

RSPO NEW PLANTING PROCEDURES
Summary Report of ESIA, HCV Assessments
and Management Plan
Mouila Lot 3 Extension, Olam Palm Gabon

February 2017



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1. OVERVIEW AND BACKGROUND

Olam Palm Gabon, a subsidiary under Olam International Ltd. has been a member of the Roundtable for Sustainable Palm Oil (RSPO) since February 2011; all developments had completed the RSPO New Plantings Procedure (NPP).

Olam Palm Gabon (OPG) is managing a total area of 181,069 ha through a public-private partnership between the Government of Gabon (GoG) and Olam International. The total area covers 11,250 ha of plantation acquired from SIAT in July 2016¹ and 58,400 ha of schemed smallholder development project namely Sotrader Ndende under OPG's direct management. Out of 181,069 ha, 83,054 ha has been identified as High Conservation Values (HCV) and conservation area through the RSPO NPP process².

OPG has now acquired an extension (14,530 ha) to the Mouila Lot 3 concession located to the south of the city of Mouila, in the Ngounié Province, southern Gabon. (Figure 1)

Table 1: Total concession areas managed by Olam

Location	Total Area	HCV and Buffer Zones	Area for Plantation*
Awala	20,030	12,852	6,810
Mouila 1	35,354	18,324	16,000
Mouila Lot 2	31,969	17,920	11,573
Mouila Lot 3	24,066	6,680	17,000
Makouke	11,250	To be determined**	
Sotrader Ndende	58,400	27,278.5	30,000
Total	181,069	83,054.5	81,383

* Final planted areas may vary slightly from this figure, based on operational surveys and cultural "chance finds", other infrastructures such as roads, mill are not included in this table.

**NPP to be scheduled in 2018

The Mouila Lot 3 Extension concession would be the latest development in an area of the country which has been highlighted as the most suitable for oil palm cultivation in analyses by both the ANPN (Agence Nationale des parcs nationaux/ National Parks Authority) and WWF (World Wide Fund for Nature), based on criteria ranging from accessibility and infrastructure to favourable amounts of rainfall and a minimisation of biodiversity loss. These analyses both identify the "fingers" of grassland ecosystems associated with the Niari-Nyanga³ syncline as suitable for oil palm.

¹ Acquisition announcement <http://olamgroup.com/news/q3-2016/#sthash.TFmINZDA.dpbs>

² NPP documents <http://olamgroup.com/products-services/food-staples-packaged-foods/palm/faq-and-reports/>

³ <http://www.pangeaminerals.org/2013/07/28/3101/>

The extension concession is predominantly savannah grassland with forests restricted to riparian and gallery forest, all forest patches were identified as HCV 4 and should thus be conserved. A High Carbon Stock (HCS) assessment has been conducted based on HCS approach to map carbon stock of the area, vegetation is categorized into young regenerating forest (YRF), low density forest (LDF), medium density forest (MDF) and high density forest (HDF). It was assumed that YRF was equivalent to forest of $\geq 35\text{tC/ha}$ but less than 75tC/ha . And that LDF contained $\geq 75\text{tC/ha}$.

The site does not overlap with any national parks, The closest conservation areas are the national parks of Waka to the north and Moukalaba-Doudou to the west, both over 50 km away, and as such unlikely to be impacted by the planned activities.

The soils had been extensively surveyed and characterised in Ndendé and Mouila Lot 3 as part of the Environmental, Social Impacts Assessment (ESIA) following a two-pronged approach:

1. Desk based study of existing information on the soils of Gabon and in particular the Mouila Lot 3 extension area; and
2. Soil sampling and analysis of the six main soil types found within the concession area. **No peat** soil has been identified in the proposed area.

Table 2: Area statement for Mouila Lot 3 extension

<i>Activity</i>	<i>Area (ha)</i>
<i>Total concession</i>	14,530
<i>A.) HCV 1, 3, 4, 5 & 6 area</i>	9,466
<i>B.) Plantable area excluding (C)</i>	4,878
<i>C) Infrastructures and roads</i>	186

Notes to area table: All forest/ area with higher carbon stock will be set asides as part of HCV. All areas are approximate based on current assessments, and may change following further surveys and FPIC negotiations.

The concession is located approximately half way between the provincial towns of Mouila to the north and Ndendé to the south. Mouila is the provincial capital with approximately 23,000 inhabitants. The town of Ndendé currently counts just over 4,500 inhabitants, a population in decline as the rural exodus continues towards bigger towns and cities. The recent road development between Ndendé town and Mouila has made exchanges and movement of people easier, and consequently has increased the human influence on the area. With the exception of OPG and SOTRADER investments in the area there are no other significant industrial or development projects in close proximity.

Four villages have been identified within and around the concession as potentially impacted by the development project. One village (Iroungou) is located within the concession boundary and one is located on the concession border (Nanga). The villages of Mbadi and Mounighou are located in the vicinity of the project area (figure 2).

The main economic activities in the concession area are small-scale subsistence cultivation of food crops (e.g. yams, plantains, cassava), hunting, fishing and gathering of non-timber forest products (NTFPs) from the forest areas. As a rule, small scale agriculture is practiced at a maximum distance of 2 to 3 km

from a village, while hunting and fishing grounds can be much more distant. All village activities have been mapped and are presented in Section 3 with the participatory mapping results. Generally local communities rely heavily on the network of seasonal streams and permanent rivers for their water needs, including drinking water.

OPG has commissioned an independent regulatory Environmental and Social Impact Assessment (Terea Gabon) and High Conservation Value assessment (HCV, Proforest UK, led by David Hoyle ALS15008DH) as part of the requirements of the RSPO for the development of new plantings for Lot 3 extension area. No development has started in the proposed area and verification by an accredited certification body was conducted in Oct 2016.

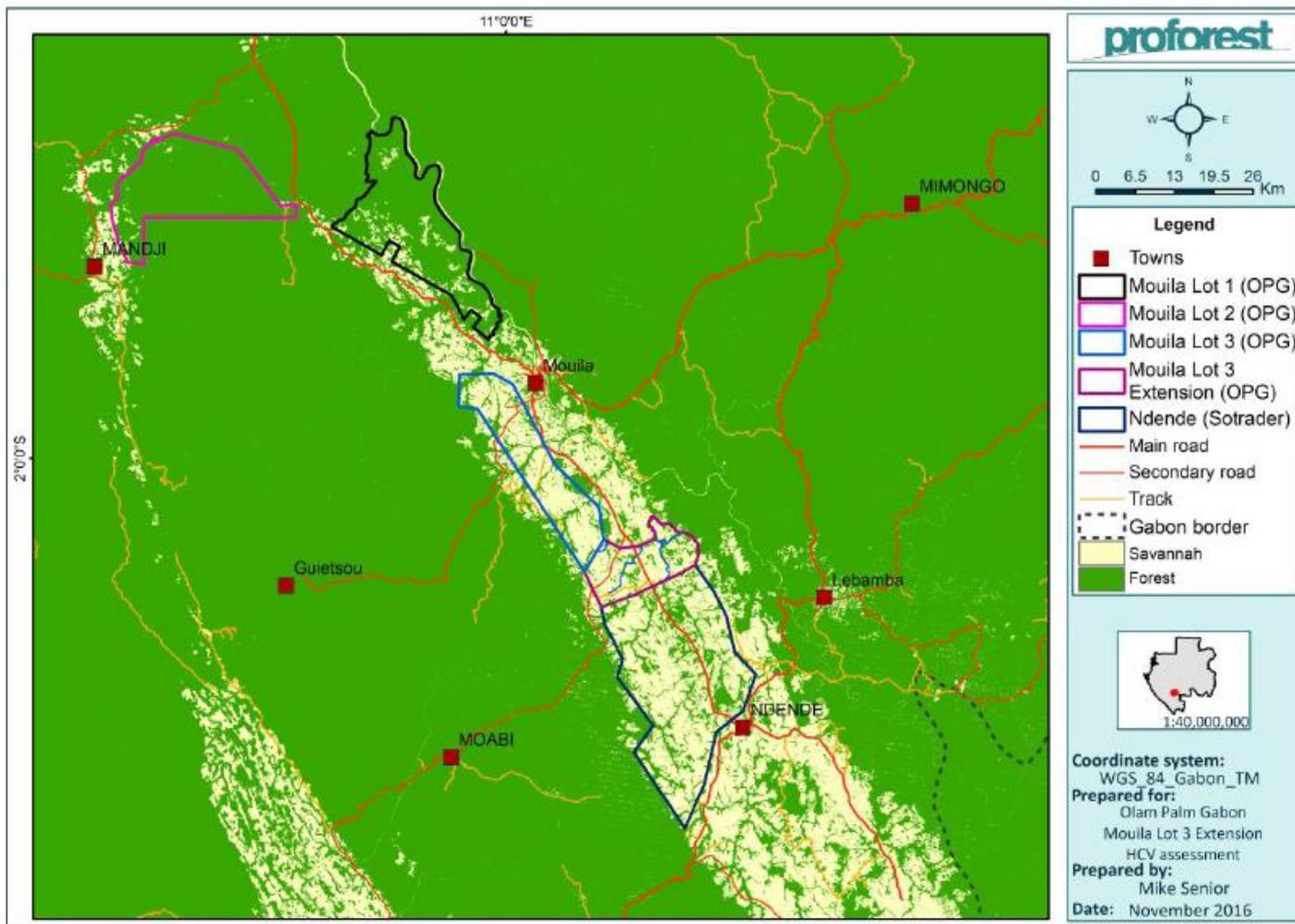


Figure 1: Location and vegetation map showing OPG's and Sotrader's palm oil development projects in the Mouila Lot 3 Extension area. (Landcover data source: Hansen, M. C. et al 2013. Data available on-line from: <http://earthenginepartners.appspot.com/science-2013-global-forest>)

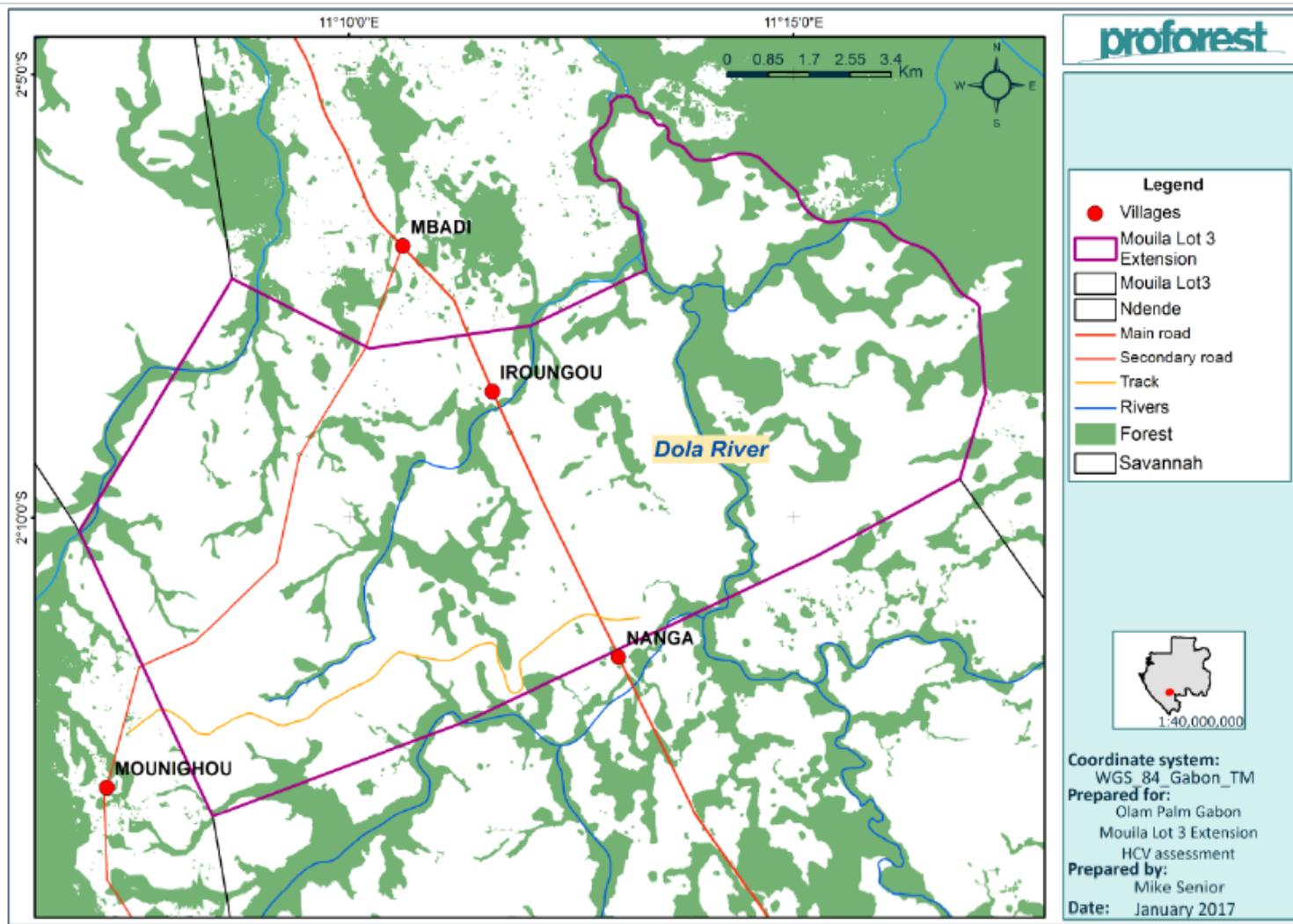


Figure 2: Map of the concession area with the location of the surrounding villages and infrastructure. The forest cover data was based upon ALOS/PALSAR (2009) remote sensing imagery made available by OPG / SOTRADER

2. ASSESSMENT PROCESS AND METHODS

2.1 Assessors and FPIC experts

Olam Palm Gabon engaged TEREА, a Gabonese environmental consultancy, to conduct the ESIA in Lot 3 extension. The firm has established expertise in the fields of mining, quarrying, gas and oil, fisheries, forestry, and infrastructure and worked previously on OPG’s Mouila and Ndende plantations. Terea worked with Proforest UK to validate the ESIA methodologies in order to ensure that results were suitable for ESIA and HCV assessment. The results from the ESIA were one of the primary data sources used for identifying HCVs. ESIAs are required by Gabonese regulations as well as the NPP. Participatory mapping is conducted as part of the ESIA process.

The HCV assessment was carried out by Proforest UK according to the requirements of the HCV Resource Network Assessor Licensing Scheme (ALS). The HCV Assessment for Lot 3 extension has been approved by ALS Peer Review and Quality Control and posted on the ALS website⁴. Proforest is an independent company working with natural resource management and specializing in practical approaches to sustainability. Their expertise covers all aspects of the natural resources sector, from forestry and agricultural commodities to conservation, supply chain management and responsible investment.

Table 3: Lot 3 extension HCV and ESIA assessment personnel

Name	ALS Licence	Organisation	Role	Expertise
David Hoyle david@proforest.net	ALS15008DH	Proforest	Lead Assessor	Conservation Social
Dr Mike Senior mike@proforest.net		Proforest	Assessor	Conservation GIS
Dr Sebastiaan De Smedt sebastiaan@proforest.net		Proforest	Assessor	Conservation GIS
Dr Audrey Versteegen	ALS15032AV	Proforest	Assessor (scoping only)	Conservation GIS
Dr Olivia Scholtz olivia_scholtz@hotmail.com		Consultant with Proforest	Assessor	Conservation Mammals
Aubin Mboumba a.mboumba@terea.net		Consultant with TEREА & lead for ESIA	Assessor	Environment Social
TEREA: Environmental and Social Impact Assessment				
Aubin Mboumba; Gustave Nguema	TEREA	ESIA coordination		
Geophysical and hydrological studies				
Jean-Charles Montaufier	TEREA	Soil, Hydrology and hydrogeology		

⁴ <https://www.hcvnetwork.org/als/public-summaries>

Vegetation and faunal studies		
Dr. Alfred Ngomanda	Tropical Ecology Research Institute (IRET)	Fauna
Dr. Nestor Engone Obiang	IRET and National Herbarium	Botany
Blaise Mboye	IRAF at CENAREST	Fish and aquatic macro-invertebrates
Patrice Christy	Independent	Birds
Tariq Stévant	Herbier National de Belgique	Botany
Pete Lowry	Missouri Botanical Garden	
Socio-economic survey		
Guy-Roger Mbatouila Obolo	TEREA	Socio-economic study and Participatory mapping

2.2 Assessment and FPIC Method

2.2.1 Pre-Assessment

The assessment team carried out a review of relevant literature to inform this work, including:

- Existing HCV assessments and ESIA's carried out in the area: Mouila Lot 1, Lot 2 and Lot 3, as well as Ndendé;
- Landscape level information and maps detailing social and environmental context of the area, such as hydrological network, roads and human settlements;
- Remote sensing data such as vegetation and topography of the concession;
- Web-based data sources including the websites of World Wide Fund for Nature (WWF), International Union for Conservation of Nature (IUCN), Central African Regional Program for the Environment (CARPE), Greenpeace and Agence Nationale des parcs nationaux/ National Parks Authority (ANPN)

2.2.2 Field Scoping

A brief field scoping was carried out in November 2015 by a Proforest assessment team led by David Hoyle, (lead assessor of this assessment), Dr. Audrey Versteegen, and two three trainee HCV Assessors. The lead assessor from Proforest already has a detailed knowledge of the area since he was part of or led the HCV assessment teams for Mouila Lot 2 and Lot 3, as well as Ndendé.

The objectives of the scoping mission were two-fold: to familiarize Proforest with the detailed specificities of the site in order to carry-out the detailed planning for a full HCV Assessment, including developing the methodologies for the baseline studies; and to conduct a preliminary consultation to understand any of the key stakeholders' major concerns regarding the development of the site. This consultation with national stakeholders took place during the November 2015 scoping mission - when the Assessment team introduced the proposed development project to WCS, WWF and ANPN and requested for their initial inputs and concerns, as well as discussions on field surveys methodologies. A scoping report was completed and sent to Olam Palm Gabon.

In addition, some of the TEREAs survey team leaders and the Direction Générale de l'Environnement (DGE) of Gabon made a separate scoping mission to the site. Together they collected information to facilitate the development of survey methodologies and determine the required survey or sampling effort.

2.2.3 HCV assessment phase - baseline survey methodologies

Substantial data and results have been accumulated from preceding HCV assessments, notably from the adjacent OPG Mouila Lot 3 and Sotrader's Ndendé concessions. Mouila Lot 3 Extension is positioned in between these two concessions, and as such its biodiversity and geophysical conditions are very similar.

In most cases it was possible to extrapolate results from the northern and southern concessions across the Mouila Lot 3 Extension concession. Additional data collection was done to address the gaps from the data collection in Ndendé or Mouila Lot 3 as identified during the scoping study. Table 4 summarizes the details of the studies previously executed in these adjacent zones (Ndendé and Mouila 3 columns); it also shows in the last column (M3 extension in blue) the additional data that was collected within the framework of this HCV assessment.

All the studies were led by experts in their respective fields. Detailed methodology for soil survey, botanical inventory in forested area and savannah, mammal survey, avifauna biodiversity, aquatic biodiversity, hydrology and water quality survey are described in the public summary report of HCV published on the HCV RN website.

The methodologies for all the studies were reviewed and approved by the Proforest HCV team prior to the execution of the field work to make sure all the required data was collected, as highlighted during the pre-assessment phase.

Table 4: Relevant existing research within the area, relevance for Mouila Lot 3 Extension and supplementary surveying/analysis conducted.

