

RSPO NEW PLANTING PROCEDURES
Summary Report of ESIA, HCV
Assessments and Management Plan
Bindo Bifoun (Makouke), Olam Palm
Gabon

April 2019

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 181,096 ha through a public-private partnership between the Government of Gabon (GoG) and Olam International. This includes 18,613 ha of plantation acquired from SIAT (Société d'Investissement pour l'Agriculture Tropicale) in July 2016¹ which includes 5,488 ha of the Bindo-Bifoun concession which is the area considered under the RSPO's NPP.

Also included is 58,400 ha of schemed smallholder development project namely Sotrader Ndende under OPG's direct management.

The 5,488 ha Bindo-Bifoun (BB) concession was one of three concessions acquired in 2016 during OPG's acquisition of Société d'Investissement pour l'Agriculture Tropicale (SIAT)'s palm operations in Gabon. The other two, Makouké and Bindo were already under palm at the time of the acquisition, and have been under either palm or rubber since the end of the 50's.

Conversely, BB was undeveloped, except for approximately 600 ha in the southeast part of the concession that was cleared by SIAT between 2007 and 2013 and is now either under palm (347 ha) or is scrub or young regrowth vegetation (approximately 300 ha). The concession is located in the Province of Moyen Ogooué, approximately 140 km from Libreville and 35 km north of the provincial capital of Lambaréné.

Olam is abiding by a moratorium on land clearance until January 2019 and will furthermore continue its protection of HCV and HCS forests according to the HCV Network guidance and HCS Approach, or an agreed 'adapted' Gabon-relevant HCS approach endorsed by national stakeholders and RSPO (as per the Olam Living Landscape Policy commitments, 2018). Therefore, this assessment was conducted as an integrated HCV-HCSA assessment to identify both HCV and HCS areas. This report follows the HCV-only reporting template, because the assessment was completed before the HCVRN and HCSA had developed HCV-HCSA report quality review procedures.

The ESIA and HCV-HCSA assessments were conducted simultaneously. This HCV assessment used the HCVRN's Common Guidance on HCV Identification as a primary reference, with the Gabon draft HCVNI as a supporting guide to identify HCVs. The Gabon NI was used only as a supporting document as it is now quite outdated and was developed for forestry operations.

#UPDATE

On 10th June 2019, following our letter to the RSPO on 8th April 2019 for clarification on the NPP, Olam has decided not to proceed with any new development in the proposed new planting area, despite Olam's commitment and financial, time and HR investment. Based on the studies, BB was identified as fragmented and poorly connected landscape from an ecological perspective but fast growing species Parasolier formation has been identified as young regenerating forest under HCSA methodology as high carbon stock area. This shows Olam's challenge in implementing HCSA in a High Forest Carbon landscape.

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

1.1 Description of the assessment area

Name: Bindo-Bifoun concession

Location: Province of Moyen Ogooué, approximately 140 km from Libreville and 35 km north of the provincial town of Lambaréné, Gabon

Size: 5,488 ha

Scale and intensity: The majority of the concession is undeveloped, except for approximately 600 ha in the southeast part of the concession that was cleared by SIAT between 2007 and 2013 and is now under palm in various states of management or scrub/young regrowth (*Musanga spp.*). Olam anticipate developing as much of the concession area as possible as industrial oil palm plantation, based on the outcomes of the HCV assessment, HCSA assessment (including potential revision in the near future based on potential agreement of a Gabon 'adapted' HCS approach) and concession Land Use Plan. Therefore, the management scale is large, with a high management intensity as this entails habitat conversion.

Social context: There are 27 villages and settlements surrounding the concession on all sides, and a couple of non-permanent and now abandoned camps located within the concession, that will potentially be impacted by the development.

Out of 5488 ha's, 2794 ha's have been identified as HCV areas 1 & 4 and 941 ha's provisional HCV 5 & 6 areas that are pending negotiation

Location	Total Area (ha)	HCV and Buffer Zones (ha)	Area for Plantation (ha)*
Awala	20,030	12,482	6,810
Mouila 1	35,354	18,323	15,885
Mouila Lot 2	31,800	21,543	9,060
Mouila Lot 3 & Lot 3 Extension	38,363	18,765	18,272
Makouke*	18,707	1,319	5,733
Sotrader Ndende	58,400	27,278.5	30,000
Total	181,096	83,054.5	81,383

* Only conservation area established within replanting area. Does not include the areas under the BB NPP concession

Note: 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.

