope of road being constructed		riequency/slope
		Silt nits are built to avoid sediments		
		heing discharges into the marshy areas		
Monitoring of		Annual water quality testing for major		Test results
water quality		rivers and all other rivers that are		
water quality		sources of water for host communities		
		Regular meetings with the host		Minutes of meetings
	4 and 5	communities on control and prevention		Windles of meetings
		of water pollution		
		SOP in place for Corrective/Preventive		Documented SOP
		action to be taken in case of degradation		
		of water quality		
Respect and M	aintain local	populations basic needs		
Implementing		Sensitize staff and contractors on		SOP
Community		presence and location of Life Tree		
consultation	6	Erect sign posts to create alertness.		SOP
process		Engage Udo in joint monitoring		SOP, minutes of meetings
Monitoring		Regular (twice a year at the beginning of		Minutes of meetings
results		the project, minimum once a year after		
		relation with communities are		
		strengthened) evaluation of changes in		
		communities needs		
Conversion op	eration			
		Land conversion operations shall start		Records on starting dates
	Ν/Λ	during the dry season unless there are		for land preparation and all
		compelling reasons to do so during a		major operations
		rainy season		
		Land conversion should start away from		
	N/A	the protected areas and moving		
		gradually towards those areas		
Implement rec	ommendatio	n in the field		
		Designation of a responsible person for		
	N/A	monitoring the field implementations of		
		HCV management recommendations		

Annex 4: Flora survey data

(in separate attachment)

Annex 5: Faunal survey data

			Land-	use Type					
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
<u>PRIMATES</u>	<u>PRIMATES</u>								
Monkeys	Cercopithecoidea								
Lowe's (Mona) Monkey	Cercopithecus (mona) lowei	0	0	2	2	33.3	LC	I	2
White- throated Monkey	Cercopithecus erythrogaster	0	0	0	3	25.0	VU	Ι	1
Putty nose guenon	Cercopithecus nictitans	0	0	1	0	8.3	LC	Ι	2
Prosimians Demidoff's Galago	Strepsirhni Galagoides demidoff	0	0	4	0	33.3	LC	I	2
Number of signs		0	0	7	5				
Number of species		0	0	3	2				

			Land-	use Type					
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
<u>RODENTS</u> Squirrels	<u>RODENTIA</u> Sciuridae								
Striped Ground Squirrel	Xerus erythropus	2	1	0	0	4.2	LC	Ι	2
Red-leg Sun Squirrel	Heliosciurus rufobrachium	0	0	3	2	6.9	LC	Т	2
African Giant Squirrel	Protoxerus stangeri	0	0	2	1	4.2	LC	I	2
Anumalures Beecroft's Anumalure	Anumaluridae Anumalurus beecrofti	0	0	2	0	2.8	LC	I	2
Porcupines Brush-tail Porcupine	Hystricidae Atherurus africanus	0	0	1	11	16.7	LC	I	1
Cane Rats Marsh Cane Rat	Thryonomydae Thryonomys swinderianus	6	4	7	5	30.6	LC	I	2
Pouched Rats	Cricetomyinae								
Giant Gambian Rat	Cricetomys gambianus	3	5	10	7	34.7	LC	I	-
Number of signs		11	10	25	26				
Number of species		3	3	6	5				

		_	Land-use Type						
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
	<u>CARNIVORA</u> Horpostidao								
Slender Mongoose	Herpestes sanguinea	0	0	2	0	8.0	LC	I	2
Cusimanse	Crossarchus platycephalus	2	0	1	2	20.0	LC	I	2
Marsh Mongoose	Atilax paludinosus	1	0	1	4	24.0	LC	I	2
Genets and Civets	Viverridae								
Blotched Genet	Genetta servalina	1	0	2	1	16.0	LC	I	2
African Civet	Civettictis civetta	0	0	2	0	8.0	LC	I	2
African Palm Civets	Nandininae								
African Palm Civet	Nandinia binotata	2	0	1	0	12.0	LC	I	2
Scaly Ant- eaters	Pholidota								
Tree Pangolin	Manis tricuspis	0	0	3	0	12.0	NT	I	1
Number of signs		6	0	12	7				
Number of species		4	0	7	3				