Studies		Existing data sets		Data collected under this assessment Mouila Lot 3 Extension 14,530 ha	
		Ndendé	Mouila lot 3		
		58,401 ha	23,800 ha		
Soil		Sampling completed	Sampling completed	Similar soils and geology	Additional soil texture sampling
Botanical	Forest inventory plots	41 plots (20m x 100-250m)	21 plots (20m x 250m)	Similar habitat	Additional 10 plots
	Savannah plots	190 plots (5mx5m) along 19 transects	100 plots (5mx5m) along 10 transects	Similar habitat	Savannah stratification and mapping
Faunal	Mammals – camera traps	48 traps (1912 days)	38 traps (1432 days)	Species expected to be similar	No additional data collected
	Mammals – recces	27 recces (37.5 km)	10 recces (38 km)	Species expected to be similar	No additional data collected
	Fish	14 stations	13 stations (765 samples)	Same basin	No additional data collected

	Macro-invertebrates	14 stations	14 stations (1103 samples)	Overlapping basin	No additional data collected
	Birds	3 days surveying	No bird data	Species expected to be similar	2 days surveying
Hydrology / water quality		Sampling completed	Sampling completed	Same basin	Additional flow sampling
Socio-economic	Socio- Economic study	11 villages	14 villages	4-5 common villages already studied	4 villages re-surveyed
	Participatory mapping	11 villages	14 villages	4-5 common villages already studied	4 villages re-mapped

2.2.4 Socio-economic study

A socio-economic study was executed for the four villages identified as potentially impacted by OPG's planned development project. Details on the population size of these settlements can be found in Table 5. A combination of group discussions at the village/quarter level and semi-structured questionnaires at the household level was used in a qualitative study of resource use.

Table 5: List of villages potentially impacted by the development of an oil palm plantation in the Mouila Lot 3 Extension proposed oil palm development and their estimated population (Source: TERE, 2016).

Canton	Regroupement/Village	Population (2016)
Dola nord	Nanga	64
	Mounighou	58
	Mbadi	36
	Iroungou	30
Total for the study area		188

2.2.5 Participatory mapping

For the villages listed in Table 2, a participatory mapping exercise of community territories, land uses and activities was carried out, with the objective to identify and map sites and resources of cultural significance to the local population or of value for subsistence and economic needs.

Following meeting with the local authorities, mapping was conducted in focal groups from each village. Discussions with each village aimed to generate general descriptions, and pre-identify potential overlaps and conflicts between community land-use and the development project. This was followed by

discussions with the group using a flipchart to identify and locate important sites as sacred sites, areas where NTFPs are collected, plantations, camps, hunting areas, uses along water courses and old villages.

Based on this preliminary phase, a campaign of GPS mapping was organized, during which the social mapping team and representatives of the local communities walked along paths and through customary use areas with community members to log the sites indicated on the sketch maps.

The final stage of the process included the validation of resulting digital maps by the local communities before being shown to a wider group of villages and local authorities. The detailed maps for HCV 5 & 6 can be found in section 3.

2.3 Assessment dates

Table 6: The timeline for the Mouila Lot 3 Extension HCV assessment

Activities		2015		2016											
		N	D	J	F	M	A	M	J	J	A	S	O	N	
Pre-assessment	Information exchange	■													
	Field scoping														
	Preparation and planning, methods...			■	■	■									
Assessment (field studies, consultations, HCV identification, sharing of results)	Participatory mapping and socioeconomic survey							■	■	■					
	Biological field data collection – full assessment							■	■	■					
	Validation of the participatory maps							■	■	■					
	Public consultation in Mouila												■	■	
Preliminary conclusions, concerns, and recommendations	Expert workshop												■	■	
	NGO and expert stakeholder consultations												■	■	
Reporting & Peer review	Peer review												■	■	■
	HCV reporting & submission												■	■	■

3. SUMMARY OF FINDINGS

3.1 SEIA

3.1.1 Positive and Negative Environmental, Socio Economic Impacts

The permit granted to the company Olam Palm Gabon is a vast plain with savanna, intersected by shallow valleys within which develop a forest corridor forest gallery. In the concession, savannas occupy about 78% of the total area compared with 22% for gallery forests.

This area is crossed by some rivers of which the main one is the Dola River. Several dolines in the bottom clogged with clay deposits have favored the installation of permanent lake within this concession.

The fauna that inhabits this area is very low in specific richness and abundance; however presence of some protected species is noted in the study.

There are four (4) villages and / or regrouping of villages distributed in the department of Dola:

- Iroungou;
- Mbadi ;
- Mounighou ;
- Nanga.

Activities conducted by the communities including subsistence farming, fishing, hunting, and gathering forest produce.

The project is planned in several phases:

- Land preparation;
- Establishment of temporary and permanent infrastructure of the project (roads, bridges, warehouses, offices, etc.);
- Planting (planting and plantation maintenance);
- Harvesting and processing of crops, etc.

Positive impacts of this project are:

- Job creation (840 direct jobs during operating phase);
- Support village community projects in the fields including subsistence farming, fish farming, livestock breeding etc.;
- Reduced hunting pressure (employ traditional hunters and provide alternative to bushmeat);
- Improving health provision in impacted villages: Given that the supply of medicines is a major problem in the riparian villages at the project site, the establishment of a health care and medical monitoring structure in some villages would be essential and beneficial to all local communities in the project area;
- Public lighting in the villages and possibly support for electrification (responsibility of the state) based on FPIC consultation;
- Support construction of social structures within the framework of a social contract and FPIC consultation;
- Taxes paid to the Gabonese State;
- Significant carbon sequestration (positive overall impact) due to development in savannah (low in biomass) to plantations;

- Improve soil fertility (prevent annual savanna fires, enrichment of soils in organic matter);
- Revitalization of surrounding villages;
- Avoid rural exodus.

Negative impacts of this project are:

During field preparation:

- Potential impact on air quality (dust and greenhouse gases);
- Potential impact on soil stability (erosion and destabilization);
- Potential impact on water turbidity and aquatic environments;
- Impact on soils and water in the event of leakage of hydrocarbons from machineries;
- Impact on the landscape;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and local residents at the project site;
- Impact on waste generation and management;
- Potential impact on local communities (planting in village crop areas, sacred sites, etc.).

During the construction of infrastructure (roads, bridges, bases, offices, etc.):

- Potential impact on air quality (dust and greenhouse gas (GHG));
- Potential impact on soil stability (erosion and destabilization);
- Potential impact on water turbidity and aquatic environments;
- Impact on soils and water in the event of leakage of hydrocarbons from construction equipment;
- Impact on the landscape;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and local residents at the project site;
- Impact on waste generation and management;
- Potential impact on local communities (destruction of village crop areas, sacred sites, etc.).

During the maintenance of the plantation and the harvest:

- Potential impact on air quality (aerosols and greenhouse gases (GHGs));
- Impact on soils when using crop protection products;
- Impact on water due to pesticides and fertilizers;
- Impact on the landscape;
- Production of domestic and industrial waste;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and residents on the plantation.

3.1.2 Issues Raised by Stakeholders and Assessors

The assessment team carried out two sets of consultations with important stakeholders at the national level at key milestones along the assessment process:

November 2015 National consultations: This was an introductory session to inform the stakeholders of the project, as well as of the HCV and ESIA processes that were planned. Stakeholders were asked to raise any initial concerns regarding the project, site location, planned assessment process and agree studies / methodologies. At this stage, there were no major concerns raised with the process or methodologies. Consultations were conducted with WWF, WCS, and ANPN by the Lead Assessor.

February 2016 National level consultations: During the main consultation process for the SOTRADER Ndené concession consultations by Proforest, the HCV Assessment team also took the opportunity to further discuss the Mouila 3 extension proposal. Main concern raised were continuing loss of Savannah habitat for conservation; fragmentation of the Ngounie savannah finger, and connectivity between the forest blocks on either side; need for thorough FPIC process, especially as some communities will be completely surrounded by oil palm concessions. Consultations were conducted with WWF, WCS, The Nature Conservancy (TNC) and ANPN.

September 2016 National Consultations: The second consultation session involved presentations¹⁸ of the HCV preliminary findings and recommendations, including maps, to national stakeholders. Stakeholders were given the opportunity to comment on the assessment and give their inputs. Consultations were conducted with WWF, WCS, The Nature Conservancy (TNC) and ANPN.

October 2016 Local Consultations: The Assessment team also conducted public consultations at the site level in October 2016. Both the HCV and the ESIA main findings were presented across a series of meetings in each village impacted identified during the participatory mapping, and in Mouila town in the presence of the Administration and representatives of the local communities. The consultation conducted with four villages for the duration of two days.

Table 7: Summary of concerns

Organisation	Main concerns raised by stakeholders	Inclusion in final assessment
WWF, TNC	The continuing loss of savannah habitat for conversion to palm oil in Ngounié;	Large blocks of savannah representing approx. 50% of savannahs in concession are secured in HCV management areas
ANPN, WWF, TNC	Fragmentation of the Ngounié savannah finger, and connectivity between the forest blocks on either side;	HCVs were orientated to ensure corridors in both an east-west direction, and north-south savannah direction, and condition to develop a landscape wide Ngounié Savannah Conservation Plan
WCS, WWF	Need for thorough FPIC process, especially as some communities will be completely surrounded by oil palm concessions;	Engagement, participatory mapping, and consultations with the four villages concerned have been conducted, with negotiations of the final HCV 5 areas having been completed
Mounighou village (36 participants)	Ensure that protected areas will be set-aside	HCV 5 and 6 areas have been identified and validated by the community. The final community management areas are still to be agreed through an ongoing FPIC

		process.
Nanga village (31 participants)	Need to consult on the community areas in the two concessions, Mouila Lot 3 and Ndende	The final community HCV 5 and 6 areas have now been agreed and validated by the community
Mbadi village (29 participants)	Need to protect the aquatic systems (lakes and rivers) that they use, and that they are not affected by the plantation. They do not want to have their land uses affected by the plantation	Appropriate buffer zones around the rivers, lakes and dolines have been specified in the relevant HCVs. The community zone was identified during mapping. The community have validated the final HCV 5 and 6 areas that overlap with the concession, areas they wish to retain, and areas they are willing to cede to Olam.
Irungou village (17 participants)	Concerned the aquatic ecosystems are not negatively affected by the plantation. Want to be able to continue their hunting activities	Appropriate buffer zones around the rivers, lakes and dolines have been specified in the relevant HCVs. The community zone was identified during mapping The community have validated the final HCV 5 and 6 areas that overlap with the concession, areas they wish to retain, and areas they are willing to cede to Olam.

3.1.3 List of Legal Documents, Regulatory Permits and Property Deeds

- A long-term (49 year, renewable to 99 year) agriculture lease (Bail Emphyteotique signed between the Director General of Olam Gabon, the President of Republic of Gabon and Minister of Town Planning and Housing (*Ministre de l'Urbanisme et du Logement*), dated 27th September 2016.
- Certificate of Conformity for Environmental and Social Assessment and Management Plan dated 8 March 2017.

3.2 HCV Assessment

The proposed area is rated as tier 1 based on information received from OPG and knowledge of the HCV experts. The project must include a scoping study prior to the full HCV assessment, and the conclusions of the assessment need to be peer reviewed by an HCVRN approved peer reviewers.

The peer reviewed public summary report is published on the HCV RN website.

Assessment findings / HCV identification

The Table 8 summarizes the HCVs in the Mouila Lot 3 Extension concession that were identified in this assessment.

Table 8: Summary of the HCVs identified in the Mouila Lot 3 Extension concession

HCV	Definition	Assessment identification		
		Present	Potential	Absent
1	Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels	Present	Potential	Absent
2	Intact forest landscape and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional and national levels, and landscape functions such as connectivity	Potential	Potential	Absent
3	Rare, threatened, or endangered ecosystems, habitats or refugia	Present	Potential	Absent
4	Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes	Present	Potential	Absent
5	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples...	Present	Potential	Absent
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...	Present	Potential	Absent

3.2.1 HCV 1 Species diversity

HCV 1 covers significant concentrations of biodiversity, recognized as unique or outstanding in comparison with other areas within Gabon, based on priority frameworks or field assessments and consultations. Following the HCV Resource Network’s *Common Guidance for the Identification and Interpretation of High Conservation Values*, we assess whether the savannah, forests and freshwater

ecosystems of Mouila Lot 3 Extension concession can be considered likely to support nationally significant concentrations of species, based on field surveys, literature review and expert opinion.

Interpretation in Mouila Lot 3 extension

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

Survey results

Faunal: birds

99 species were recorded from surveys in Mouila Lot 3 Extension, and 138 species in the adjacent Ndendé concession. This difference would be the result of: a) a greater survey effort in Ndendé (three compared with two surveying days), and b) more forest habitat surveyed in Ndendé and therefore forest dependant species being recorded there. None of these species are IUCN Red Listed above the vulnerable class, are endemic to Gabon or are protected species for Gabon.

In general, birds are either savannah specialists or forest specialists, with minimal habitat preference overlap. Within the savannah ecosystem, a distinction was made between **woodland savannahs** and **grassy savannahs**, in terms of the assemblage structure (diversity and abundance). The woody savannahs, patchy and generally rare in their distribution, were found to harbour a greater diversity of bird species. This corresponds with observations in the savannahs of the Batéké Plateau in south eastern Gabon by the author of the study, where the woody savannah habitat is more widespread, dense and diverse, with correspondingly high bird diversity. It is assumed that the elevated bird diversity associated with this habitat type is due to the greater micro-habitat diversity for feeding and nesting, and greater food availability. Woody savannahs are rare in Mouila Lot 3 Extension and therefore occupied only a small sampling effort. Yet 45 of the 62 savannah species recorded in Mouila Lot 3 extension (73%) have woody savannah as a habitat preference. Further to this, seven of the nine species with range distributions limited to the savannahs of southern Gabon, are found in woody savannah.

During consultations with experts, there was no consensus on whether the bird assemblages in the savannah are particularly unique in Gabon, or include rare or endemic species to warrant it being HCV 1. None of the species are IUCN red-listed. It is however a diverse bird assemblage associated with this particular habitat type, and the habitat is locally rare in its distribution and increasingly threatened. While we do not consider the bird assemblage to qualify as HCV 1, but we do recommend that the savannah habitat on which the birds depend is designated as HCV 3 (see below).

Faunal: savannah antelope

The Southern reedbuck (cobe roseaux; *Redunca arundinum*¹⁰) and Defassa's waterbuck (cobe defassa; *Kobus ellipsiprymnus ssp. defassa*¹¹) are two species of savannah antelope that have national distribution ranges confined to Gabon's southwestern savannahs, and are both fully protected under Gabonese law. Both animals rely on a mosaic of grasslands and woodland and are never far from water. Populations found in the two fingers of savannah (see Figure 2 - Nyanga to the west and Ngounié to the east) that extend northwards into Gabon from the Republic of Congo, are therefore geographically isolated in Gabon, and may also be genetically isolated populations. The Southern reedbuck populations in Gabon are completely isolated from the main distribution range for this species¹². Further to this, its theoretical distribution does not overlap with any of Gabon's National Park's. **This makes remaining populations of this species of national importance, and therefore HCV 1.**

Sightings of these species have become increasingly rare in the Ngounié savannahs where the Mouila Lot 3 extension is located. Indeed, some national experts believed that it may be locally extinct due to hunting (see HCV assessment for the Ndendé concession). This was apparently supported by the fact that neither species were detected during faunal surveys conducted in the Mouila Lot 3 and Ndendé concessions as part of the ESIA and HCV assessments that included recce-transects through the savannahs and camera traps on the forest-savannah edge.

A direct observation of the southern reedbuck was made in Mouila Lot 3 extension by P. Christy during the bird surveys in May 2016. Both a female and male were observed in the tall grassland savannahs in the south-west of the concession. During the same field mission, the carcass of a Defassa waterbuck was hung for sale at Nanga village, on the edge of the concession. It was not, however, possible to attain where this individual was hunted. Participatory mapping with this village do show that hunting is both in Mouila Lot 3 extension and the Ndendé SOTRADER concession. The socio-economic surveys report that bushmeat hunting is important revenue for these villages, which includes the southern reedbuck the Defassa waterbuck.

It is therefore clear that populations of both species are still present in the Ngounié savannahs, and that **a population of the southern reedbuck is in the Mouila Lot 3 extension**. Threats to these populations therefore include hunting and loss of habitat through savannah conversion. We recommend that the area where the southern reedbuck individuals were observed is designated as HCV 1 (Figure 14). This area is mostly savannah habitat. It contiguous with an HCV 1 block allocated in Ndendé for a plant species, and west of an HCV 3 block of savanna¹³ also in Ndendé.

This HCV area designation is considered a preliminary measure, until further data is gathered on the status of this population and therefore the most appropriate management options can be considered. It is necessary to have a better understanding on its distribution across the concession, its population size, whether it is a viable population, and if the HCV areas are sufficiently large and management interventions sufficiently robust to ensure the population remains stable and viable.

Faunal: forest mammals

Dedicated faunal surveys (camera trapping and recce-transects) conducted in the adjacent concessions did not indicate a particularly rich faunal diversity. Of 35 species considered likely to occur in the area, 25 species were recorded during these studies. While it was not possible to calculate population densities, relative abundance indices (encounter rates) were not remarkable. This included for species fully protected under national laws (Decree 0164/PR/MEF of 19 Jan 2011); the forest elephant, buffalo and water chevrotain. One forest block on the edge of the concession Mouila Lot 3 concession had evidence of chimpanzees in low densities, and was therefore designated as HCV 1.

Encounter rates tended to be higher (indicating higher densities) at the eastern and western extremities of the concessions as this is: a) further from the national highway and hunting pressure, and b) closer to the forest massifs on either side of the Ngounié savannah.

Given the proximity with hunting pressure from towns and villages and absence of large blocks of forests, there is no reason to suspect that the forest fauna in Mouila Lot 3 extension would be more rich or populace to warrant consideration of HCV 1. The suspected seasonal movement of some species (e.g. forest elephant) does, however, emphasize the potential role of the gallery forests for connectivity between the forests massifs on either side of the concession. A key criterion in this HCV assessment has been to maintain an east-west connectivity between the forest blocks. This has been achieved by orientating multiple HCV areas both in Mouila Lot 3 extension and Ndendé, to create a continuous HCV belt of savanna-forest mosaic habitat (see section 5.2.2 and Figure 15).

Faunal: aquatic biodiversity

A total of 3339 individual macro-invertebrates from 12 orders, were collected during the aquatic macroinvertebrate sampling in 30 survey stations across Mouila Lot 3 and Ndendé concessions. 996 fish from 20 families were collected during fish sampling at the same survey stations. All sites were considered to have a good diversity and assemblage structure indicative of healthy hydrological systems. Diversity and assemblage indices were calculated on results from sample stations regrouped into three groups according to a north-south gradient. The sample stations in the mid group are closest to the Mouila Lot 3 Extension. The Shannon species diversity index and equilibrium index was marginally higher for this group (although significance was not tested). These results suggest that the aquatic ecosystem is in better condition (less pollution or disturbance), probably due to distance from a major town upstream.

Two species of fish endemic to sub-basins of the Ogooué River, were recorded from single specimens in the two adjacent concessions; *Hepsetus kingsleyae* and *Brycinus bartoni* with the latter also having Endangered (EN) IUCN Red Listing status. It is not known whether populations are found in the waterways in Mouila Lot 3 extension, however using the precautionary principle one must assume that these species are present. Therefore, **we consider it necessary to designate all the rivers as additional HCV 1 areas specifically for these fish species.**

Vegetation - forests

The four forest types identified in the Ndendé and Mouila Lot 3 concessions are also represented in the Mouila Lot 3 Extension. The species composition in the forest was very typical of disturbed, regenerating or seasonally inundated forests. **National experts consulted do not consider the forest assemblages to be significant at a national level and so are not considered HCV 1.** The desk-based risk assessment conducted by Missouri Botanical Garden (MBG) did, however, identify nine potentially threatened gallery forest plant species expected to occur in the area. These results need to be followed-up with further field studies, and confirmed presence of these species might warrant assigning parts of the gallery forest as HCV1. On the other hand, due to OPG's commitment to forest conservation¹⁰ (which states "no deforestation or conversion of HCVs or HCS forest"), all gallery forests in the site will remain protected. Furthermore, this HCV assessment assigns all gallery forests as HCV4.