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Scenario 1: If Olam considers only HCV

<i>Activity</i>	<i>Area (ha)</i>
Total concession	5488
HCV 1	2031.9
HCV 4	1032.6
HCV 5 & HCV 6	941
All HCVs (taking into account overlaps)	3736.4
B) Plantable area excluding (C)	1664.02
C) Infrastructures and roads	87.58

Scenario 2: If Olam considers both HCSA & HCV

<i>Activity</i>	<i>Area (ha)</i>
Total concession	5488
HCV 1	2031.9
HCV 4	1032.6
HCV 5 & HCV 6	941
All HCVs (taking into account overlaps)	3736.4
HCS Forest (excluding HCV 1-6)	1,190.3
HCS Forest area total (including HCV overlap)	4,743.1
B) Plantable area excluding (C)	744.9
C) Infrastructures and roads	37.2

***Notes to area table:** All areas are approximate based on current assessments, and may change following further surveys and FPIC negotiations. Infrastructure and roads is estimated at 5% of concession area

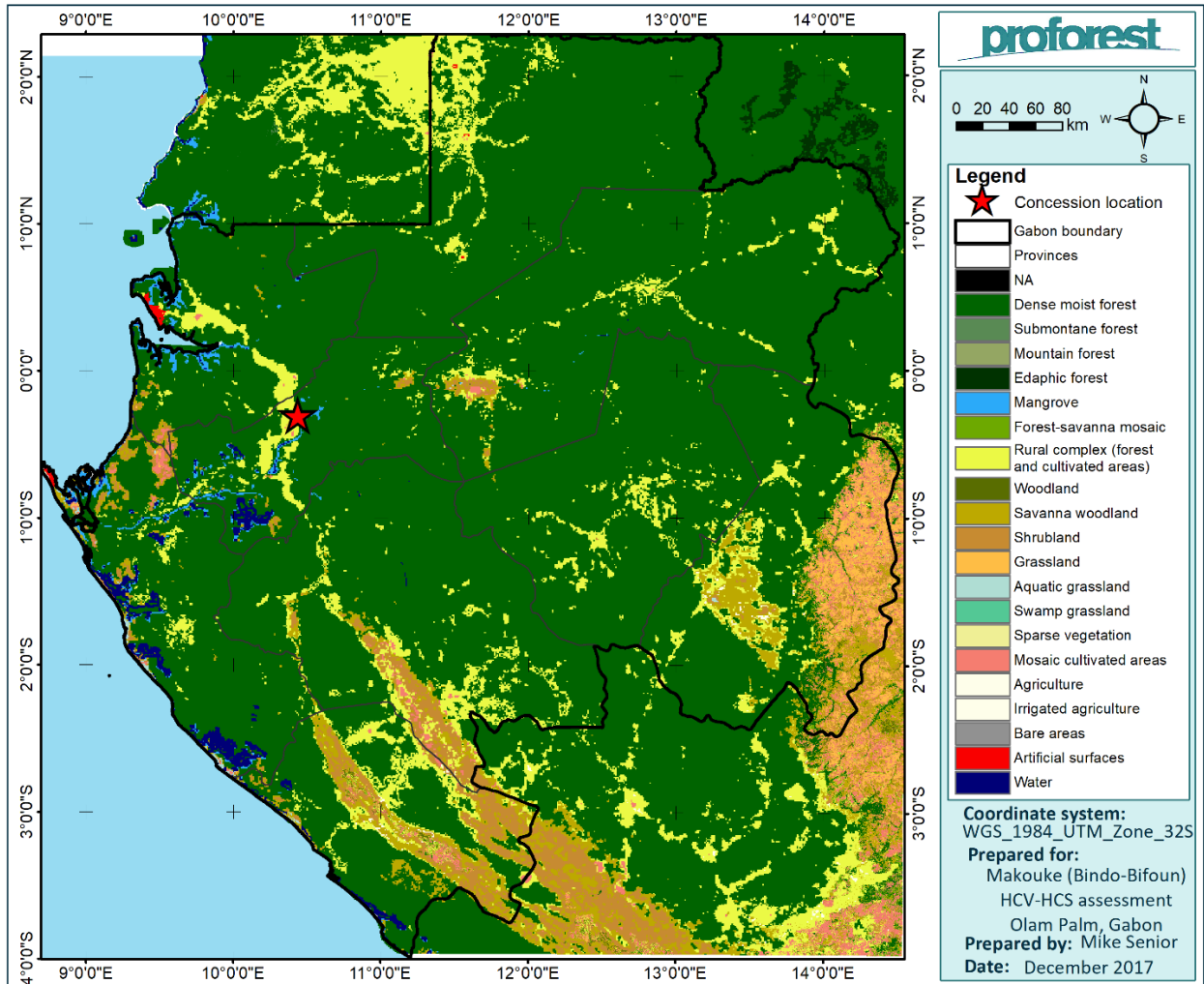


Figure 1: Location of the BB concession in Gabon, overlaid with 2012 land cover map for Gabon (Verhegghen et al 2012)