			Land	-use Type					
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
<u>UNGULATES</u> Pigs Red River Hog	<u>UNGULATA</u> Suidae Potamochoerus porcus	0	0	2	12	42.4	LC	R	1
Bovids Bushbuck	Bovidae Tragelaphus scriptus	2	1	3	4	30.3	LC	к	2
Antelopes Maxwell's Duiker Black Duiker	Antelopinae Cephalophus maxwellii Cephalophus niger	0 0	0 0	4 2	3 0	21.2 6.1	LC LC	I	2 2
Number of signs Number of species		2 1	1	11 4	19 3				

			Land	-use Type					
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
<u>REPTILES</u>	<u>REPTILIA</u>								
Crocodiles	Crocodylidae								
Slender crocodile	Crocodylus cataphractus	0	0	0	3	4.8	DD	I	-
Dwarf crocodile	Osteolaemus tetraspis	0	0	0	5	8.1	VU	I	-
Tortoises	Testudinidae								
Serrate Hinge-back tortois	Kinixys erosa	0	0	3	3	9.7	LC	I	-
Monitors	Varanidae								
Nile Monitor	Varanus niloticus	0	0	0	11	17.7	LC	I	-
Snakes	Squamata								
Gaboon Viper	Bitis gabonica	0	0	2	0	3.2	DD	Ι	-
Green	Dendrospis viridio	2	0	0	0	3.2	LC	I	-
Forest Cobra	Naja melanoleuca	1	2	3	0	9.7	DD	I	-
Royal Python	Python regius	0	0	2	2	6.5	LC	Ι	-
Rock Python	Python sebae	0	0	1	0	1.6	LC	Ι	-
Continued on next page									

			Land	use Type)				
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
<u>AMPHIBIANS</u>	<u>AMPHIBIA</u>								
Toads	Bufonidae								
Toads	Amietophrynus maculatus	0	0	1	3	6.5	LC	Ι	-
Frogs	Anurans								
Crowned Bullfrog	Hoplobatrachus occipitalis	0	0	2	1	4.8	LC	I	-
Rusty forest	Leptopelis hyloides	0	0	0	2	3.2	LC	I.	-
Tree frog	Leptopelis spiritusnoctis	0	0	1	0	1.6	LC	I	-
Tree frog	Hyperolius sylvaticus	0	0	1	0	1.6	LC	I	-
Brown banana frog	Afrixalus dorsalis	0	0	0	3	4.8	LC	I	-
Boutry River frog	Phrynobatrachus calcaratus	0	0	2	0	3.2	LC	I	-
Western	Silurana	0	0	0	4	6.5	LC	I	-
African foam- nest tree frog	Chiromantis rufescens	0	0	0	2	3.2	LC	Ι	-
Number of									
signs		3	2	18	39				
Number of species		2	1	10	11				

			Land-u	use Type					
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
Birds of Prey	Accipitridae								
Palm-nut Vulture	Gypohierax angolensis	4	0	1	1	1.9	LC	I	1
Harrier Hawk	Polyboroides typus	0	0	1	0	0.3	LC	I	1
Shikra	Accipiter badus	0	0	2	1	1.0	LC	I	1
Western Little Sparrowhawk	Accipiter erythropus	0	0	1	0	0.3	LC	I	1
Black Sparrowhawk	Accipiter melanoleucus	0	0	3	1	1.3	LC	T	1
African Goshawk	Accipiter tachiro	0	0	1	2	1.0	LC	I	1
Long-tailed Hawk	Urotriorchis macrourus	0	0	1	0	0.3	LC	I	1
Cassin's Hawk Eagle	Spizaetus africanus	0	0	1	1	0.6	LC	I	1
Ayres' Hawk	Hieraaetus dubius	0	0	2	0	0.6	LC	Ι	1
Black Kite	Milvus migrans	3	1	0	2	1.9	LC	Ι	1
Guinea- fowls	Phasianidae								
Crested Guineafowl	Guttera pucherani	0	0	2	0	0.6	LC	Ι	-
Ahanta Francolin	Francolinus ahantensis	0	0	4	2	1.9	LC	I	-
Lily-trotters	Jacanidae Actophilornis								
Jacana	africana	0	0	0	2	0.6	LC	Ι	-
Finfoots	Heliornithidae								
African Finfoot	Podica senegalensis	0	0	0	3	1.0	LC	Ι	-
Continued on next page									