Vegetation - savanna

Savannahs cover the majority of the concession (approx. 78%), and are now considered a threatened habitat in the landscape due to the expanding oil palm. In the botanical risk assessment by MBG, seven species of conservation concern (IUCN Red Listed) are considered very likely to occur in savannah areas of the concession. Although more field data is needed, the loss of savannah habitat no doubt poses a threat to these savannah species. It was not possible to map with any precision where the potential HCV 1 savannah plant species are distributed within the concession. **To overcome this data-deficiency obstacle, the assessment has rather focused on a precautionary strategy of capturing some large blocks of savannah across the concession that should capture the range of savannah habitat types, including three savannah types considered a priority for conservation by MBG (woodland savannah, doline savannah, and inundated / seasonally inundated savannah).** This should increase the chance of protecting any populations of RTE savannah species. In addition, the assessment also proposes a north-south savannah corridor as a key conservation requirement in this savannah finger.

HCV corridors – This concession forms the last remaining major block of undeveloped savannah in the northern Ngounié finger. Given the current level of threat to this habitat, the assessment team strongly feels that two HCV conservation corridors need to be built into this concession area to ensure savannah connectivity both north-south along the eastern side of the finger, but also east-west across the concession to ensure connectivity between two important (likely HCV 2) forest blocks. The value and functionality of these two corridors is to ensure that there is genetic connectivity across the landscape, given the raised and rising level of threat to this landscape. Connectivity will, importantly, strengthen the resilience of the landscape to future shocks, including those from global climatic change. The corridors are designated HCV 1. **Note:** The HCV assessment for SOTRADER's Ndendé concession left a provisional band of 5km in the north of the Ndendé concession to be potentially re-designated with HCVs subject to this assessment. Therefore, this 5km band has also been (re)assessed using new data collected during the assessment of Mouila Lot 3 Extension, and new HCV areas in this 5km band have

been identified. OPG / SOTRADER will need to re-consult with the local communities and resubmit amendments of the HCV report to RSPO and the HCVRN.

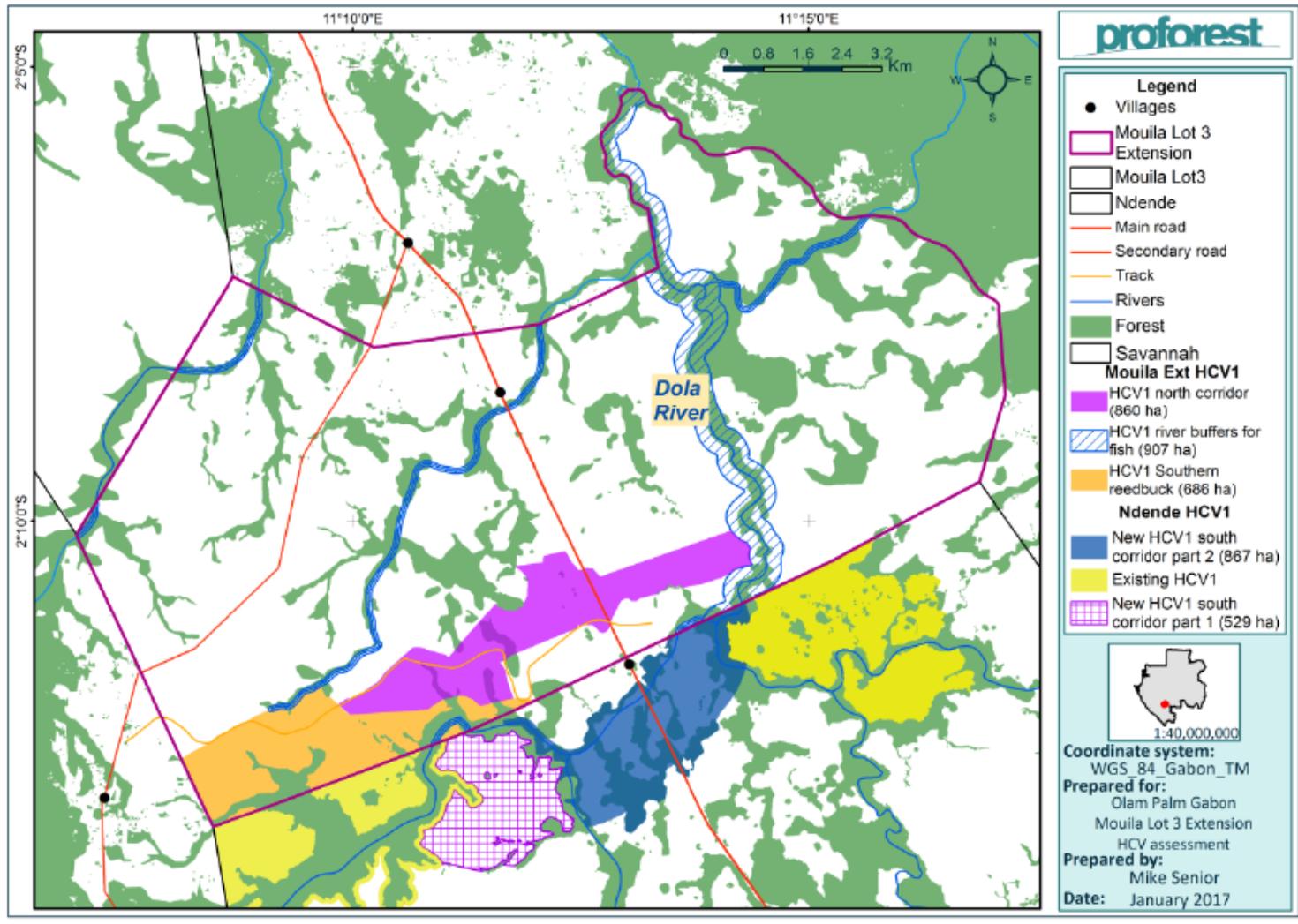


Figure 3: Proposed HCV 1. Recommended area for protection of a population of *Redunca arundinum* (Southern reedbuck); this proposed HCV 1 area is contiguous with an HCV 1 area in Ndendé. The rivers are also considered HCV1 for endemic fish species. The purple HCV 1 band is part of an HCV corridor to provide east-west connectivity. The HCV areas in the adjacent concessions are included, to provide a landscape perspective.

3.2.2 HCV 2 Landscape-level ecosystems and mosaics

The Mouila Lot 3 Extension concession is not located near an Intact Forest Landscape (IFL)⁵. The closest Central African Regional Program for the Environment (CARPE) landscape to the site is the Gamba-Mayumba-Conkouati which extends into western side of the concession. We do not consider this project to be a threat to the core habitats and species targeted by the Gamba-Mayumba-Conkouati CARPE designation. The concession itself is not considered to be HCV 2. This said, the concession area may perform an ecological corridor role between surrounding HCV 2 forest blocks , and the issue of landscape connectivity is discussed in following section.

Interpretation in Mouila Lot 3 Extension proposed concession

HCV 2	Finding
Intact Forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional and national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.	ABSENT

⁵ www.intactforests.org

⁶ The closest IFL is located over 25km from the edge of the proposed Mouila Lot 3 extension site.

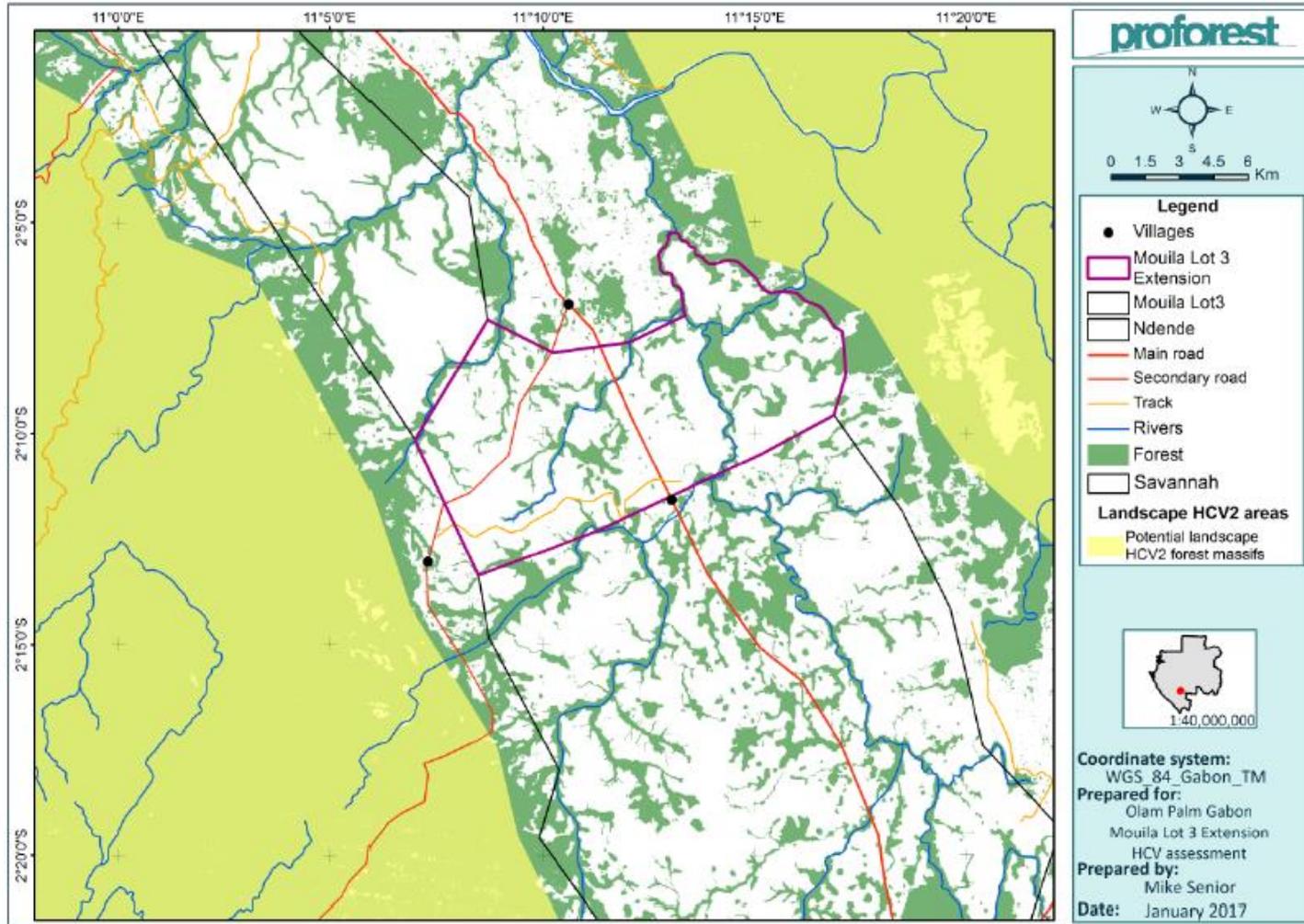


Figure 4: HCV2 forest blocks to the east and west of the Mouila Lot 3 Extension and north of Sotrader's Ndendé concession

3.2.3 HCV 3 Ecosystems and habitats

The Gabon HCV Toolkit (2008 draft) defines the following as nationally significant, rare or threatened HCV 3 ecosystems:

- *Montane forests above 700 m;*
- *Inselbergs;*
- *Begonia flora characteristics of Pleistocene refuges;*
- *Significant areas of “old growth” forest and swamp forests;*
- *Swamps forest with Gilbertiodendron dewevrei and Brachystegia sp.;*
- *Dwarf forests on ferralitics soils (e.g. Mont Belinga), and*
- *Coastal forests.*

It should be noted however that the 2008 Toolkit was developed with stakeholders from the forestry sector. Savannah ecosystems may simply not have been evaluated for their relevance to HCV 3, as it is not targeted for forestry exploitation. Expert consultation is recommended on a case by case basis to determine whether examples of such ecosystems meet the HCV threshold.

Interpretation in Mouila Lot 3 Extension proposed concession

HCV 3	Finding
Rare, threatened and endangered ecosystems, habitats or refugia.	PRESENT

The three main categories of ecosystems identified within the Mouila Lot 3 Extension site which might be considered as candidate HCV3 ecosystems including:

Savannahs

Experts have confirmed that the savannah types and species composition between the major savannah blocks in Gabon are not identical (Walters et al, 2012), and therefore there is a speculated level of uniqueness that could be considered significant if more field data was available. The drier savannahs in the western part of the concession are considered to be similar to the savannahs in the parks of Moukalaba-Doudou and in Lopé; while the wet doline savannahs in the eastern part, do not feature in any of Gabon’s protected areas, and therefore they need special attention.

Since 2012, the savannahs to the north of Ndendé have been intensively targeted for agricultural development. As a result, this ecosystem is becoming increasingly rare (see Table 6). The savannah coverage of the Ngounié finger north of Ndendé is estimated as 146,244 ha (of which approximately 50% is found inside the OPG / SOTRADER concession leases). OPG and SOTRADER will be developing 80% (60,959 ha) of the savannah areas inside their permits and setting aside 15,421 ha as HCVs / HCV management areas (including the findings of this assessment). Since savannahs outside of the permits are not protected, although not necessarily under any serious threat currently, this means that only 10% of the Ndendé – Mouila savannahs will be conserved. Further efforts by GoG will be required to ensure that in addition to this commitment by OPG a larger area of savannah is secured for conservation in the long-term.

Table 9: Savannah coverage, development and protection in the Ngounie finger.

Area	Total land area (ha.)	Area savannah (ha.)	Area Savannah converted to palm (ha.)	Area Savannah protected as HCV (ha.)
OPG Mouila Lot 1	35,354	5,782	5,365	417
OPG Mouila Lot 2	31,800	1,400	1,400	0
OPG Mouila Lot 3	23,680	17,599	16,500	1,099
OPG Mouila Lot 3 Ext*	14,530	11,441	5,075	6,366
Sotrader Ndendé	58,401	40,158	32,619	7,539
TOTALS	163,765	76,380	60,959	15,421

*subject to the approval of the maps and figures in this HCV assessment.

The combination of its potential uniqueness and increasing rarity and threat, means that the savannah habitat warrants HCV 3 status. In consultation with national and international experts, the following criteria for orientating the protection of savannah habitat as HCV3 were identified:

- large savannah blocks that have a higher probability to capture the range of savannah habitat types;
- maximise areas of wet savannah;
- maximise areas of woody savannah¹⁷, and
- ensure connectivity between savannah HCV blocks and across the Ngounie savannah ecosystem.

Gallery forests

All the major forest areas found within the Mouila Lot 3 Extension site run along watercourses in relatively narrow galleries. Their vegetation is typical of degraded forests, which is coherent with the seasonal burning of the savannahs and the constant state of recolonization of the forest edges. They are

dominated by species from the Euphorbiaceae, Caesalpiniaceae, Annonaceae, Olacaceae, Anacardiaceae, Moraceae, Flacourtiaceae, Mimosaceae, Meliaceae and Myristicaceae families, a species composition widespread in the forests of southern and coastal Gabon and the Ngounié region, and not indicative of exceptional forests in the landscape context. The gallery forests of this concession were consequently not assessed as HCV3.

Dolines

The soil and hydrological studies carried out within the scope of the ESIA for Ndendé highlighted the particularity of the site; this is the same in Mouila Lot 3 extension. Due to its location within the Ngounié syncline, it lies on two different main parent material formations. The eastern half of the concession has a varied microtopography and in particular a dense network of shallow lakes and ponds of varying sizes termed *dolines*⁷. This microtopography was highlighted by several experts as having a high potential for biodiversity, both botanical and faunal⁸: they may hold a diversity of herbaceous plants and have also have some significant importance for waterbirds, due to a higher water table within the depressions formed. **The dolines are considered by this assessment as being HCV 3**

The dolines should be considered as potentially important seasonal wetlands, and Olam should commission further detailed studied. We recommend that the Olam team delimit the dolines > 1000 m² before any land operation takes place, and set those aside as potential HCV3, with a buffer adequate to the size of the doline⁹ and corresponding with SOP for operations in these zones. These buffer zones are also considered as potential HCV3. In addition to this we recommend that the areas with the highest aggregations of dolines are placed into larger set-aside blocks to minimise risks to these wetland habitats and optimise the potential for preserving the long-term viability of the associated biodiversity. An overview of HCV3 present in the Mouila Lot 3 Extension concession is given in Figure 5.

Furthermore, there are some caves and associated lakes in the same area which are likely to have local traditional values as well as being of national cultural significance¹⁰. Very little is known about this unique ecosystem, nevertheless they should be considered HCV 3 (as well as HCV 6) and be managed by Olam with special SOP in the same way as dolines.

The **HCV 3 Savannah mosaic** selected for protection, importantly includes forest, gallery forest, different savannah types and forest/savannah edge. This large block was chosen to be in the eastern side as it is where there are higher concentrations of both wet doline savannahs (unique) and woody savannah (important for birds). It is adjacent to the forest massif to the west and is reasonably inaccessible (east

⁷ A hollow or basin in a karstic region (Oxford dictionary). In the Mouila Lot 3 Extension concession, these have been plugged by clayey material, which results in permanent or seasonal lakes/ water bodies.

⁸ Personal communications with Tariq Stévant (Missouri Botanical Garden - also quoting J.P. Vande weghe), Patrice Christy (avifauna specialist) and Marie-Claire Paiz (The Nature Conservancy).

⁹ Following the guidance of the Gabon HCV draft National Interpretation: water bodies > 2000 m² should have a buffer of 50 m; while water bodies > 1000 m² but < 2000 m² should get a buffer of 30 m; for water bodies < 1000m² a buffer zone can also be established at the request of the local communities depending on their use of the lake / lake area.

¹⁰ Richard Oslisly (pers.comm. 2016)

of the River Dola). It is important that the savannah areas immediately to the north and to the south of this HCV3 block are prioritised for conservation if this north-south savannah/ gallery forest corridor is to provide long-term north-south connectivity. These areas to the north and south of the HCV 3 block are outside of OPG and SOTRADER concessions, so SOTRADER will be required to show leadership in working with the government, local communities and stakeholders to ensure the functionality of this corridor as part of a required *Ngounié Savannah Conservation Plan*.