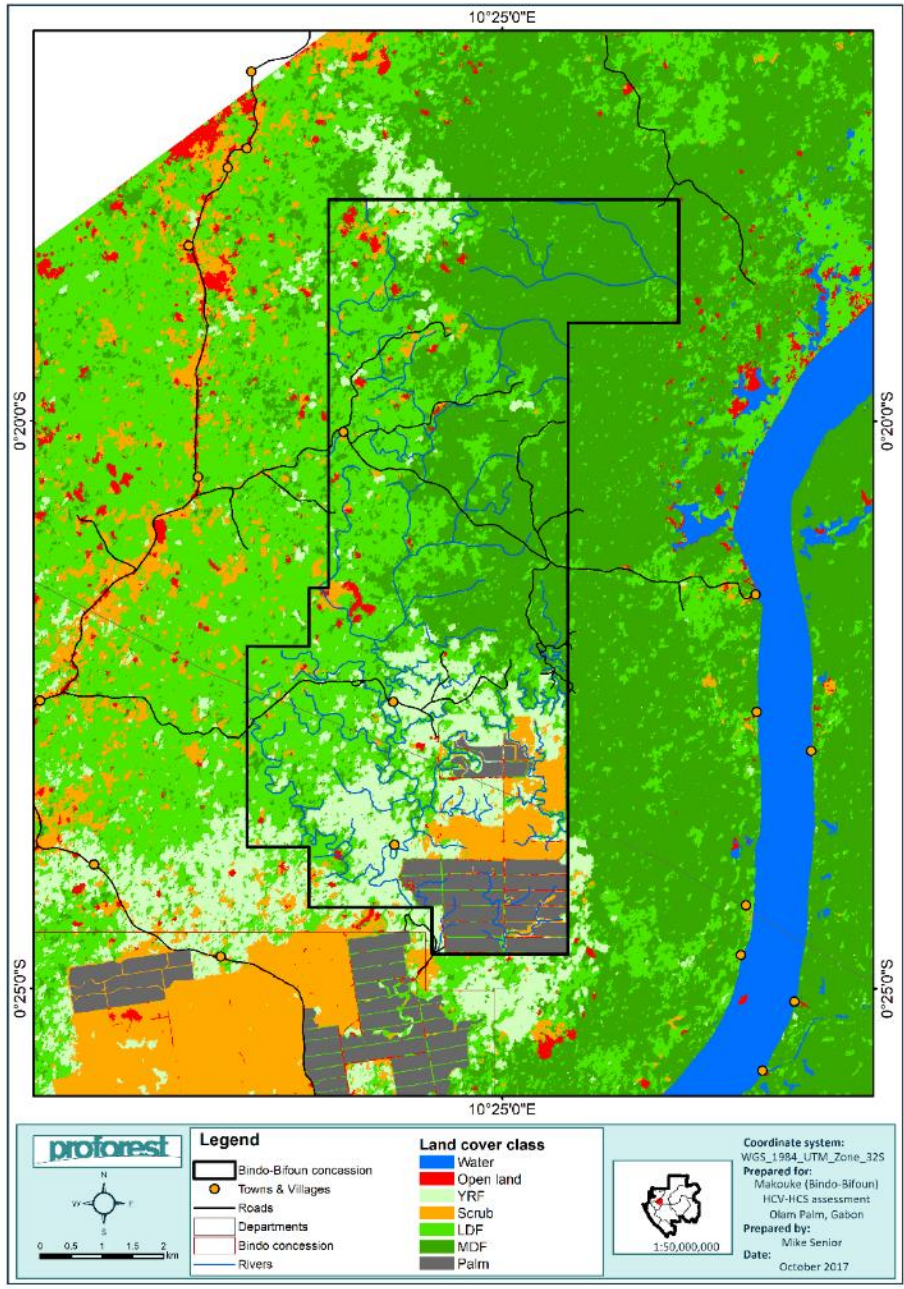


Figure 2: Land cover classification derived from 3m resolution PlanetScope imagery. YRF = Young Regenerating Forest, LDF= Low Density Forest and MDF = Medium Density Forest.

2. ASSESSMENT PROCESS AND METHODS

2.1 HCV Assessment

The HCV assessment was carried out by Proforest UK according to the requirements of the HCV Resource Network Assessor Licensing Scheme (ALS). Proforest is a unique, non-profit group that supports companies, governments and other organisations to implement their commitments to the responsible production and sourcing of agricultural commodities and forest products. Their team is made up of experts in the responsible production and sourcing of palm oil, soy, sugar, beef, timber and other agricultural and forest commodities²

This HCV assessment was conducted between March 2017 and January 2018, consisting of the pre-assessment (scoping) and full assessment phases. HCV assessments were previously commissioned for the BB concession by SIAT in 2007 and 2009, but Olam have commissioned a new HCV assessment to update the original assessments done before 2010 as required by the ALS. The HCV Assessment for BB extension has been approved by ALS Peer Review and Quality Control and posted on the ALS website³. The timeline of assessment and details of assessors are found in Table 1 and Table 2

2.2 Dates Assessments Were Conducted

Table 1: Timeline of Assessment

Phase		Task	Date