		Land-use Type							
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
Pigeons and Doves	Columbidae								
Green Fruit Pigeon	Treron calvus	0	0	3	1	1.3	LC	Ι	-
Tambourine Dove	Turtur tympanistria	0	0	2	0	0.6	LC	Ι	-
Blue- headed Dove	Turtur brehmeri	1	0	1	2	1.3	LC	I	-
Red-eyed Dove	Streptophelia semitorquata	0	0	4	0	1.3	LC	Т	-
spotted Wood Dove	Turtur afer	0	0	3	2	1.6	LC	1	-
Parrots	Psittacidao								
African Grey Parrot	Psittacus erithacus	0	0	6	0	1.9	VU	R	1
Turacos and Plantain- eaters	Musophagidae								
Green Turaco	Tauraco persa	0	0	3	0	1.0	LC	Ι	-
Yellow- billed Turaco	Tauraco macrorhynchus	0	0	2	1	1.0	LC	Ι	-
Plantain eater	Crinifer piscator	0	0	4	0	1.0	LC	I	-
Cuckoos &Coucals	Cuculidae								
Klaas Cuckoo	Chrysococcyx klaas	0	0	1	2	1.0	LC	I	-
Didric Cuckoo	Chrysococcyx caprius	0	0	2	1	1.0	LC	Ι	-
Yellowbill	Ceuthmochares aereus	0	0	1	0	0.3	LC	Ι	-
Senegal Coucal	Centropus senegalensis	4	3	4	2	4.2	LC	Ι	-
Continued on next page									

Land-use Type Relative Common Oil **IUCN** WCMC Decree **Scientific Name** Rubber Forest Riparian Density Name palm Status Status 11 (%) Swifts Apodidae Cassin's Neafrapus 2 3 0 0 LC I 1.6 Spinetail cassini African Cypsiurus 4 1 3 0 LC 2.6 I Palm Swift parvus European Apus apus 3 1 2 0 1.9 LC T Swift Bates' Swift Apus batesi 2 2 0 0 1.3 LC I Little African 3 Apus affinis 4 0 0 2.2 LC I Swift Kingfishers Alcedinidae Malachite Alcedo cristata 0 0 0 2 0.6 LC Kingfisher Shining Alcedo Blue 0 0 0 2 0.6 LC I quadribrachys Kingfisher Blue-breast Halcyon 0 0 0 3 1.0 LC I Kingfisher malimbica Giant Megaceryle 0 LC I 0 0 0.3 1 Kingfisher maxima Hornbills **Bucerotidae** Allied 0 3 Tockus fasciatus 0 LC 0 1.0 I Hornbill African grey 0 1 Tockus nasutus 0 2 1.0 LC T hornbill Piping **Bycanistes** 0 0 2 0 0.6 LC Т Hornbill fistulator Black-Ceratogymna 0 0 3 3 LC T casqued 1.9 atrata Hornbill White-crest Tropicranus 0 0 1 0 0.3 LC I Hornbill albocristatus Continued on next page

		Land-use Type							
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
Honeyguides	Indicatoridae								
Honeyguide	maculates	1	0	2	0	1.0	LC	I	-
Willcock's Honeyguide	Indicator willcocksi	0	0	2	0	0.6	LC	Ι	-
Lesser Honevauide	Indicator minor	4	2	1	3	3.2	LC	I	-
Lyre-tailed Honeyguide	Melichneutes robustus	0	0	4	0	1.3	LC	I	-
Weednesday	Disidas								
Grev	Mesonicos								
Woodpecker	goertae	0	0	4	0	1.3	LC		-
Cardinal Woodpecker	Dendropicos fuscescens	0	0	1	0	0.3	LC		-
Gabon Woodpecker	Dendropicos gabonensis	0	0	2	0	0.6	LC	I	-
Fire-bellied Woodpecker	Dendropicos	0	0	1	0	0.3	LC	Ι	-
Treedpeenter	pynnegaeter								
Wagtails and Pinits	Motacillidae								
African Pied	Motacilla	1	1	0	0	0.6	LC	I	-
Wagtaii Yellow Wagtail	aguimp Motacilla flava	3	0	0	0	1.0	LC	I	-
								-	
Bulbuls	Pycnonotidae								
Little Greenbul	Andropadus virens	2	0	1	0	1.0	LC	I	-
Little Grey Greenbul	Andropadus gracilis	1	0	0	1	0.6	LC	Ι	-
Simple Leaf- love	Chlorocichla simplex	0	1	3	0	1.3	LC	I	-
Continued on next page									