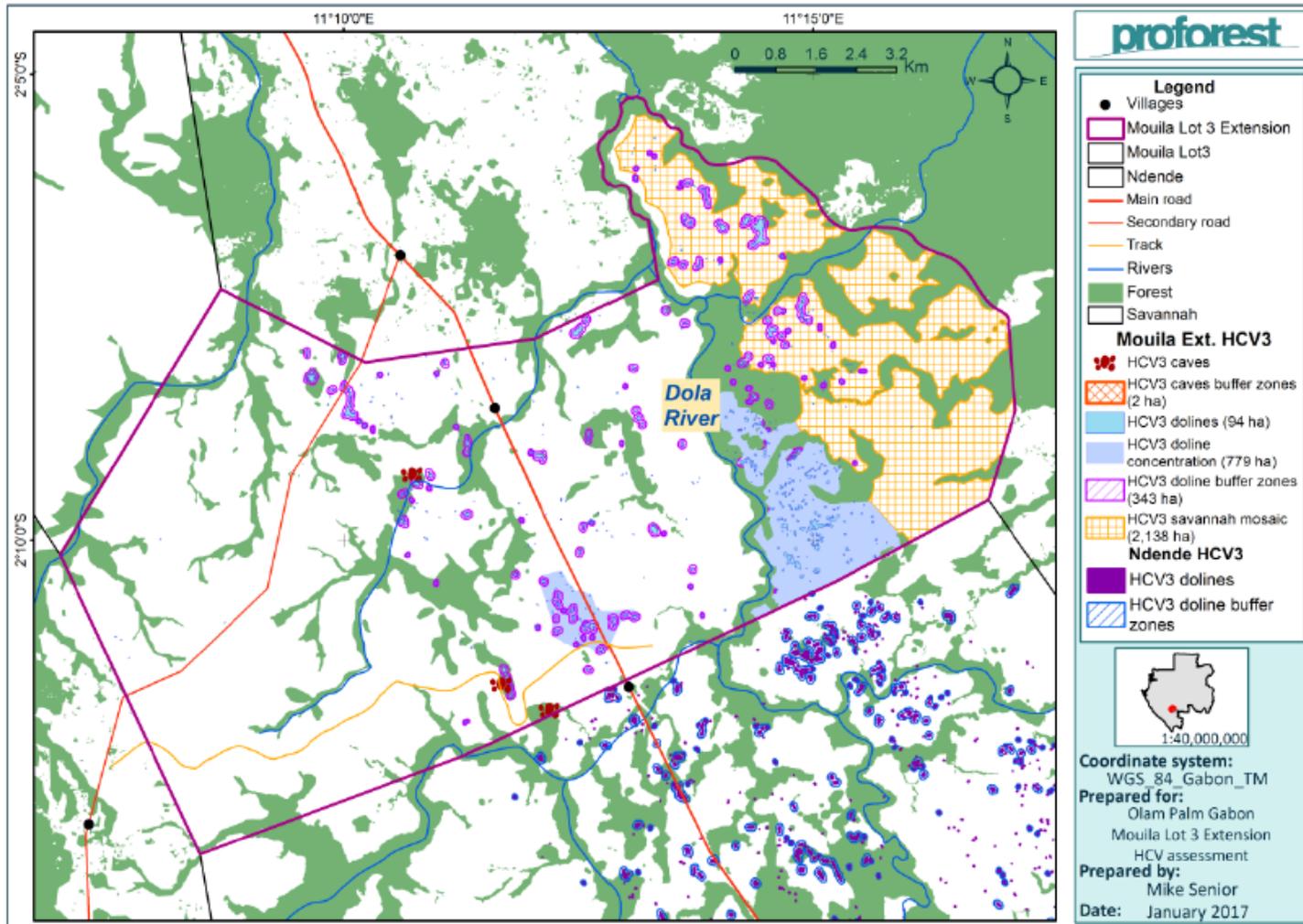


Figure 5: Proposed HCV 3. Recommended areas for protection of a representative sample of savanna habitat and savanna biodiversity (hashed orange), dolines (blue) and aggregations of dolines (light blue). The HCV areas in the adjacent concessions are included, to provide a landscape perspective. The proposed HCV areas in Mouila Lot 3 Extension, in combination with HCV areas in northern Ndendé form a continuous corridor of set-aside both in an east-west orientation between the forest massifs, and north-south orientation to maintain connectivity of the Ngounié savannah.

3.2.4 HCV 4 Ecosystem services

Water quality and quantity

The Mouila Lot 3 Extension concession area spans six sub-catchments of the Dola River, and presents a relatively dense hydrological network of both permanent and seasonal rivers and streams. Any degradation of rivers crossing the site would impact aquatic biodiversity (see Section 5.2.1), and would in turn potentially change the quality of the Ngounié waters, with potentially serious downstream consequences. This site is located upstream of several villages and the town of Mouila, where populations have confirmed during the socio-economic surveys that rivers are used for drinking water and fishing.

Ecosystem services are considered of critical importance (HCV4) when their loss would result in serious suffering for local communities, and/or there isn't an obvious or reliable alternative to the services. Given the porosity of soils and the vulnerability of the ground water aquifers, special care is required and appropriate SOPs will be prepared and implemented. This places critical importance on the role of the riparian vegetation in protecting water quality and quantity.

It should be noted that forested areas in the site are generally located along the permanent and temporal watercourses crossing the site and in seasonally flooded zones. **Consequently, at the very least all existing gallery forests within the site should be conserved as HCV4 areas.** We also recommend that OPG measure a 300m riparian buffer zone on each side of the Dola, which is a direct tributary to the Ngounié, and a minimum 50m buffer on either side of each of the main Dola tributaries (see Figure 6). Where the existing forested vegetation is not sufficient within these set buffers, OPG should put in place active management measures to permit the restoration of sufficient natural vegetation to ensure an adequate protection of the corresponding watercourses. Until the vegetation is restored, appropriate management measures should be in place to prevent erosion; the buffer zones should be clearly delimited and machinery forbidden to operate in those areas. Vegetation cleared within the plantation could be used to stabilise non-buffered areas until re-establishment of vegetation.

Soil erosion control

Apart from river banks, the general topography of the site is flat or undulating. Soil erosion control is not considered a significant or critical function of the vegetation cover outside of the existing gallery forests, which will be conserved as HCV4 management areas (see Figure 11).

Interpretation in Mouila Lot 3 Extension proposed concession

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

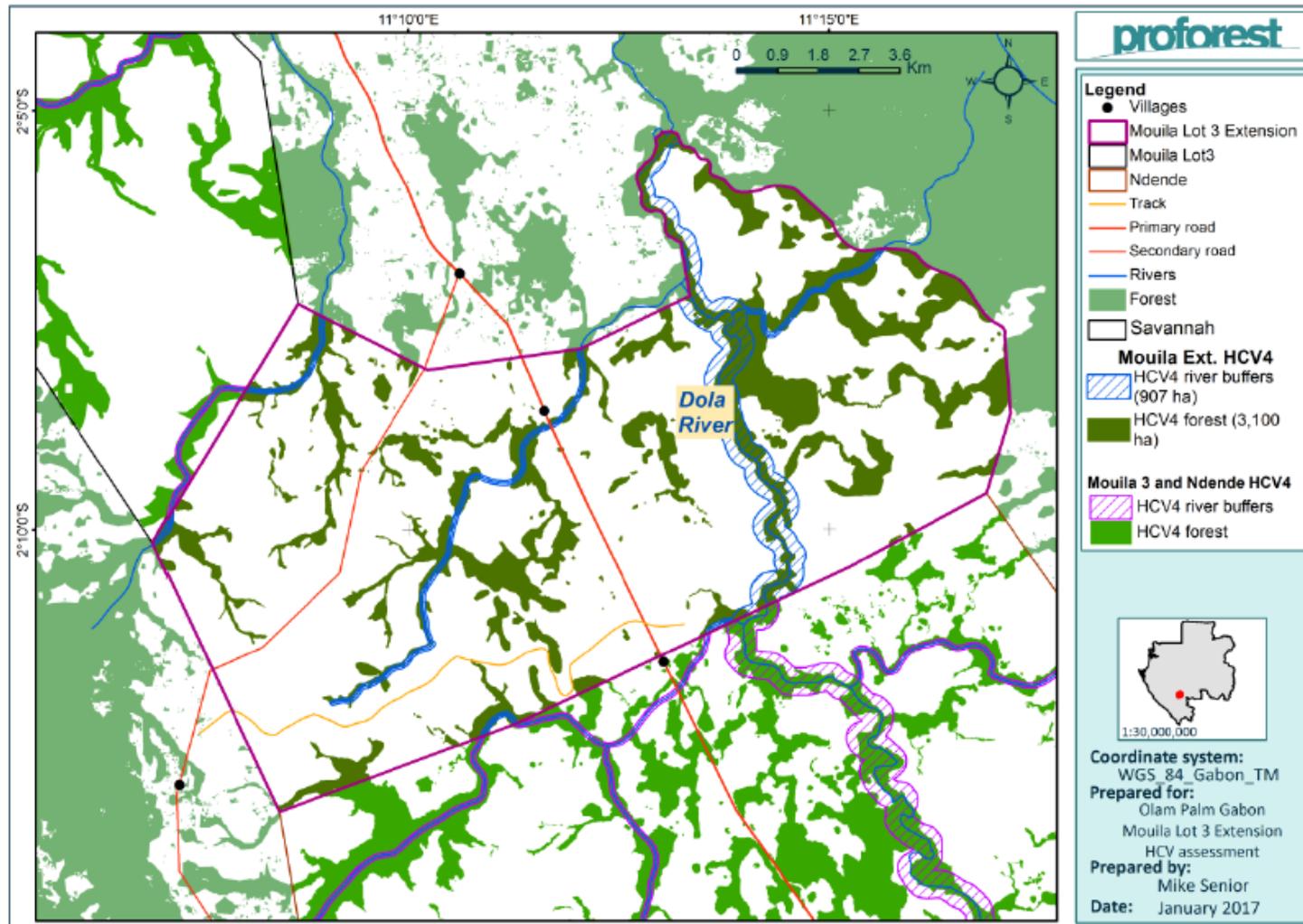


Figure 6: Proposed HCV 4. Recommended areas for protection hydrological services and water quality of the Dola river and its tributaries. The HCV areas in the adjacent concessions are included, to provide a landscape perspective.

3.2.5 HCV 5 Community needs

Local communities located in and around the proposed Mouila Lot 3 Extension concession rely on small-scale subsistence farming, fishing, hunting and the collection of local non-timber forest products (NTFPs) for their livelihood.

Water resources

The water needs (including for drinking, cooking and washing) of local communities are generally met using the hydrological network in the area, despite the presence of water pumps in all the villages. As a consequence, all the watercourses within the concession are considered HCV5 for all the communities directly impacted by the planned operations and those located downstream from the site.

We consider water needs to be covered with HCV4 (protection of water quality). It is understood that water is a basic need and any HCV4 area for water quality control should also be considered an HCV5 management area for water (see Figure 6).

Farming

With a cash economy limited by poor access to markets, most households either produce or collect from surrounding areas most of their basic food items. Farming, for instance, includes growing cassava, yams, and bananas as staple foods to be consumed in the village. Some agricultural products (e.g. aubergines, avocados) are less important for local consumption and are preferentially sold. Agriculture is generally practiced in plots within close proximity to the village and access roads. The scale of subsistence agriculture is further kept low by the relatively high average age of the population. While subsistence agriculture is not normally considered an HCV5, we think that considering the vulnerability of local populations, in this context food crops should be considered a critical basic need of local communities.

Hunting, Fishing and Gathering

Fishing, hunting and gathering of NTFPs are all considered critical to local communities' livelihoods due to the importance of these activities to fulfil food requirements. The level of poverty in these villages being notable compared to villages on the main Mouila-Fougamou axis, a reduction in the food supply could create significant hardship especially for the elderly or infirm residents.

The participatory mapping exercise conducted in the villages in and around the proposed site produced community resource maps showing complete zones used by local communities all around their villages (360° surveys). The land occupied and used by two villages fall entirely within an oil palm concession; Irungou in Mouila Lot 3 extension, while Nanga is positioned between the Mouila Lot 3 extension and Ndendé SOTRADER concession (see Figure 7). The remaining two villages conduct a relatively small proportion of their activities in the concession, and therefore perhaps not all the community-use zones overlapping with the concession are *fundamental* in satisfying basic necessities, and should be assessed as HCV 5.

However, HCV 5 areas should be “identified through engagement with communities or indigenous people”, consequently **following a precautionary approach, all activities described above as basic needs which overlap with the Mouila Lot 3 Extension site are assessed as HCV 5** pending further community consultation and negotiation through a thorough Free, Prior and Informed Consent (FPIC) process. The HCV 5 zones are based upon the activities of the local communities in the area as indicated in the participatory maps drawn with the villages. Figure 7 below shows the areas surrounding the villages used by communities for the key activities that support the communities’ basic needs – i.e. the HCV 5 management areas.

OPG has made considerable progress discussing with the communities of Iroungou, Mbadi Nanga and Mounigou for access and use of some of their land including HCV 5 areas for the plantation development. Figure 14 shows the areas that the communities have expressed that they wish to retain as their HCV 5 areas. Although OPG have made these provisional agreements with the communities the final HCV maps will need to be definitively agreed in writing with these communities.

Interpretation in Mouila Lot 3 Extension proposed concession

HCV 5	Finding
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.	PRESENT

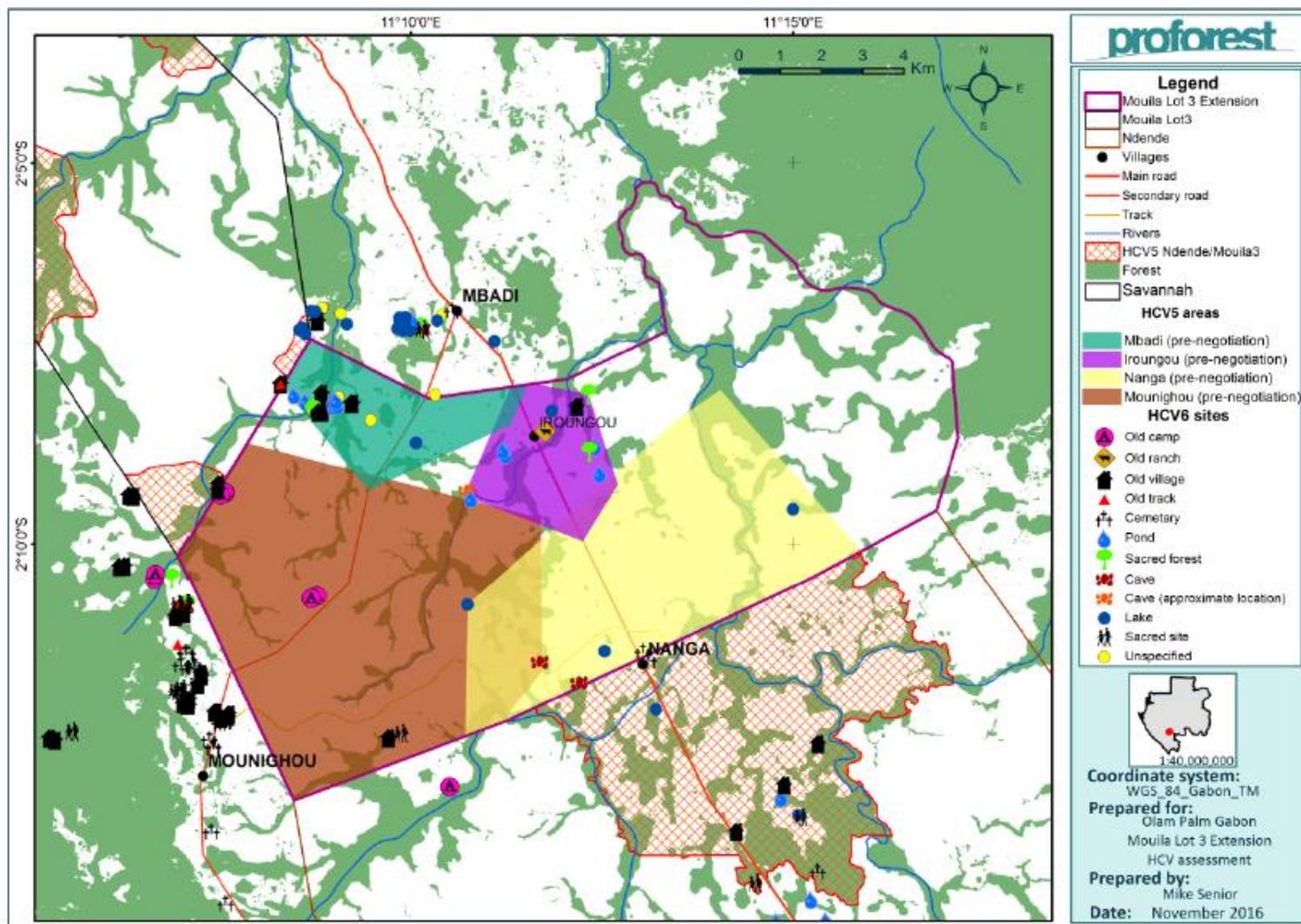


Figure 7: HCV 5 and 6 findings. Dots represent individual activities identified by the four villages during participatory mapping. The coloured polygons surrounding all land-uses pertaining to each village that fall within the concession, i.e. minimum current rural-community land use that overlaps with the concession prior to negotiations. The red hashed areas in Mouila 3 and Ndende are the final agreed community zone that has been negotiated between villages and SOTRADER/OPG.

3.2.6 HCV 6 Cultural Values

There are several sites of local significance within the site, including several cemeteries, caves, sacred ponds, sacred groves, and old villages. Some of the caves also hold a cultural value and have been noted by local communities during the participatory mapping exercise. These were presented and validated on the community maps by TERE. These sites consist of i) **old abandoned villages and cemeteries**, and ii) **sacred sites** including forests, lakes and caves - all these sites are used for various traditions and rites, including initiations. In consultation with Richard Oslisly, a regional expert on geology and archaeology, the geological forms of the caves and associated lakes mean they could also be considered of national cultural significance.

The preliminary HCV 6 areas are shown in Figure 7. This map should be considered indicative; it is recommended that OPG verify and validate a final set of HCV6 sites prior to any clearance. Thereafter, the management and access of all the sacred sites within the concession boundary must be negotiated and agreed with members of the local communities.

OPG has made considerable progress discussing with the communities of Iroungou, Mbadi, Nanga and Mounigou for access and use of some of their land including HCV 5 areas for the plantation development. Figure 8 shows the areas that the communities have expressed that they wish to retain as their HCV 5 areas. Although Olam have made these provisional agreements with the communities the final HCV maps will need to be definitively agreed in writing with these communities.