Pre-assessment		Information gathering	Mar-Apr 2017
		Scoping visit	May 2017
		Preparation and planning	Jun-Sept 2017
Full assessment	HCV identification	Botanical study	Aug-Sept 2017
		Mammal study	Aug-Nov 2017
		Aquatic study	Oct-Dec 2017
		Participatory mapping study	Aug-Dec 2017
		Socio-economic study	Oct-Dec 2017
		Physical environmental assessment (inc soil, water quality etc)	Nov-Dec 2017
	HCV findings and recommendations	Analysis and recommendations	Nov-Dec 2017
		Final national and community stakeholder consultations	Dec 2017
	Reporting	Reporting	Jan-Mar 2018

² <https://www.proforest.net/en>

³ <https://hcvnetwork.org/reports/hcv-olam-palm-gabon-at-bindo-bifoun-makouka-gabon/>

2.3 Methodology Used for Carbon Calculation

The assessment team carried out a desk-based review of existing reports and materials provided by Olam, remote sensing data, and other relevant studies about the environmental and social context (including the Bas Ogooué Ramsar site).

A preliminary land cover mapping of the proposed expansion site was produced using 3 m resolution imagery. This was updated after the full assessment and was developed using the vegetation classes from the High Carbon Stock Approach3: Open land (OL), Scrub, Young Regenerating Forest (YRF), Low Density Forest (LDF), Medium Density Forest (MDF), plantations and water. The HCSA classification system is not widely used in Gabon and so was also aligned with locally relevant classes.