			Land	use Type	•				
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
Bulbuls	Pycnonotidae								
Swamp Palm Bulbul	Thescelocichla leucopleura	1	0	0	1	0.6	LC	I	-
Icterine Greenbul	Phyllastrephus icterinus	0	1	3	0	1.3	LC	Ι	-
Common Bulbul	Pycnonotus barbatus	3	5	1	3	3.8	LC	Ι	-
Sunbirds	Nectariniidae								
Little Green Sunbird	Nectarinia seimundi	0	0	2	0	0.6	LC	I -	-
Olive Sunbird	Nectarinia olivacea	1	0	0	1	0.6	LC		-
Blue- throated Sunbird	Nectarinia cyanolaema	0	0	1	0	0.3	LC	Ι	-
Buff-throated Sunbird	Nectarinia adelberti	0	1	0	4	1.6	LC	Ι	-
Olive-bellied Sunbird	Nectarinia chloropygius	1	0	1	2	1.3	LC	Ι	-
Johanna's Sunbird	Nectarinia johannae	0	0	0	2	0.6	LC	I	-
Superb Sunbird	Nectarinia superbus	0	1	1	0	0.6	LC	Ι	-
Green Sunbird	Anthreptes rectirostris	1	0	0	1	0.6	LC	I	-
Warblara	Culturidae								
warpiers	Sylviidae								
Apalis	Apalis sharpii	1	0	2	1	1.3	LC	Ι	-
Cameroptera	Cameroptera brachyura	0	1	0	1	0.6	LC	Ι	-
Olive-green Camaroptera	Camaroptera chloronota	1	0	4	2	2.2	LC	Ι	-
Rutous- crowned Eremomela	Eremomela badiceps	0	0	0	1	0.3	LC	Ι	-
Continued on next page									

			Land	-use Type	;				
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
Warblers	Sylviidae								
Green Crombec	Sylvietta virens	0	1	4	3	2.6	LC	Ι	-
Green Hylia	Hylia prasina	0	0	6	0	1.9	LC	Ι	-
Flycatchers	Muscicapidae								
Cassin's flycatcher	Muscicapa cassini	1	0	0	0	0.3	LC	Ι	-
Dusky-blue Flycatcher	Muscicapa comitata	0	0	2	1	1.0	LC	T	-
Olivaceous Flycatcher	Muscicapa olivascens	3	0	1	0	1.3	LC	Γ	-
Ussher's Flycatcher	Muscicapa ussheri	1	0	4	0	1.6	LC		-
Paradise Flycatcher	Tersphone viridis	0	0	5	2	2.2	LC	Ι	-
Common Wattle-eve	Platysteira cvanea	0	3	0	2	1.6	LC	I	-
Chestnut Wattle-eye	Dyaphorophyia castanea	1	0	2	0	1.0	LC	I	-
Weavers	Ploceidae								
Village Weaver	Ploceus cucullatus	3	1	0	0	1.3	LC	Ι	-
Grey Sparrow	Passer griseus	3	0	0	0	1.0	LC	I	-
Pin-tailed Whydah	Vidua macroura	2	2	0	0	1.3	LC	I	-
Black- throated Malimbe	Malimbus cassini	2	4	0	0	1.9	LC	Ι	-
Continued									
on next page									

Appendix 7 continued: Mean avifauna sign densities (per km) and relative abundance (%) for the various land-use types

			Land	-use Type)				
Common Name	Scientific Name	Oil palm	Rubber	Forest	Riparian	Relative Density (%)	IUCN Status	WCMC Status	Decree 11
Starlings Forest	Sturnidae								
Chestnut- wing Starling	Onychognathus fulgidus	0	0	2	0	0.6	LC	Ι	-
Splendid Glossy Starling	Lamprotornis splendidus	0	0	3	1	1.3	LC	I	-
Orioles	Oriolidae								
Black- headed Oriole	Oriolus brachyrhynchus	0	0	1	0	0.3	LC	T	-
Black- winged Oriole	Oriolus nigripennis	0	0	2	0	0.6	LC	I	-
Darters	Anhingidae								
African Darter	Anhinga rufa	0	0	0	1	0.3	LC	Ι	-
Number of signs Number of species		64	38	139	71				
		30	20	60	41				

Appendix 7 continued: Mean avifauna sign densities (per km) and relative abundance (%) for the various land-use types