Interpretation in Mouila Lot 3 Extension proposed concession

HCV 6	Finding
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

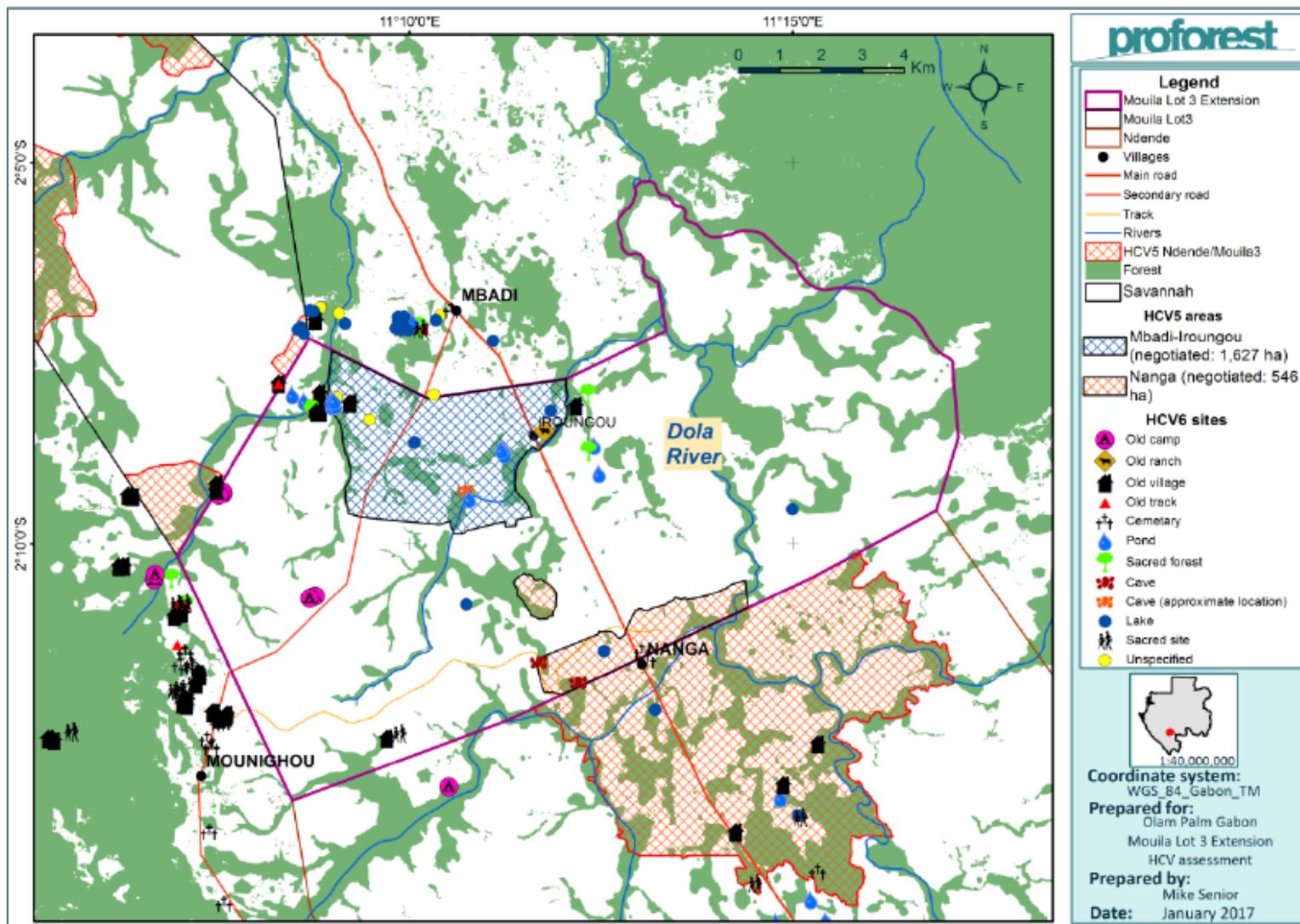


Figure 8: HCV 5 and 6 map. Olam has already carried out land consultations with the local communities. This map represents the agreed residual HCV 5 boundaries that overlap with the extension agreed with Mbadi, Irongou, Nanga and Mounighou.

3.2.7 Summary

These savannahs have been targeted for industrial-scale agriculture as the area provides the suitable agronomic conditions, and because Olam (the principle oil palm company in Gabon) has committed to forest conservation in general and zero-deforestation in this site. The Mouila 3 Extension is located in the same wider landscape as Olam's Mouila Lots 1-3 and SOTRADER's Ndendé concession (Figure 2). As a result, the Ngounié savannahs are experiencing a cumulative landscape fragmentation effect and are being lost at a rapid rate (est. 61,000 ha or 42% of the Ngounié savannahs north of Ndendé town to be converted to oil palm) and the long-term viability of this ecosystem and its associated fauna may be compromised. It is imperative that a conservation plan is developed for these savannahs by the Government under the leadership of Olam (see below).

Ecological corridors had not been considered necessary in the previous HCV assessments for SOTRADER's Ndendé and OPG's Mouila Lots 1-3, but given the relative importance and potential uniqueness of this habitat type, and coupled with the level of threat, corridors need to be established as part of this HCV assessment. Mouila Lot 3 Extension occupies the remaining space between two large industrial oil palm concessions, and therefore provides the last opportunity to maintain ecological connectivity functions. There have therefore been two important additional HCV objectives in this assessment to those in preceding HCV assessments:

1. Ensure a representative sample of the Ngounié savannah habitat types are included in HCV management areas, in blocks sufficiently large and connected to ensure their viability; these blocks should focus on doline and woody savannahs (Figure 14), and
2. Create ecological corridors to maintain ecological connectivity of the savannah and forest habitats (see Figure 14); to prevent a fragmentation of this savannah finger in a north-south direction, and to enable genetic migration between the different habitats and between the forest massifs in an east-west direction. Effectively this builds the resilience of this landscape.

Ngounié Savannah Conservation Plan: This assessment additionally makes the following key recommendation:

Prior to any land development in this concession, Olam should take the lead to conduct a more detailed and inclusive landscape level conservation planning process for the Ngounié savannahs with the Government and key stakeholders, including major environmental and social NGOs (e.g. MBG, WWF, WCS, TNC, Panthera, Brainforest). The output should be a Ngounié Savannah Conservation Plan which assesses the conservation needs, priorities and targets of this savannah landscape, as well as laying out the agreed strategies by Government and the private sector to ensure the long-term protection of critical parts of this ecosystem, including, but not limited to:

- Protection of priority savannah types by the State in existing and new protected areas (such as Moukalaba-Doudou, and Reserve de Faune Mont Fouari);
- Savannah protection by the OPG, SOTRADER and other members of the private sector in:
 - Maintaining HCV management areas inside existing concessions;

- Securing, as a minimum, the two east-west corridors across the middle of the savannah finger (as per this assessment).
- Extending their respective Mouila lot 3 concession and Ndendé concession eastwards towards the edge of the forest massif to secure the wetter doline savannahs in order to secure a north-south corridor along the eastern side of the savannah between Ndendé and Mouila.

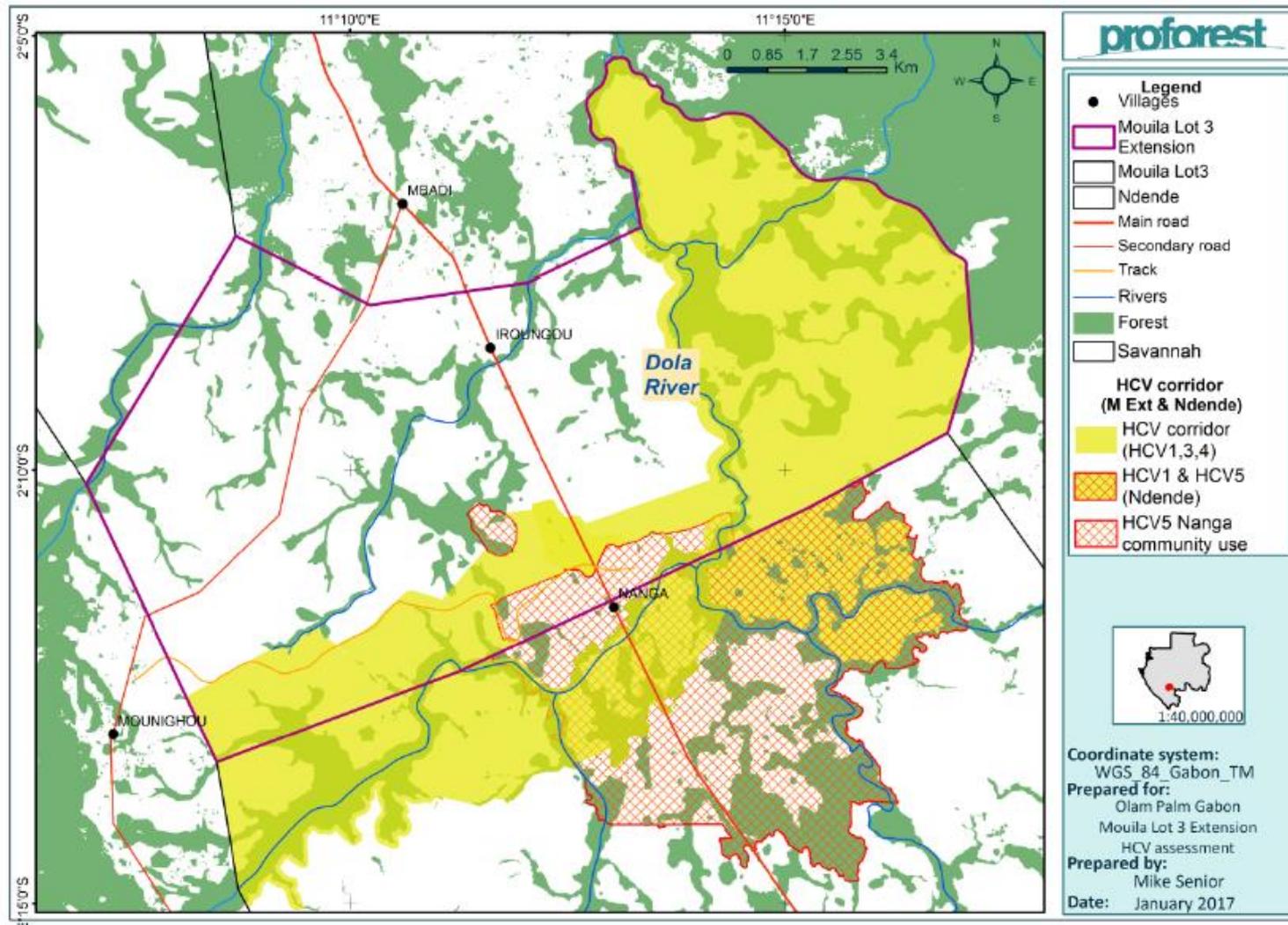


Figure 9: HCV 1-4 Map of Mouila 3 Extension and Ndendé concessions showing how the HCV 1-4 areas form an important East-West ecological corridor ensuring genetic connectivity across the Savannah/forest mosaic between the two forest massifs. Note: red-hashed area is HCV 5. The orange red-hashed area (HCV 5 & 1) will require a special management regime to ensure biodiversity objectives are met in this HCV 5 area. The large HCV 3 block to the east enables the functionality of a north-south corridor along the eastern edge of the savannah finger.

3.3 Soil and Topography

The soils had been extensively surveyed and characterised in Ndendé and Mouila Lot 3 as part of the ESIA following a two-pronged approach:

1. Desk based study of existing information on the soils of Gabon and in particular the Mouila Lot 3 extension area; and
2. Soil sampling and analysis of the six main soil types found within the concession area.

The preliminary desk based study was conducted in July 2016 by Param Agricultural Soil Survey (M) Sdn. Bhd to study soil and land suitability of the area (14,530ha). The site is classified as level to rolling terrain (0-12°). Soil suitability map is presented in map and table below.

Additional soil sampling was conducted as part of the ESIA baseline study. **No peat** soil has been identified in the proposed area. Riparian buffers have been identified as HCV 4 and will be managed for soil and water conservation.

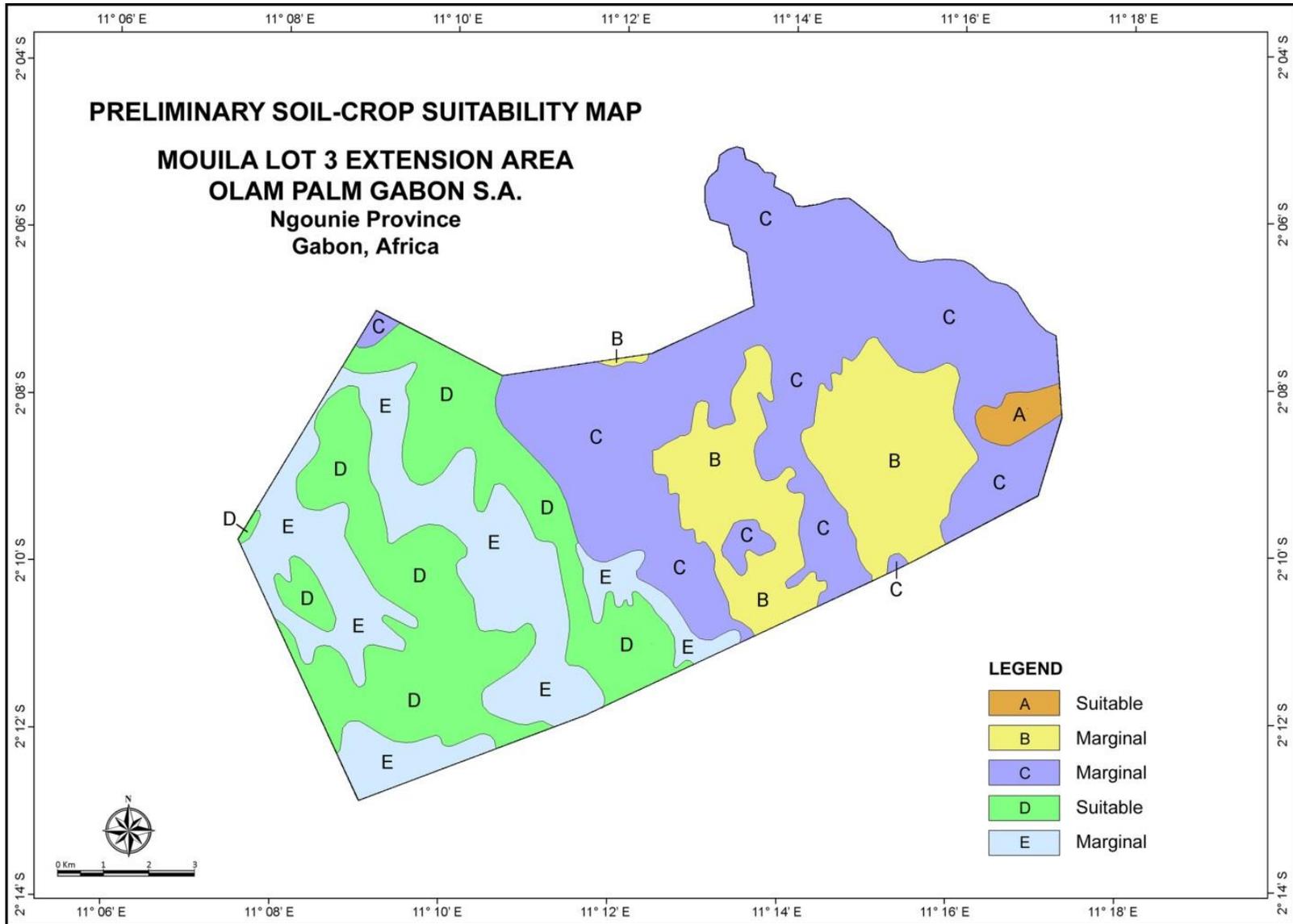


Figure 10a: Preliminary Soil-Crop Suitability Map of the Mouila Lot 3 Extension Area, Ngounie Province, Gabon, Africa

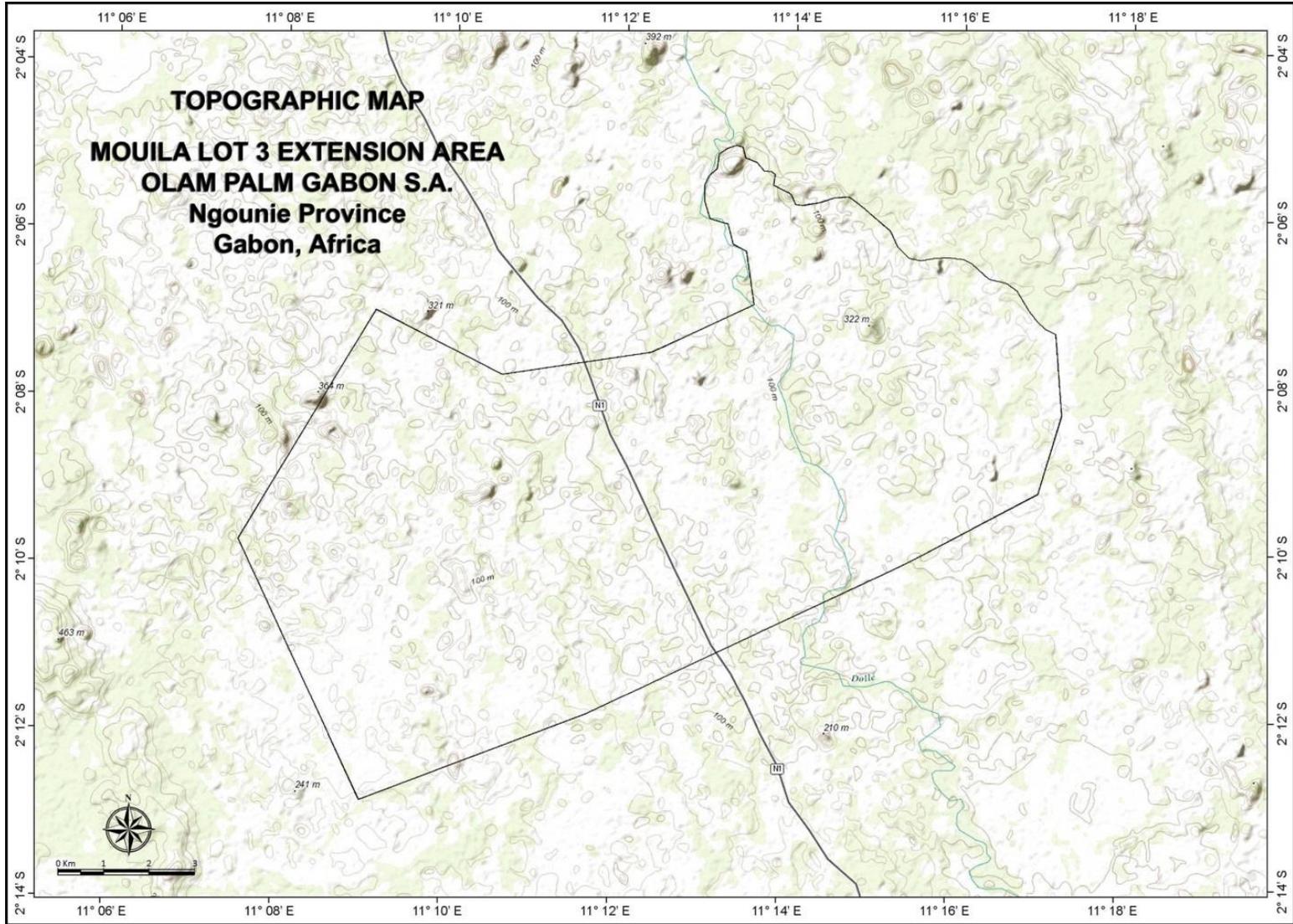


Figure 10b: Topographic Map of the Mouila Lot 3 Extension Area, Ngounie Province, Gabon, Africa

Table 10: Preliminary Soil Crop Suitability Map Legend for Mouila Lot 3 Extension Area.

Parent Material	Map Symbol	Slope Class (%)	Soil Description	Suitability for Oil Palm (Limitations)	Management Practices Needed	Extent	
						Ha	%
Sedimentary Rocks	A	Rolling (12-24)	Deep (>100 cm) fine sandy clay; Moderate base saturation; Moderate to low fertility soils over calcareous sedimentary rocks.	SUITABLE (Fertilization)	Correct fertilizer applications using soil/leaf analyses data.	174.1	1.2
Pediments	B	Undulating (4-12)	Moderately deep (50-100 cm) sandy soils with lateritic gravels in the 50-100 cm depth overlying limestone rock. Moderate base saturation.	MARGINAL (Moderate depth, Possible Ca/Mg:K imbalance)	Monitor the appearance if any of Ca/Mg/K imbalance symptoms.	2,448.4	16.9
	C	Undulating to Rolling (4-24)	Shallow (<50 cm) to moderately deep (50-100 cm) soils with lateritic layer within shallow (50 cm) or moderately deep (50-100 cm). Low base saturation. Pediments over sedimentary rocks.	MARGINAL (Shallow to moderate depth)	Use deep planting holes and addition phosphate fertilizers.	5,449.4	37.5
	D	Level to Undulating (0-12)	Moderately deep (50-100 cm) sandy loams overlying lateritic gravel layers at 5 60-80 cm depth. Low base saturation. Pediments.	SUITABLE (Fertilizer application)	Correct fertilizer applications using soil/leaf analysis data.	3,534.9	24.3
Alluvial Soil	E	Level to Depressional (0-4)	Deep (100+ cm) poorly drained sandy loams to sandy clay loams. Depressions, waterlogged in rainy season.	MARGINAL (Flooding, Poor drainage, Fertilizer application)	Ensure drainage and flood mitigation practices are implemented.	2,923.2	20.1
Total:						14,530.0	100.0

3.4 Summary of carbon stock assessment and GHG Emissions

The HCS assessment was based on the HCS Approach as developed by Greenpeace, TFT and GAR, and the latest version of the HCS Forest Patch Analysis Decision Tree (v2, see HSC Approach Toolkit Chapter 6) was applied.