Species-specific wood density was derived from World AgroForestry database and Zanne et al 2009⁴. Total aboveground forest biomass in each plot was calculated with the most recent pantropical allometric equation from Chave et al 2014⁵ as recommended by Prof Ngomanda as the most accurate for this forest type and location in Gabon

2.4 Assessors and FPIC experts

Olam Palm Gabon engaged TEREa, a Gabonese environmental consultancy, to conduct the ESIA in Bindo-Bifoun. 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 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. ESIA's are required by Gabonese regulations in accordance with Act No. 007/2014 of 1 August 2014 on the protection of the environment in the Gabonese Republic as well as the NPP. Participatory mapping is conducted as part of the ESIA process.

Table 2: HCV Team Members

Name and contact	Institution	Role	Expertise
Dr. Mike Senior mike@proforest.net ALS license: ALS17002MS	Proforest	Lead assessor	Conservation, Landscape ecology, GIS
Dr. Sebastiaan De Smedt	Proforest	Assessor	Conservation, GIS
Louis Defo	Proforest	Assessor	Social, community engagement
Ellen Brown	Proforest	Assessor & internal quality review	Conservation, Quality review

⁴ Zanne, et al 2009. Global wood density database. Dryad. Identifier: <http://hdl.handle.net/10255/dryad.235>.

⁵ Chave, Jérôme & Réjou-Méchain, Maxime & Burquez, Alberto & Chidumayo, Emmanuel & S. Colgan, Matthew & Delitti, Wellington & Duque, Alvaro & Eid, Tron & Fearnside, Philip & Goodman, Rosa & Henry, Matieu & Martinez-Yrizar, Angelina & Mugasha, Wilson & Muller-Landau, Helene & Mencuccini, Maurizio & Nelson, Bruce & Ngomanda, Alfred & Nogueira, Euler & Ortiz, Edgar & Vieilledent, Ghislain. (2014). Improved allometric models to estimate the aboveground biomass of tropical trees. *Global Change Biology*. 20. 3177-3190. 10.1111/gcb.12629.

Dr. Olivia Scholtz	Consultant (Independent)	Assessor	Conservation, Mammals
Aubin Mboumba	Consultant (TEREA)	Assessor and ESIA lead	Environment, Social issues
Laura Bachellerie	Proforest	Assessor	GIS

Table 3: ESIA Team Members

NAME AND CONTRACT	INSTITUTION	EXPERTISE
ESIA		
Aubin Mboumba	TEREA	ESIA coordination
Botanical inventory		
Pr. Alfred Ngomanda	IRET/CENAREST	Lead and quality control
Pr. Judicaël Lebamba	IRET	Field coordinator
Yves Issembe	Herbier National du Gabon	Botanist, para taxonomist
Fauna studies		
Pr. Alfred Ngomanda mailto:ngomanda@yahoo.fr	IRET/CENAREST	Lead and quality control
Dr. Etienne François Akomo Ookoue	IRET/CENAREST	Field coordinator, Mammals
Dr Fred Loïc Nguelet	IRET/CENAREST	Mammals
Blaise Mboye	IRET/CENAREST	Fish, Aquatic fauna
Social studies		
Eyang Effa Edwige	Research affiliate of IRET	Lead, Social, participatory mapping, community engagement
Owono Mbeng Ophélie	IRET	Social, participatory mapping
Guy-Roger Mbatouila	TEREA	Socio-economic studies

Table 4: Team of experts involved in the BB HCV and ESIA assessment

2.5 Assessment and FPIC Method

The assessment team carried out a desk-based review of existing reports and materials provided by Olam, remote sensing data, and other relevant studies about the environmental and social context (including the Bas Ogooué Ramsar site).

This HCV assessment was conducted between March 2017 and January 2018, consisting of the pre-assessment (scoping) and full assessment phases. HCV assessments were previously commissioned for the BB concession by SIAT in 2007 and 2009, but Olam have commissioned a new HCV assessment to update the original assessments done before 2010 as required by the ALS. Extensive participatory mapping has also been conducted previously for villages in the zone both by SIAT and for the government's GRAINE programme. This assessment built on the existing assessments, incorporating new secondary and primary data where relevant in order to fill any gaps.