The carbon stock map is integrated with other conservation set asides identified during HCV, ESIA and FPIC process. The forest is classified into Young Regenerating Forest (YRF), Low Density Forest (LDF), Medium Density Forest (MDF) and High Density Forest (HDF) had to be based upon the biomass layer as no field data was available for this study. Firstly, a carbon map was derived from the biomass layer by dividing the biomass by two. It was assumed that YRF was equivalent to forest of ≥ 35 tC/ha but less than 75 tC/ha, and that LDF contained ≥ 75 tC/ha.

All riparian, gallery forest and HCS identified will be conserved and only savannah (<10 tC/ha) will be planted or developed for infrastructure. Approximately 78% of the total area is identified with <10 tC/ha, while remaining 22% with >10 tC/ha (4% with 10-35tC; 5% with 35-75tC/ha; 8% with 75-150tC/ha and 4% with >150 tC/ha).

The integrated map serves as a guide to project emission from landuse change and projecting GHG emission from different development scenarios. Final GHG emission is summarized based on optimum scenario for low emission development plan. -1.11 t CO₂e/t CPO is estimated as the potential emission (sequestration) from the proposed development.

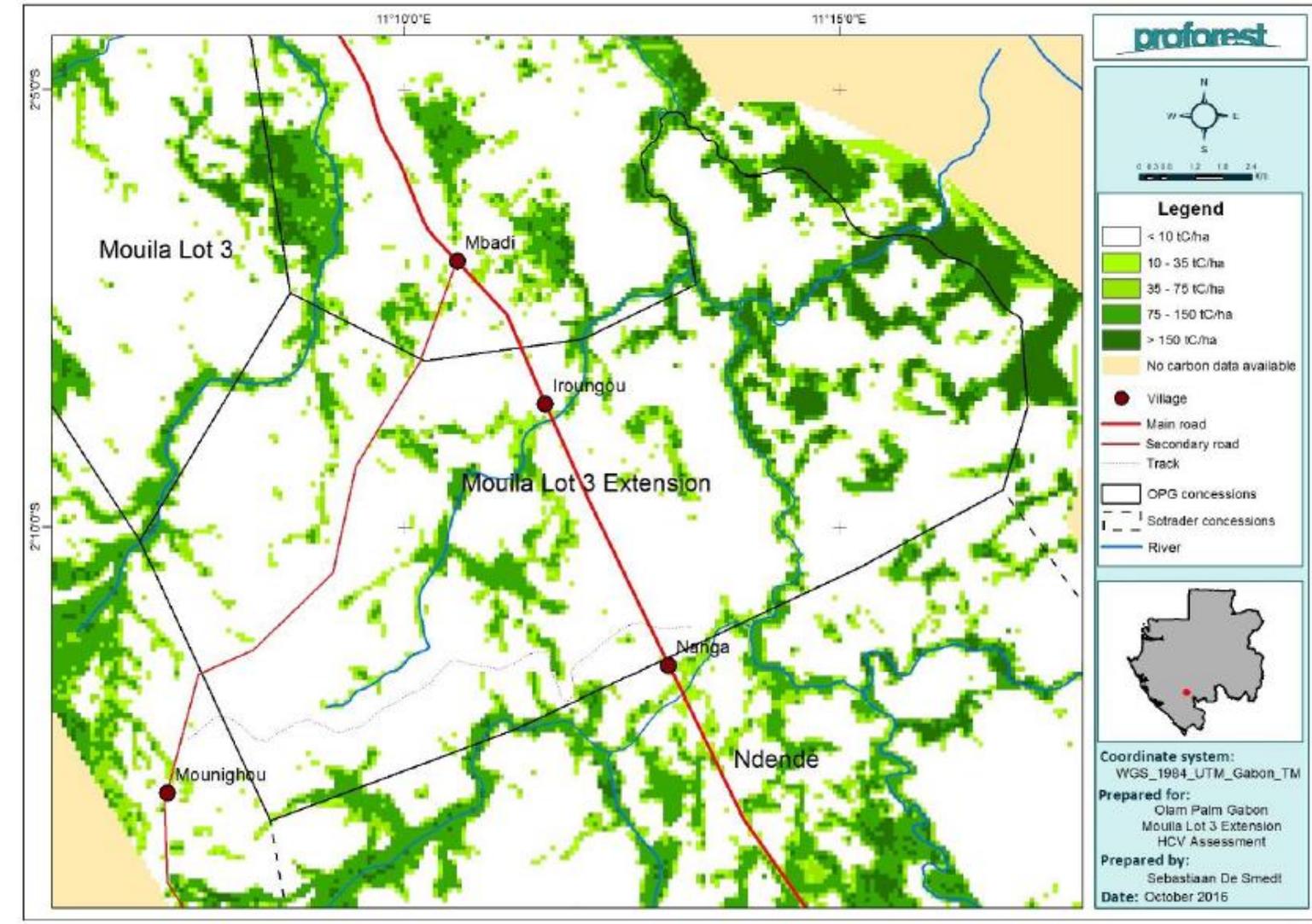
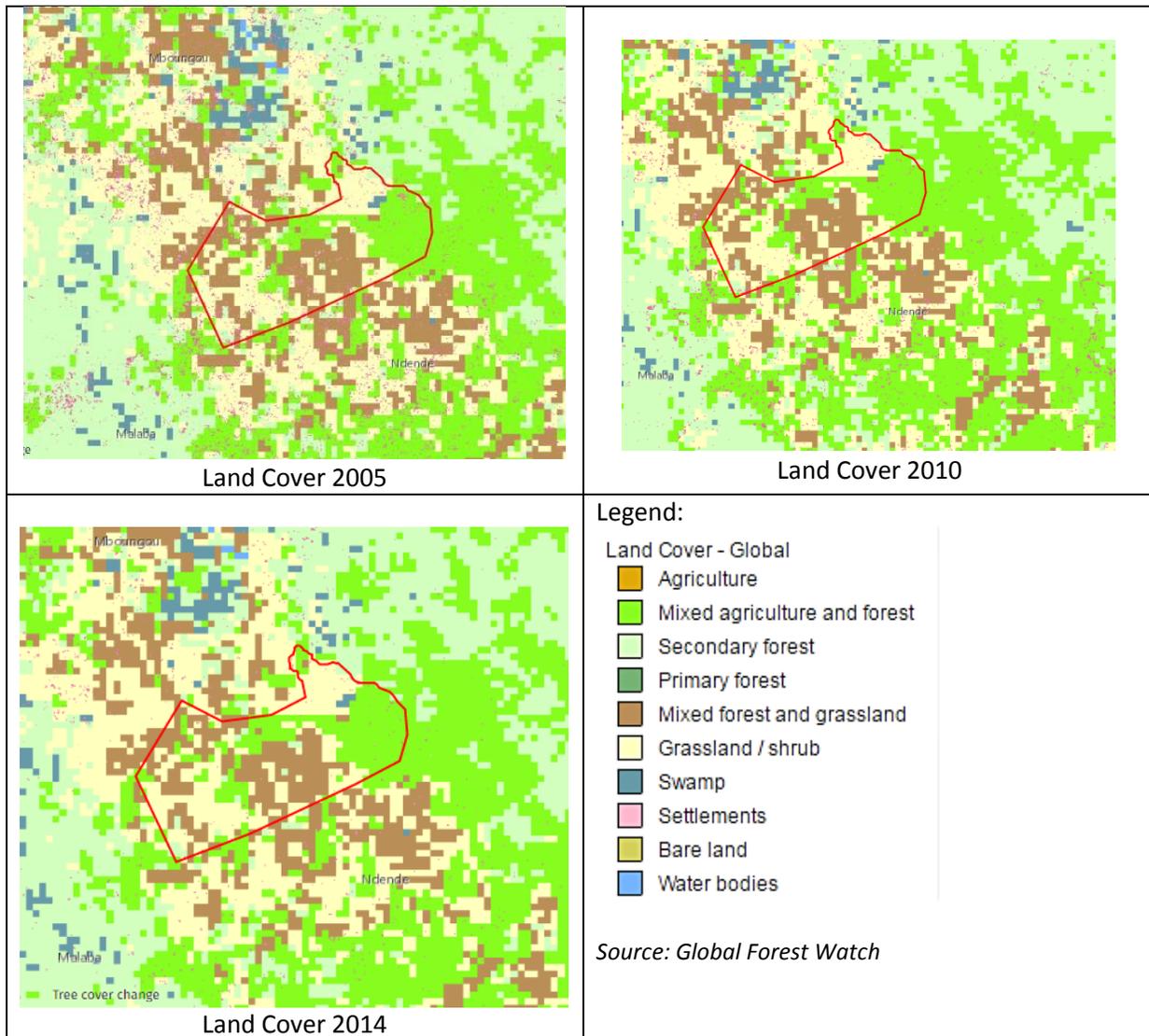


Figure 11: Carbon map for the Mouila Lot 3 Extension concession.

3.5 LUC analysis

Land use change analysis (LUCA) based on LANDSAT imagery was conducted to determine changes of vegetation since November 2005 using data from Global Forest Watch. The analysis report shows no clearance of primary forest since 2005 and HCV assessment has been conducted prior to new planting developments. The SEIA and HCV assessment results are aligned with the Landuse Change Analysis performed on Landsat imageries (see HCV maps above). In addition, OPG has conducted LiDAR mapping and field sampling as part of the SEIA and HCV assessment prior to land operation to further identify the vegetation.



The findings also shows approximately 87 ha of mixed agriculture and forest land were lost between year 2005 to 2014; including 33 ha that were cleared between year 2010 to 2014. It is important to note that these areas lost are not due to commercial clearance for palm plantation and it is most likely used by communities for subsistence farming.

Annual Tree Cover Loss (in hectares) on Land Cover - Global

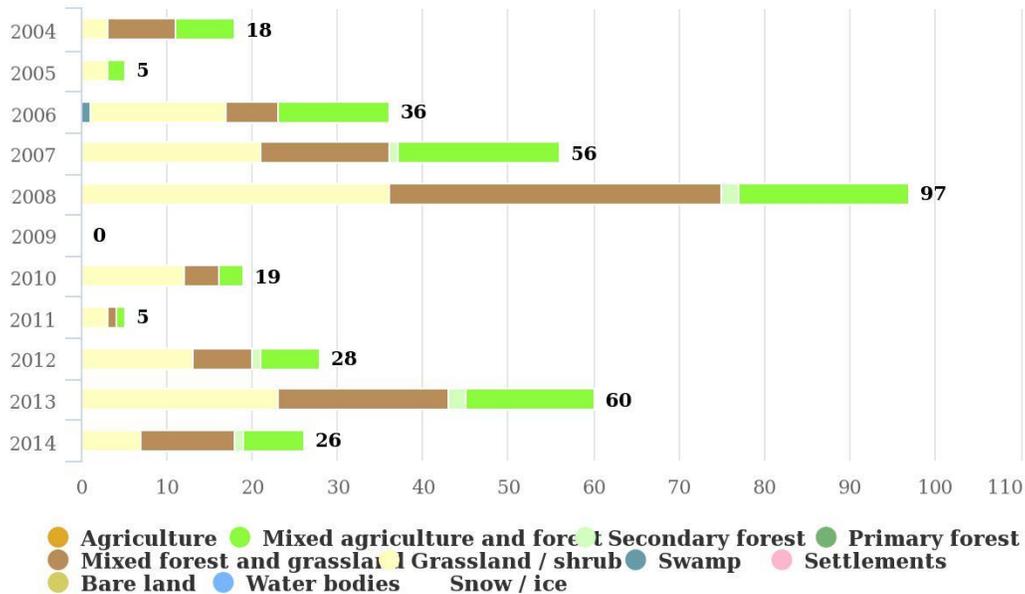


Figure 12: Analysis on vegetation lost based on data from Global Forest Watch

3.6 FPIC Process

The process to obtain FPIC among villages surrounding the concession is an on-going process which has commenced. From the 6 steps recommended for completing the FPIC process, each of which have several key components, the social team of OPG have completed the following actions against each step:

Step 1- ESIA: The ESIA has been submitted to the Director General of Environment (December 2016), subsequent to participatory mapping and multiple meetings and public consultations informing all stakeholders about the impacts of the project and addressing any concerns raised. The ESIA also includes a study for the impact of the project on subsistence activities (farming, hunting, gathering, collection and fishing) in and around the concession area and the recommended action to mitigate this.

Step 2-Elaboration of the FPIC process with stakeholders: The details of the FPIC process have been elaborated with local communities and relevant provincial and national government agencies. An information campaign on impacts of the project was completed in the first half of 2016. The registers are placed during the social contract negotiation. There are registers available in each village, in the office of OPG, and the Prefectures of Dola and villages potentially affected by the project have been notified of the complaint procedure. Furthermore a list of all stakeholders is maintained and a record of communications, consultations and actions arising from these, is regularly updated.



Illustration of community area on paper map, Mbadi Village, 7 May 2016

Step 3-Identification of stakeholders, definition of participative modes of consultations, representation and negotiations: A steering committee composed of village representatives, chiefs and departmental authorities have been established to monitor and guide the FPIC process. Procedures for communication, negotiation and complaints have been proposed, consulted on at the village level, and validated by the Steering Committee.

Step 4 -regulatory compensation of the persons affected by the project and estimation of compensation required: An agricultural inventory will be carried out to identify owners of crops and, farms at risk of conversion within the concession, allowing OPG to plan for avoiding these areas or compensation of owners in accordance to Gabonese law.

Step 5 – negotiations: Second phase of FPIC and negotiation are to be held during February 2017 to negotiate the free, prior and informed consent from the villagers based on the establishment of agreed compensations (regulatory and voluntary), land excisions or enclavement based on village needs, witnessed through a written Social Contract (which is a regulatory item appended to the Social and Environmental management Plan).

6. Step 6 – FPIC: Completion of the FPIC process is formalized through the signatures of all concerned parties on the Social Contract, and a traditional ritual ceremony. Execution of all completed steps (actions) is supported by documentary evidence signed by the relevant stakeholders and OPG.

CARTOGRAPHIE PARTICIPATIVE DES COMMUNAUTÉS DE MBADI

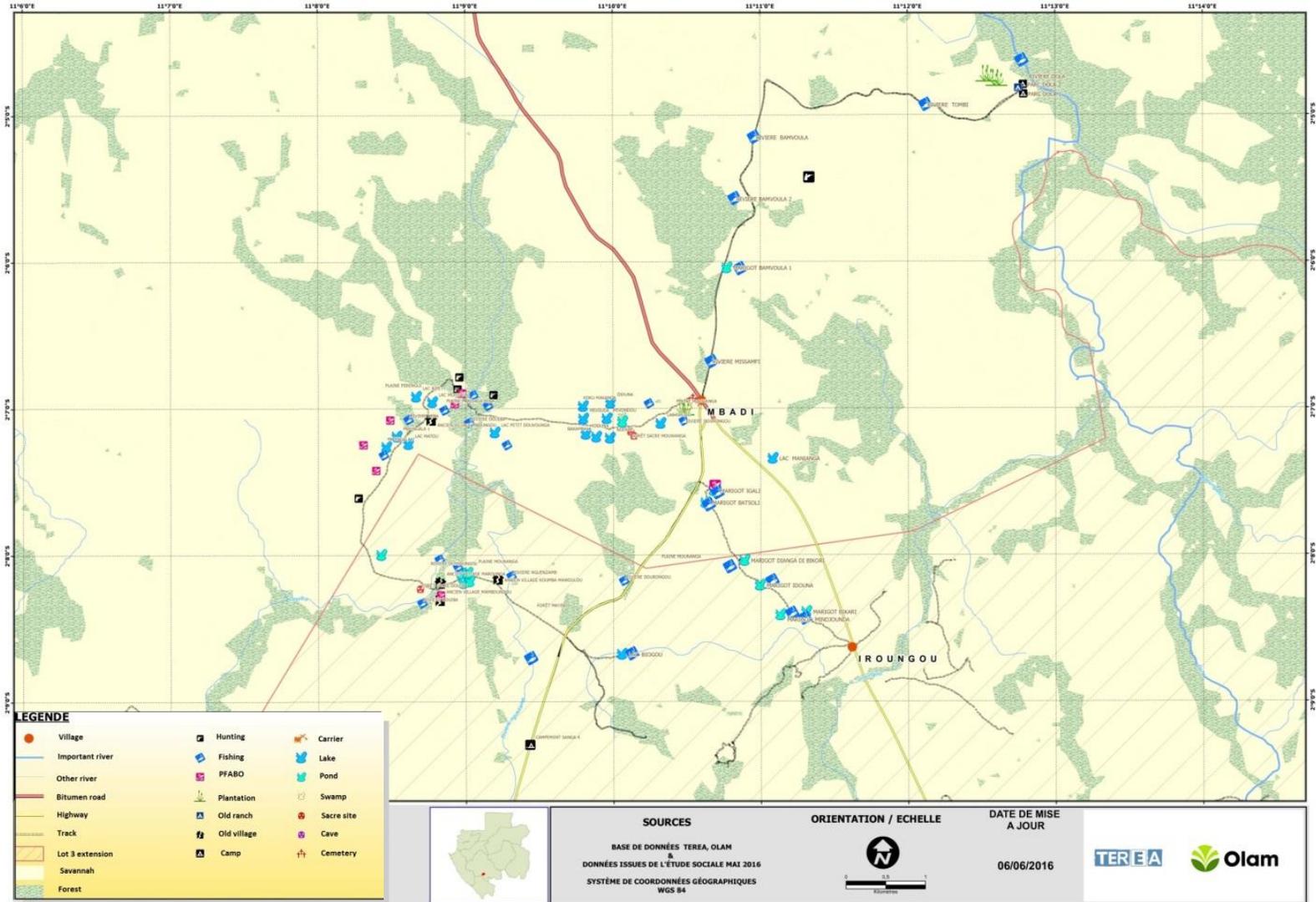


Figure 12: Participatory map validated by impacted villages

4. SUMMARY OF MANGEMENT PLANS

Summary of planning and management of Lot 3 extension area, including mitigation of emission impacts has been signed off by respective person in-charge and it is submitted as part of the NPP notification.

4.1 Team Responsible for Developing Management Plans

Table 11: Organizational information and personnel involved in planning and implementation

Contact Persons	Position	Entity
Supramaniam Ramasamy	Global Head of Plantations	Olam International Ltd
Gagan Gupta	Country Head	Olam Gabon
Quentin Meunier	Head of Environment and Sustainable Development	Olam Gabon
Olivier Desmet	Manager, Plantations CRS Function	Olam Palm Gabon
Sasitharan Mathavan	General Manager Mouila Plantations	Olam Palm Gabon
Pascal Mathieu	Manager, CRS Mouila Plantations	Olam Palm Gabon
Audrey Lee	Sustainability Manager	Olam International Ltd.

The plantations management is structured according to various roles and functions to ensure implementation of best agronomic, environmental, social practices and monitoring of ESMP, HCV management, social contract etc. Each of these divisions/ unit is managed by a manager, and assisted by assistant managers or executives.