2.5.1 Pre-Assessment

2.5.1.1 Information Gathering

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
- 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 WWF, IUCN, CARPE, Greenpeace and ANPN

2.5.2 Scoping Study

The scoping study was conducted in May 2017, with the field visit conducted by Dr. Olivia Scholtz and Aubin Mboumba, and Dr Mike Senior leading the reporting. The field scoping visit to the proposed oil palm development site at Makouké BindoBifoun was conducted from 22-26th May

2.5.3 Full Study

All studies were led by experts in their respective fields. Detailed methodology for soil survey, botanical survey, mammal survey, fish and aquatic invertebrate survey and socio-economic survey. Physical environmental survey including water quality and quantity sampling at 12 surface and 3 subterranean (bore holes) sampling points were done. Soil sampling was also conducted to determine soil structure/type and estimate infiltration rates. The details of the study are described in the HCV public summary report which is published on the HCVRN website.

2.5.4 Socio-Economic Study

A large number of participatory mapping and impact assessments had already been conducted for the villages around the concession that could be used for the study. To be precautionary the assessors and company agreed that additional updates or improved data were required for some but not all villages (e.g. for villages very far from the concession or known not to be using land inside or near the concession).

Socio-economic surveys were conducted by TERE A In total 21 villages (or 22 depending on how they are grouped) were included in the socio-economic survey and 14 in the participatory mapping study. More villages were included in the socio-economic survey than the participatory mapping study because no SIA or socio-economic baseline data was available for these villages, but these villages had been covered by previous participatory mapping exercises.

The socio-economic study involved collection of both qualitative and quantitative primary data based on group discussions at village/canton level (Focus Group Discussions: FGDs), village-level questionnaires, social transects and semi-structured interviews. Primary data was supplemented with secondary research such as official data from the local council (prefecture), government offices for health, police, fisheries and water and forest. This was all conducted with the objective of establishing a socio-economic baseline for the villages

2.5.5 Participatory mapping

Villages	Included in socio-economic study?	Included in p mapping study?	Status
Afock Bidzi	Y		Not impacted. Previous p mapping study showed not using concession area. Reaffirmed during socio-economic baseline study
Akok	Y		Not impacted. Previous p mapping study showed not using concession area. Reaffirmed during socio-economic baseline study
Amanegone	Y	Y	HCV 5 present
Bataillon (Edjé djéne)	Y	Y	Not impacted. Included in new p mapping study on precautionary basis. P mapping and socio-economic study showed not using concession area.
Benguie 1			Not impacted. Previous participatory mapping showed that Benguie 1 has no activities or use areas northeast of the Makouke/Bindo junction
Benguie 2			Not impacted. Previous participatory mapping showed that Benguie 2 has no activities or use areas north of the Makouke/Bindo junction. Therefore, use areas close to Bindo concession, not Bindo Bifoun
Benguie 3			Not impacted. Previous participatory mapping showed that Benguie 3 has no activities or use areas north of the Makouke/Bindo junction. Therefore, use areas close to Bindo concession, not Bindo Bifoun
Benguie 4 a & b	Y	Y	HCV 5 & 6 present
Bifoun	Y		Not impacted. Previous p mapping study showed not using concession area. Reaffirmed during socio-economic baseline study
Bifoun Zangwal	Y	Y	Not impacted. Included in new p mapping study on precautionary basis due to proximity to concession. But p mapping and socio-economic study showed not using concession area.
Bindo	Y	Y	HCV 5 & 6 present
Ebel Abanga, (rive droite et gauche)	Y		Not impacted. Included in new p mapping study on precautionary basis. P mapping and socio-economic study showed not using concession area.