4.2 Summary of Environmental Social Management Plan

Potential Impact	Proposed Enhancement/ Mitigation Measures	Measurement/ Adherence Indicators	Estimated Timeframe for Completion of Task	Frequency	Person Responsible
Erosion Prevention/loss of fertility	Demarcate and set aside areas with slopes above 20 degrees and hill forest area as permanent HCV areas	Areas marked in GIS database and left undeveloped	Prior to land clearing	Once during project duration	Plantations CSR Manager
	Windrow felled vegetation	Stacked vegetation between planting rows	During land clearing	Once during project duration	General Manager
	Terrace slopes between 10-20 degrees, in areas suitable for planting, to prevent erosion and facilitate greater retention of moisture	Terraced slopes	After land clearing	Once during project duration	General Manager
	Establish <i>Pueraria javanica</i> immediately after land clearing to ensure nitrogen fixation and prevent erosion	<i>Pueraria javanica</i> is established and maintained in recently cleared areas	Immediately after land clearing	Once during project duration Resupply during rainy season if <i>Pueraria javanica</i> is not established	General Manager

	Demarcate and maintain or restore riparian buffers according to width of water course to prevent chemical runoff and sedimentation	Riparian buffers are visibly marked GIS coordinates of buffer boundaries are available	Prior to land clearing	Once during project duration	Plantations CSR Manager
	Establish road construction plan	Plan takes into account topography and hydrological systems	Prior to land clearing	Once during project duration	General Manager
		Awareness programme on civil engineering best practices in place for machine operators	Prior to land clearing	Once during project duration	Training Manager
	Compact roads and use laterite, where possible, to stabilize the surface to reduce erosion until suitable surfacing is established	Roads are compacted and there is no significant erosion visible during rainy season	During land clearing	Continuously	General Manager
	Construct adequate drainage systems at regular intervals to drain and limit concentration of runoff (minimum of field drain to 8 rows); Pay particular attention to areas prone to flooding.	Drainage system is in place and is well maintained and clear of blockages Main drain outlets designed to minimise risk of sedimentation to minor rivers No flooding	After land clearing	Once during project duration	General Manager

	Establish a system for managing stormwater	Stormwater management system in place	After land clearing	Continuously	General Manager
	Construct sediment traps at regular intervals where needed	Sediment traps are established and maintained	After land clearing	Continuously	General Manager
Air Pollution	Spray access roads with water regularly to reduce dust emissions	Little dust covering vegetation along roads is visible	Continuous	During dry season if required	QEHS Manager
	Limit speed of vehicles and machinery to 40 km/h to reduce dust emissions	Warning system for drivers breaking the speed limit is in place No accidents resulting from speeding	Continuous	Continuously	QEHS Manager
	Prohibit idling of cars to reduce carbon monoxide emissions	No idling cars	Continuous	Continuously	QEHS Manager
Maintenance of Water Bodies	No clearance of forest galleries linked to hydrological network (see HCV 4 map), or wetlands as defined in existing SOPs	Verify limits of riparian galleries and wetlands on a block-by block basis and obtain field GPS points Demarcate limits of forest galleries and wetlands with paint Clear access road around main demarkated galleries and wetlands as appropriate.	Prior to land clearing	Once during project duration	HCV manager

	Identify physiochemical parameters for water bodies and establish a water quality monitoring and management plan.	Baseline assessment of parameters is provided Water Management plan is in place Water analysis reports are available	Prior to land clearing	Continuously (surface water analysis 3 times/ annum)	QEHS Manager
	Establish pollution prevention procedure which includes steps for clean-up in case of accidental spills or leaks	Pollution Prevention Procedure is available Monitoring records and corrective actions taken where spills have occurred are documented	Prior to land clearing	Continuously	QEHS Manager
	Water debit from courses will be calculated as well as the minimum flow in the stream selected for supplying water for the nursery and prenursery	Estimation of water debit available Minimum flow documented	Continuous	Continuously	Plantations CSR Manager
	A piezometer will be used for monitoring of the water table level	Record of water table levels	Continuous	Continuously	Plantations CSR Manager

	Demarcate and maintain riparian buffer zones around bodies of water and along rivers according to width (Refer existing SOPs).	Demarcation of buffer zones Rehabilitation procedure for accidental encroachments in place Riparian Area monitoring records are available	Prior to land clearing	Once during project duration	HCV Manager
	Plan all river crossings in advance according to operational need (no more than 2-3 crossings of each major river, minimum average spacing 2 km)	Road and bridge map is available	Prior to building crossings	Once during project duration	General Manager
	Crossings are bridged with appropriate methods (bridges, culverts) to avoid backing up and flooding in wet season (refer to best practices recognized by the FAO)	Construction teams are trained in river crossing Bridges and culverts are in place Banks are stabilised with vegetation or hard materials to prevent erosion	Prior to road construction and ongoing verification	Continuously	General Manager
	Train contractors and staff in proper felling techniques to ensure damage to riparian areas are avoided.	Training programme in place and attendance is recorded No non-conformities arise	Prior to land clearing	Continuously	Training Manager

	Avoid long-term diversion of water from its natural course	Corrective actions are taken where water courses have been diverted	During land clearing	Continuously	HCV Manager
	Maintain vegetation around wetlands (defined according to existing SOP) to prevent eutrophication	Monitoring records of water quality of water bodies Boundary of vegetation around water bodies is marked	Continuous	Continuously	HCV Manager
	Plan field drains and install sediment traps to ensure drains do not pollute or sediment watercourses	Map of main drains is available Drain outlets discharge into sediment traps or heavy vegetation.	During and after land clearing	Continuously	Plantations CSR Manager and General Manager
	No washing of vehicles in rivers and streams	Workers are given training and sanctions for breaching vehicle washing directives are applied	Continuous	Continuously	QEHS Manager
	Vehicle oil and filter changes are carried out in secure areas and away from water	Workers are given training and sanctions for breaching directives are applied Used oil and filter collection system is in place	Continuous	Continuously	QEHS Manager

	Process household waste water before discharging and monitor discharge areas	Records of water quality tests of discharge water	Continuous	Continuously	QEHS Manager
	Treat sewage from base camp prior to discharge	Sewage treatment plan is established Records of tests of discharge water	Prior to construction of housing	Continuously	QEHS Manager
	Construct concrete bunds around refueling and chemical storage/handling areas	Bunded areas are maintained	During infrastructure construction	Continuously	General Manager
Household waste management	Establish waste management and monitoring plan for household waste which takes into account the collection, sorting and storage of recyclables.	Documented Household Waste Management plan is available	Prior to development of housing	Continuously	QEHS Manager
	Provide closed trash receptacles in housing area	Closed trash receptacles are available No litter around housing area	During house construction	Continuously	QEHS Manager
	Establish a leak proof, covered landfill of 25x15x 2 m in accordance to waste storage	Landfill is established and complies with national regulations No leaks from landfill detected	During infrastructure construction	Continuously	QEHS Manager

	standards (Decree No. 541/PR/MEFEPEPN regulating waste disposal)				
	Inform workers and subcontractors about appropriate waste disposal	Interviews with subcontractors and workers reveal understanding of proper waste disposal No sightings of litter	Prior to land clearing/continuous	Continuously	QEHS Manager
Vegetative Waste	Windrow felled vegetation to ensure nutrients are returned to the soil	Vegetation is windrowed as stipulated in Agriculture Policy Manual	During land clearing	Once during project duration	General Manager/Regional manager
Ordinary Industrial Waste	Establish a waste management and monitoring plan for collection, sorting and storage of ordinary industrial waste recyclables; workers will be informed of proper handling and disposal of waste in the appropriate receptacle	Documented Industrial Waste Management Plan is available Monitoring records are available Corrective Actions, where taken, are recorded	Prior to land clearing	Continuously	QEHS Manager
	Inform workers and subcontractors about appropriate waste disposal	Minutes of meetings with workers and subcontractors available	Continuous	Continuously	QEHS Manager

		Interviews with workers and subcontractors reveal understanding of disposal procedure			
	Define procedures for control and clean up of any spills or leaks	Control and clean Up Procedures are documented Corrective actions taken as per procedures are recorded	Prior to land clearing	Continuously	QEHS Manager
Hazardous Industrial Waste	A waste management plan for the collection, treatment, storage and disposal of hazardous industrial waste will be established according to best practices	Documented monitoring plan and schedule for waste disposal are available Waste manifests are available	Prior to land clearing	Continuously	QEHS Manager
	Define procedures for control and clean up of any spills or leaks	Control and clean Up Procedures are documented Corrective actions taken as per procedures are recorded	Prior to land clearing	Continuously	QEHS Manager

	Inform workers and subcontractors about appropriate waste disposal	Minutes of meetings with workers and subcontractors available Interviews with workers and subcontractors reveal understanding of disposal procedure	Prior to land clearing	Continuously	QEHS Manager
Reduction of GHG emissions	Control and monitor consumption of oil for machinery, vehicles and use of generators	Monitoring records are available	Continuous	Continuously	Workshop Manager
	Carry out regular maintenance of vehicles and machinery	Documented maintenance history is available	Continuous	Continuously	Workshop Manager
	Limit land clearing to planned areas, and maintain and monitor buffer zones & other conservation forest areas	Map of protected areas and planting areas are available and specific instructions for clearing are documented and available	Prior to land clearing	Once during project duration	HCV Manager
	Whereever possible, low-polluting modes of transport will be used and fuel consumption will be controlled	Fuel consumption record is available	Continuous	Continuously	Workshop Manager

	Establish emissions reduction plan based on LUC and operations emissions baseline calculated using the Palm GHG calculator.	Documented plan is available	On completion of planting	Annual emission calculation	HCV Manager
Reducing Noise and vibration	Maintain all vehicles and mechanical equipment in good working condition according to manufacturers maintenance schedule	Documented maintenance history is available	Continuous	Continuously	Workshop Manager
	Equip machinery operators with mufflers for protection against loud noise	PPE Issuance Register Proper use of PPE in field by workers	Prior to land clearing	Continuously	QEHS Manager
	Train machinery operators in appropriate operating practices and raise awareness on physical stress related to operation of machinery	Minutes of meetings with operators and attendance sheet are available Operators are not affected by any physical stress from operation	Prior to land clearing	Continuously	QEHS

	Limit construction to daylight hours during the week to reduce noise to prevent excess disturbance of inhabitants of conservation areas and local communities	No activity outside of working hours	Continuous	Continuously	General Manager
Loss and disturbance of biodiversity	Implement land clearing plan which strictly limits development to areas identified for planting and infrastructure (See HCV Report and maps).	Land clearing plan is available Development does not infringe on set aside areas.	Prior to land clearing	Once during project duration	General Manager
	Demarcate HCV areas in the field and record in GIS database	HCV areas are demarcated in the field and GIS coordinates are recorded in database	Prior to land clearing	Once during project duration	GIS Expert/HCV Manager
	Monitor and maintain HCV areas, riparian buffer zones, and significant slope areas	Monitoring Reports are available Faunal Surveys are available	Continuous	Continuously	HCV Manager

	Develop a wildlife management plan which is aligned with Olam's existing partnerships	Records of meetings with experts Recommendations are taken into account in a documented management plan	Within first year of development	Once during project duration	HCV Manager
	Partner with the Department of Water and Forests and NGOs to manage HCV areas and enforce wildlife laws	Documented partnership agreement	Prior to land clearing	Once during project duration Revise partnership agreement if required	HCV Manager
	Prohibit hunting by foreign Olam workers at all times and by any worker during operating hours	Records of hunted species seized on site	Continuous	Continuously	HCV Manager
	Establish security posts along access roads and implement regular security controls	Records of species seized Patrol record	Continuous	Continuously	Security Manager
	Provide alternative sources of protein for foreign workers and partner with development organizations to develop animal husbandry programme in villages	Partnership agreement with local development organization and/or ranchers Roadmap for programme implementation Surveys of current protein consumption in villages completed	Within first year of development	Once during project duration Revise partnership agreement if required	Social Manager

	Limit width of roads crossing riparian areas to 8 m maximum and establish canopy bridges where feasible on main river crossings	Road width conforms to SOPs Canopy bridges are present on main crossings	During and after road construction	Once during project duration	General Manager, Plantations CRS Manager
	Limit operations to daylight hours allowing faunal species to move across the site at night	No activities outside of working hours	Continuous	Continuously	General Manager
Health and Safety	Implement QEHS Policy and Procedures	Documented QEHS plan available Procedures are posted where relevant Respect for work code of conduct in field	Continuous	Continuously	QEHS Manager
	Monitor and review effectiveness of QEHS Policy and Procedures	Minutes of QEHS Policy and Procedure Review meetings and corrective actions taken based on recommendations	Continuous	Continuously	QEHS Manager
	Equip and train workers on the use of appropriate Personal Protection Equipment	Minutes of meetings with workers Use of PPE in the field	Continuous	Continuously	QEHS Manager

	Train workers in first aid/emergency response	Minutes of meetings with workers Interviews with field staff reveal understanding of response procedure	Prior to land clearing	Continuosly	QEHS Manager
	Provide first aid kits at regular intervals throughout the plantation and in all vehicles.	First Aid kits are available and contents inside are within expiry dates	Prior to land clearing	Continuosly	QEHS Manager
	Report on and maintain records of LTA	LTA records are available	Continuous	Continuosly	Doctor
Storage, handling and application of Phytosanitary products	Train workers on responsible handling and application of phytosanitary products	Medical reports for any cases of mishandling of chemicals Records of training and attendance	Continuous	Continuosly	QEHS Manager
	Prohibit pregant or nursing women from applying phytosanitary agents and reassign them to maintenance of buildings and/or the creche	Procedure in place for relocating affected women Medical certificates are available	Continuous	Continuosly	QEHS Manager

	Conduct regular blood screening of workers responsible for application of phytosanitary agents	Records of screening available Procedure for taking corrective actions for any irregular screenings is available	Continuous	Continuously	QEHS Manager
	Inform workers about sicknesses related to the application of and exposure to phytosanitary products	Records of training and attendance	Continuous	Continuously	QEHS Manager
	Construct an eye wash/shower in the case of direct contact with chemicals	Washing stations accessible in storage areas	When chemical store is established	Once during project duration	QEHS Manager
	Label all products with relevant MSDS and post safe-use signage	Relevant labeling is clearly displayed All MSDS are posted	Continuous	Continuously	QEHS Manager
	Arrange products according to their application (ie. pesticide, herbicide, fungicide, miticide) in chemical store	Products are in specified places	Continuous	Continuously	QEHS Manager
	Construct an isolated, ventilated room for storage of phytosanitary products and restrict access to appointed personnel	Clearly signed, locked storage area No noxious smells	During infrastructure development	Continuously	QEHS Manager

	Adhere to the national system for the authorization of pesticides in order to limit the damage inflicted by pesticides on non-target species	Absence of contamination	Continuous	Continuously	QEHS Manager
	Justify and record fertilizer and pesticide inputs.	Records of fertilizer use are available Leaf sample analysis and pest census records are available	Continuous	Continuously As per OPG Policy Manual.	Agronomist/ General Manager
	Apply empty fresh fruit bunches as mulch on the plantation	Evidence of use of empty FFB	Continuous	Continuously	General Manager
Exposure to venomous/disease transmitting species	Reduce and prevent illness from insects by determining illness rates, intensity of contact risk with humans and monitoring populations of insects on the plantation	Baseline census of illness rates Insect survey are available Monitoring records are available	Continuous	Continuously As per OPG Policy Manual.	HCV & Doctor
	Anti-venom will be kept in the infirmary in the case of a snake-bite incident	Stock of anti-venom within expiry date	Continuous	Continuously	Doctor

	Workers who have been identified as suitable peer educators will be trained to identify venomous snakes in the area and how to care for snake bite victims	Record of training sessions	Continuous	Continuously	QEHS Manager
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4.3 HCV Threat Assessment

The HCV Assessment team carried out a threat assessment with the technical experts during the restitution workshop. Each HCV was examined and both the current and potential threats (should the proposed oil palm project go ahead).

HCV	Brief Description of Value Present	Main Threat
1	<p>Species diversity</p> <ul style="list-style-type: none"> • Kob populations (Southern reedbeek and Defassa waterbuck) • Two endemic species of fish, including one listed as Endangered by the IUCN 	<p>Current</p> <ul style="list-style-type: none"> • Destruction of habitat (mosaic of woodland and grassland, wetlands) • Overfishing/overhunting by the nearby communities <p>Potential</p> <ul style="list-style-type: none"> • Increased hunting pressure caused by influx of workforce, and displacement of hunting pressure into forest blocks outside the concession that do not fall within Olam's management • Loss of natural habitat • Loss of water quality due to nutrient leaching / fertiliser runoff or other pollution, sedimentation caused by river crossings • Increased fishing pressure caused by influx of workforce
3	<p>Important habitats</p> <ul style="list-style-type: none"> • Connected mosaic of savannah habitat types • Dolines / wetlands 	<p>Current</p> <ul style="list-style-type: none"> • None <p>Potential</p> <ul style="list-style-type: none"> • Clearance of savannah habitat • Fragmentation of savannah habitat, reducing the long-term viability of the savannah habitat and associated biodiversity • Clearance and drainage of wetland areas • Lowering of the overall water table due to excessive field drainage • Contamination of water sources in the area from chemical input in the plantation (rapid access to aquifer through higher water table and porous parent material)
4	<p>Basic ecosystem services</p> <ul style="list-style-type: none"> • Hydrological functions to maintain water 	<p>Current</p> <ul style="list-style-type: none"> • Low level forest loss due to clearing for subsistence agriculture and small-scale

	<p>quality and quantity for community uses.</p>	<p>logging/ timber extraction</p> <ul style="list-style-type: none"> • Roadworks along national highway <p>Potential</p> <ul style="list-style-type: none"> • Widespread loss of riparian forest due to land clearance for palm oil plantation (high level threat) • Loss of water quality and quantity due to loss of forest cover and service provision (erosion and flood control) • Loss of potable water supply downstream • Flooding • Water pollution due to fertiliser and pesticide use and waste disposal
5	<p>Basic Community Needs</p> <ul style="list-style-type: none"> • Provision of food from farming, hunting, fishing and NTFP gathering in the forest zone • Water supply to communities 	<p>Current</p> <ul style="list-style-type: none"> • Bushmeat supply is already dwindling as hunted species numbers appear to be in low numbers from overhunting <p>Potential</p> <ul style="list-style-type: none"> • Loss of fertile forest land for farming if riparian areas are replaced by oil palm. • Loss of access to traditional hunting, fishing and NTFP grounds • Reduction of fish stocks and loss of fish habitat due to impacts on water quality and quantity • Loss of potable water due to pollution.
6	<p>Cultural values</p> <ul style="list-style-type: none"> • Burial grounds • Sacred sites in forests (grove, cave...) • Lakes 	<p>Current</p> <ul style="list-style-type: none"> • none <p>Potential</p> <ul style="list-style-type: none"> • Loss of access • Damage to sites or resource from land clearance • Water contamination in sacred lakes and groves from chemical inputs and other pollution on the plantation

4.4 Management and monitoring recommendations

HCV	Threats	Management Recommendation	Monitoring Recommendation
1	<p>Overhunting and potential increased hunting pressure and displacement of hunting pressure with an influx of workforce on the planned plantation;</p> <p>Destruction of habitat;</p> <p>Overfishing with influx of workforce;</p> <p>Loss of water quality due to nutrient leaching / fertiliser runoff;</p>	<ul style="list-style-type: none"> • A dedicated survey is required to ascertain the status of populations of the reedbuck and Kob species within the concession. From this a more robust management strategy can be developed to ensure the long-term viability of the population -in which other options such as translocation can be considered. Olam should engage with ANPN on this. • Olam should consider supporting ex-situ populations of reedbuck and kob in either existing or new protected areas. • Engage with the appropriate local authorities to reduce illegal hunting inside and outside the concession, and put in place effective law enforcement procedures. During the FPIC process, discuss alternative options to commercial bushmeat hunting. Conduct education campaigns with the local communities. • A large block of savannah habitat should be set-aside with appropriate hunting regulations and savannah burning regimes to ensure protection of a population of reedbuck. • It is recommended that Olam contributes to a better description of the fish populations on site and in the area. Further sampling at different seasons to ascertain the presence of valuable fish biodiversity and inform the FPIC process could for instance be valuable in 	<ul style="list-style-type: none"> • Conduct annual monitoring of Kob/ Reedbuck populations, for instance using targeted recce surveys. Regularly monitoring of wildlife law enforcement e.g. using SMART platform. Conduct hunter surveys. • Annual monitoring of set-aside areas to show zero conversion of savannah or buffer zone set-aside. • Regular water sampling following BACI approach (upstream, in site and downstream) to preserve water quality: water quality parameters should remain within an acceptable range (similar to baseline values for microbiology and physio-chemistry recorded prior to land development) to preserve the fish habitat. • Further studies and on-going monitoring of fisheries in all the main rivers to ensure that HCV1 is maintained and enhanced. Ongoing monitoring should also inform on the presence of further endemic or IUCN listed species are present in the other watercourses: any finding should be fed back into the HCV management and monitoring plan. • A regular monitoring system needs to be established to ensure that forest cover is maintained and hunting and fishing pressure is kept at a minimal.

		<p>decision-making processes. In the absence of more information, the presence of HCV should be assumed and Olam should engage with local communities on the value present and develop a programme to mitigate the threat from overfishing.</p> <ul style="list-style-type: none">• The existing forest vegetation should be integrally preserved as a buffer against potential runoff. Additional buffers around the Dola (300 m either side) and its main tributaries should be delineated and managed appropriately.• Olam should have a programme in place in cooperation with local communities in order to mitigate the potential impact of a sharp population increase on fish stocks	
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3	<ul style="list-style-type: none"> • Clearance and fragmentation of savannah habitat; • Lowering of water table due to oil palm plantation too close to the dolines; • Contamination of water sources in the area from chemical input in the plantation (rapid access to aquifer through higher water table and porous parent material); 	<ul style="list-style-type: none"> • Olam must lead a process with Government to develop a Ngounié Savannah Conservation Plan to secure in the long-term key areas of this habitats at the landscape level, prior to any conversion. • Large blocks of savannah habitat should be set-aside that capture the range of savannah habitat types. Appropriate fire management regimes should be put in place to ensure the savannahs are maintained. • Olam should delineate all the wetlands on site before the start of planting operations and keep a buffer adequate to the size of the wetlands in order to protect water resources (see guidance for the size of buffer zones in the draft RSPO National Interpretation for Gabon). Appropriate management practices should be in place for all operations near dolines, wetlands and lakes. Develop dedicated SOPs for the above. Aquatic biodiversity studies of dolines should be carried out. • We recommend further botanical work in the wetlands in order to better understand these ecosystems. 	<ul style="list-style-type: none"> • Monitoring of savannah set-aside area and annual burns. Conduct annual census of bird assemblages in the savannah. • Regular water sampling and monitoring of the water table levels. • Regular review of implementation of relevant Olam SOPs • Develop and implement a Savannah Management Plan with support from MBG.
4	<ul style="list-style-type: none"> • Low level forest loss due to clearing for subsistence agriculture and small-scale logging/ timber extraction • Large scale forest loss due to land clearance for palm oil plantation (high level 	<ul style="list-style-type: none"> • Delimit, set-aside and protect existing riparian forests (these should be identified by following streams and tributaries to their source). Buffer zones should be at least 50 m on each side of the main tributaries of the Dola, and we recommend a precautionary 300m wide (on either side) of the Dola. 	<ul style="list-style-type: none"> • Establish network of independent water monitoring stations; • Regular monitoring of forest set-aside zones shows no encroachment by communities and operations; • Annual monitoring of set-aside zone shows at least no decrease in canopy cover;

	<p>threat)</p> <ul style="list-style-type: none"> • Loss of water quality and quantity due to loss of forest cover and service provision • Loss of potable water supply downstream • Flooding • Water pollution due to fertiliser and pesticide use 	<p>Where the riparian vegetation has been cleared within these zones, Olam should put in place active management measures to restore it. There are various small pockets of forest that are not directly riparian areas and can be cleared if less than 20 ha in size and if not connected to the river network.</p> <ul style="list-style-type: none"> • Ensure sufficient alternative land available for farming or compensation if there are no alternatives, and limit farming and logging in the forest buffer zones, in agreement with local communities, as per the FPIC process; • Olam should conduct further studies to locate caves in addition to those identified in the participatory mapping. Engage with Richard Oslisly from IRD/ANPN. These should be delineated and appropriate buffer zones and SOPs put in place. • Development and implementation of dedicated SOPs regarding chemical use • HCV sensitisation programme (internal & external) 	<ul style="list-style-type: none"> • Set restoration goal (natural regrowth) for riparian zone with annual milestones; • Regular review of implementation of relevant Olam’s SOPs;
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5	<ul style="list-style-type: none"> • Loss of fertile forest land for farming • Loss of access to traditional hunting, fishing and NTFP grounds • Loss of water quality and quantity due to forest loss • Water pollution due to fertiliser and pesticide use 	<ul style="list-style-type: none"> • Ensure sufficient alternative land available for farming or compensation if there are no alternatives; • Establish a community development programme to provide alternative food sources, with emphasis on availability of suitable protein; ensure controlled access for fishing; • Strict hunting SOP for all Olam and contracted staff and all local communities applicable inside the permit and appropriate buffer zones (i.e. to protect a known population of Cobe)- including zero tolerance to any form of illegal hunting (hunting methods and protected species); sensitisation and suitable training of all local communities inside the permit. • Control all hunting in forest zones coupled with provision of protein sources in the zone • Ensuring a continuous social engagement process to find mutually agreeable solutions to HCV 5 threats and formalise in codes of conduct and community engagement policies; 	<ul style="list-style-type: none"> • Establish and implement a participatory monitoring system to regularly track provision of basic needs to the community. There should be a clear mechanism for the findings of this participatory monitoring to be fed back into management measures in place (adaptive management).
6	Loss of access Damage to resource	<ul style="list-style-type: none"> • Enable all communities to have access to their HCV 6 sites; • Sensitise all communities that have identified any HCV 6 sites that are not on the validated HCV 5 & 6 maps; • Develop robust SOP for the identification, demarcation and enclavement and protection of all HCV 6 sites with the 	<ul style="list-style-type: none"> • Develop a simple HCV 6 monitoring system and ensure annual internal reporting against it;

		communities; <ul style="list-style-type: none"> • Ensure community member present when clearing operations occurring in any HCV 6 sensitive zones; 	
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4.5 Full HCV and HCV management area maps

Figure 11 shows the location of identified HCVs 1, 3 and 4 and their proposed management areas. Note that the HCV5 and HCV6 areas are shown separately in Figure 12, these are indicative only pending the consent of the local communities as per RSPO FPIC guidelines.

Table 12: Size of the HCV management areas

HCV 1, 3, 4	HCV 5,6	Total
7,823 ha	2,174 ha	9,466 ha

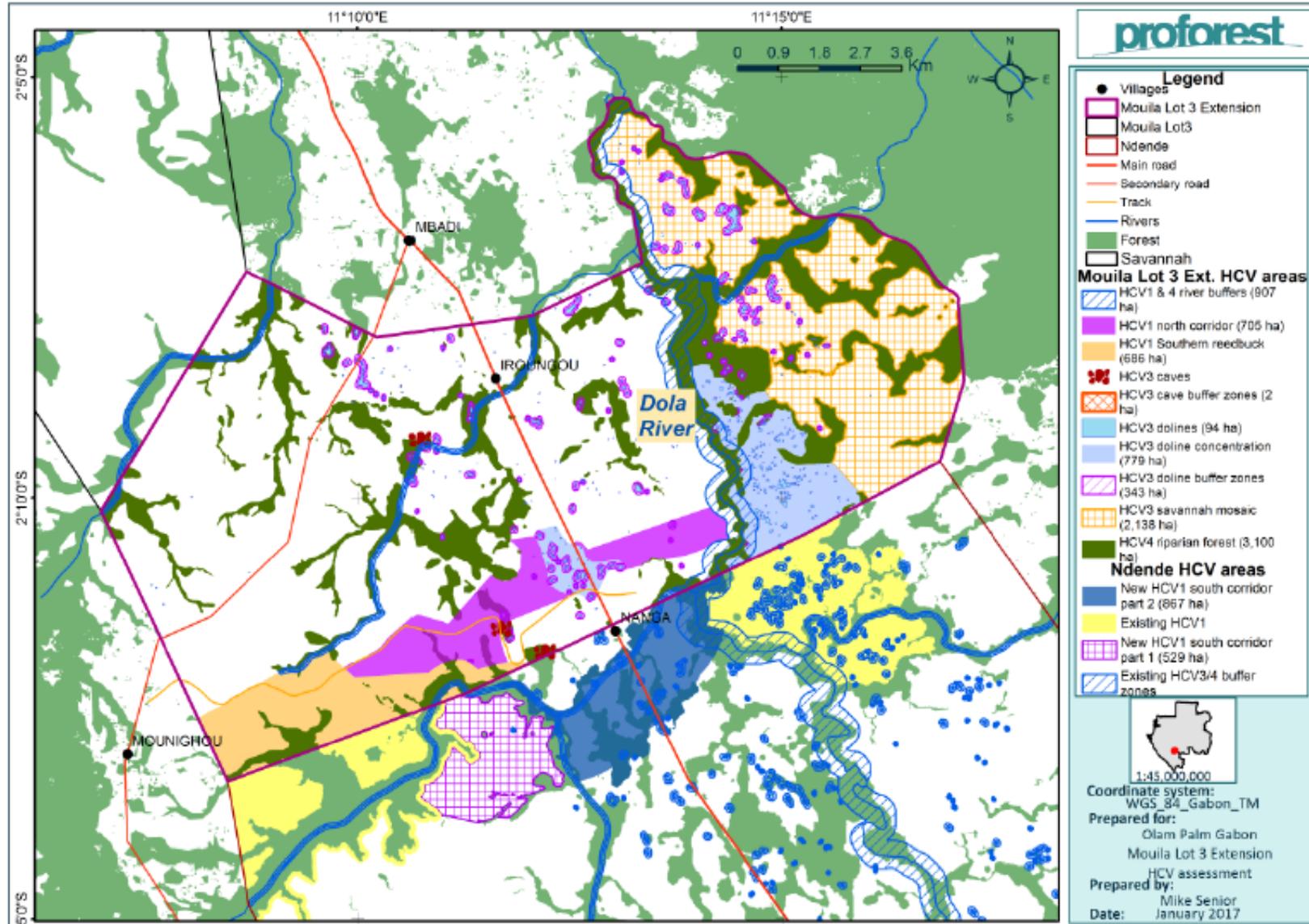


Figure 13: Location of High Conservation Values Areas (HCV1, HCV3, and HCV4) identified in Olam’s proposed Mouilla Lot 3 Extension concession. HCV areas in the adjacent concessions are included.

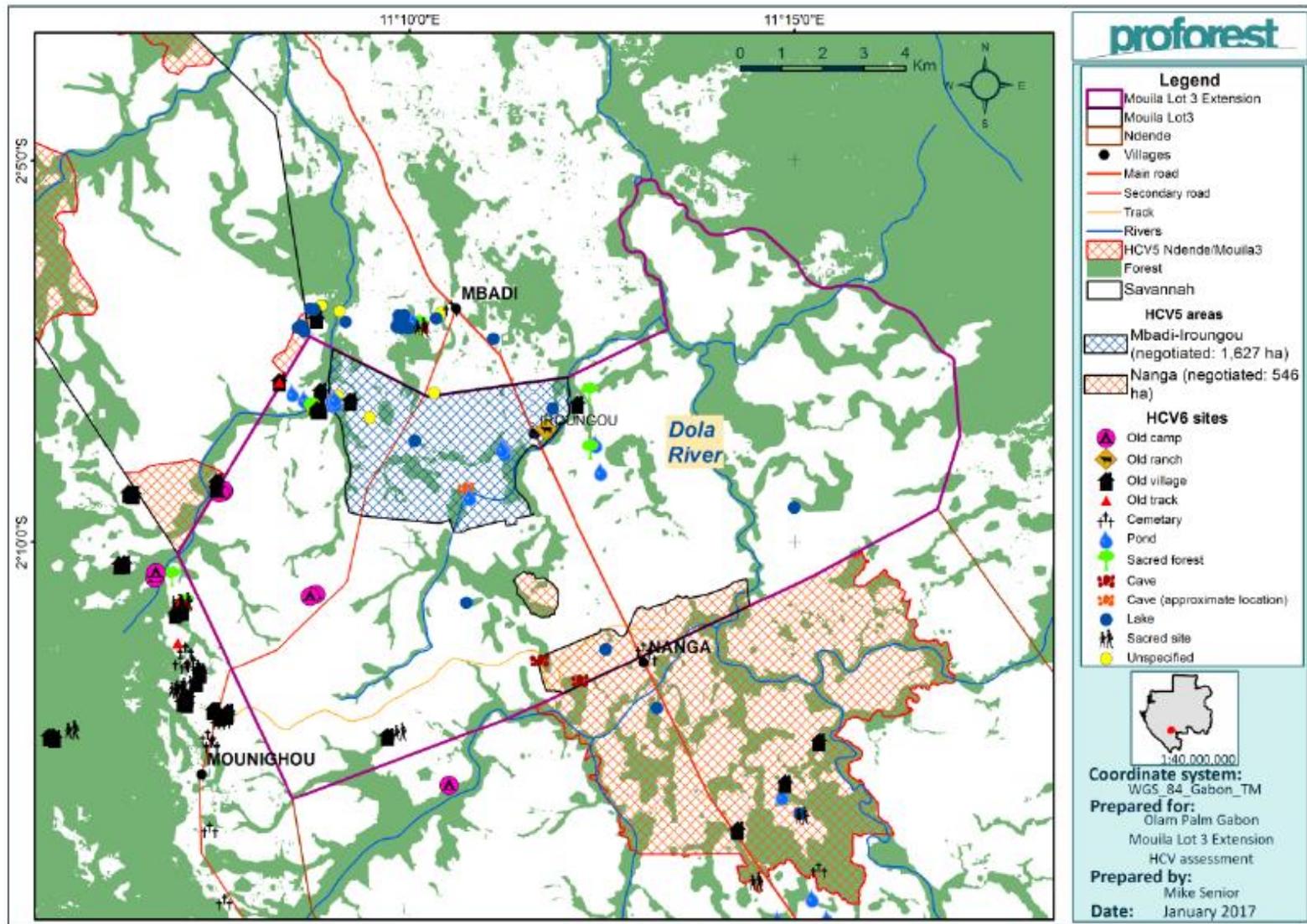


Figure 14: HCV 5 and 6 map. Olam has already carried out land consultations with the local communities. This map represents the agreed residual HCV 5 boundaries that overlap with the extension agreed with Mbadi, Iroungou and Nanga and Mouningou.

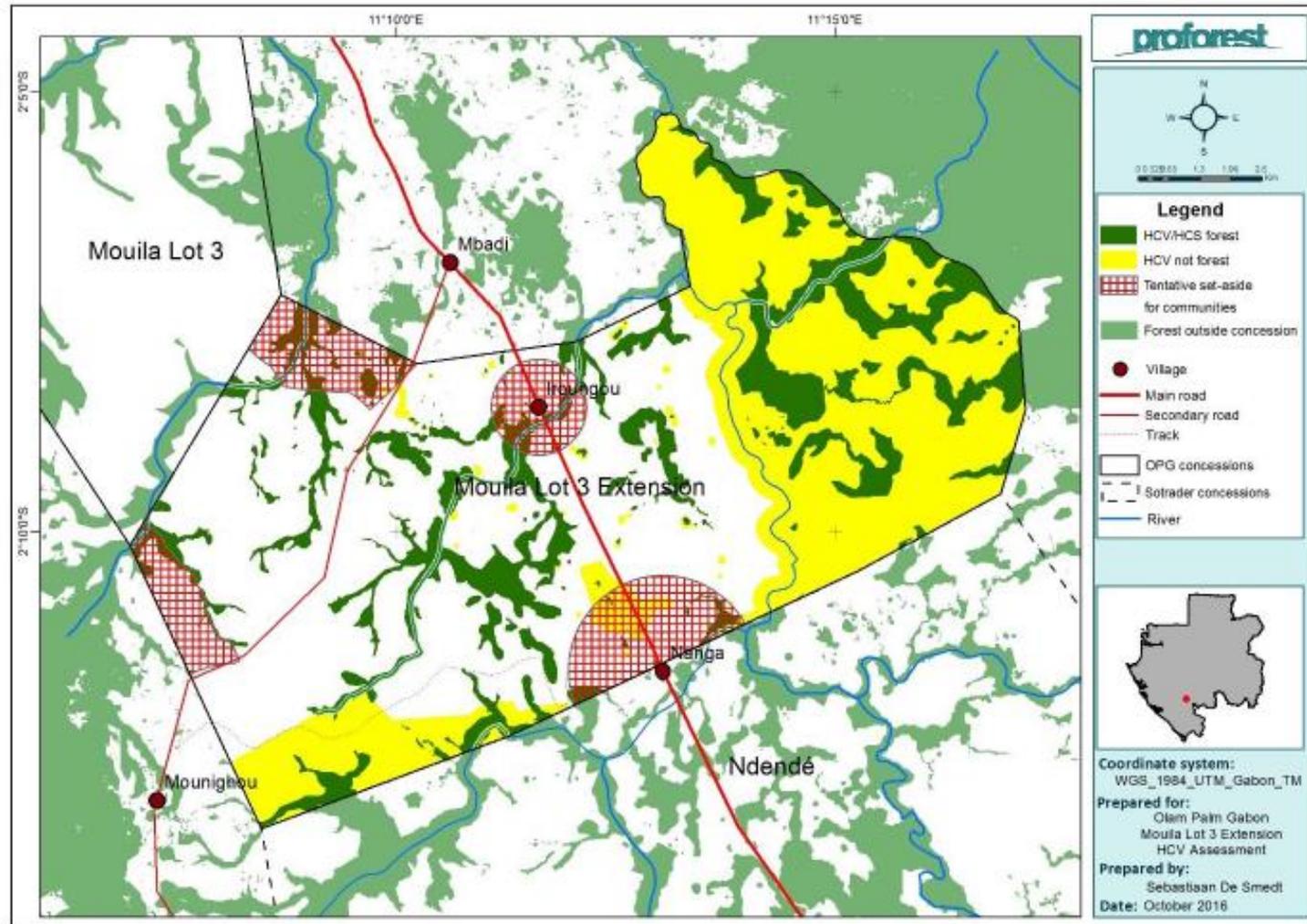


Figure 15: Integrated landuse map - Overview of the HCV, HCS and tentative set-aside areas for community use in the concession. The forest cover data was based upon ALOS/PALSAR remote sensing imagery made available by OPG / SOTRADER.

5. INTERNAL RESPONSIBILITY

This document is the summary of SEIA (Social and Environmental Impact Assessment) and HCV (High Conservation Value) assessments for the Lot 3 extension area and has been accepted by the Management of OPG. We the undersigned accept responsibility for the assessments and summary.

Formal Signed Off date for respective organization below: 21 February 2017

Signed on behalf of SEIA assessors
Terea, Gabon



Signed on behalf of HCV Assessors
Proforest Ltd, UK



DAVID HOYLE
PROFOREST.

Signed on behalf of OPG



Head – Environment and Sustainability, Olam Gabon
Quentin Meunier



CRS Manager Plantations/ Directeur CRS
Olivier Desmet

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