Eyameyong (& Samkita)	Y	Y	Not impacted. Included in new p mapping study on precautionary basis. P mapping and socio-economic study showed not using concession area.
Fernan Vaz (Abo Okam)	Y	Y	Not impacted. Included in new p mapping study on precautionary basis. P mapping and socio-economic study showed not using concession area.
Ledouma			Not impacted. >5 km away from concession and on east of Ogooue river. Previous p mapping showed not using land west of river. Closer to Makouke concession.
Maguiéla	Y	Y	Not impacted. Included in new p mapping study on precautionary basis. P mapping and socio-economic study showed not using concession area.
Makouké	Y		Not impacted. >5 km away from concession and on east of Ogooue river. Previous p mapping study showed not using concession area. Closer to Makouke concession. Reaffirmed during socio-economic baseline study
Massoui-Eyen Assi	Y		Not impacted. Previous p mapping study showed not using concession area. Status reaffirmed during socio-economic baseline study
Mbilanten			Not impacted. >5 km away from concession, east of Ogooue river and further north - not using land in concession area
Mbolani	Y	Y	Not impacted. Included in new p mapping study on precautionary basis due to proximity to concession. P mapping and socio-economic study showed not using concession area.
Ngosso	Y		Not impacted. >5 km away from concession (not shown on map) and on east of Ogooue river. South of Bindo concession and activities close to Bindo not BB concession. Status reaffirmed during socio-economic baseline study
Ngouabilaghe	Y	Y	HCV 6 present
Paris Bifoun 1	Y	Y	HCV 5 & 6 present
Paris Bifoun 2	Y	Y	HCV 5 present
Bifoun 3	Y	Y	HCV 5 present
Saio	Y	Y	Not impacted. Included in new p mapping study on precautionary basis. P mapping and socio-economic study showed not using concession area.
Samkita			Part of Eyameyong village/regroupement

2.6 Assessment dates

The timeline for assessments are as follows:

Phase		Task	Date
Pre-assessment		Information gathering	Mar-Apr 2017
		Scoping visit	May 2017
		Preparation and planning	Jun-Sept 2017
Full assessment	HCV identification	Botanical study	Aug-Sept 2017
		Mammal study	Aug-Nov 2017
		Aquatic study	Oct-Dec 2017
		Participatory mapping study	Aug-Dec 2017
		Socio-economic study	Oct-Dec 2017
		Physical environmental assessment (inc soil, water quality etc)	Nov-Dec 2017
	HCV findings and recommendations	Analysis and recommendations	Nov-Dec 2017
		Final national and community stakeholder consultations	Dec 2017
	Reporting	Reporting	Jan-Mar 2018

3. SUMMARY OF FINDINGS

3.1 SEIA

3.1.1 Positive and Negative Environmental, Socio Economic Impacts

Scale and Intensity : Most of the concession is undeveloped, except for approximately 600 ha in the southeast part of the concession that was cleared by SIAT between 2007 and 2013 and is now under palm in various states of management or scrub/young regrowth (*Musanga spp.*). Olam anticipate developing as much of the concession area as possible as industrial oil palm plantation, based on the outcomes of the HCV assessment, HCSA assessment (including potential revision in the near future based on potential agreement of a Gabon ‘adapted’ HCS approach) and concession Land Use Plan. Therefore, the management scale is large, with a high management intensity as this entails habitat conversion.

Social Context: There are 27 villages and settlements surrounding the concession on all sides, and a couple of non-permanent and now abandoned camps located within the concession, that will potentially be impacted by the development

3.1.1.1 Positive Impacts

- Job Creation (about 300 direct jobs during operating phase) ;
- Creation of construction of social structures within the framework the social contract that results from the FPIC process
- Supporting village community projects including palm plantation in the village as well as for community projects like subsistence food farming, fish farming, livestock farming, etc.;
- The decrease in hunting pressure in the permit area (by employing traditional hunters and providing alternatives to bush meat);
- The additional taxes to be paid to the Gabonese State;

- Protection of specific ecosystems and/or ecosystem services within the landscape
- The discovery and defense of a zone of biological interest (Protection of endangered species, protection of areas of high carbon content, etc.);
- Recognition and protection of areas used by the community ;
- The revitalization of the villages in the project area;
- Reducing rural exodus.

3.1.1.2 Negative Impacts

During Field Preparation

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

During the construction of infrastructures (roads, bridges, life bases, offices, etc.)

- Potential Impact on air quality (flight of dust and greenhouse gases (GHG));
- Potential Impact on soil stability (erosion and destabilization);
- Potential Impact on water turbidity and aquatic environments;
- Impact on soils in the event of hydrocarbon leakage from construction equipment;
- Impact on the landscape
- Impact on water in the event of hydrocarbon leakage from construction equipment;
- Impact on animal and plant biodiversity;
- Impact on the safety and health of workers and residents at the project site
- Impact of waste production and management
- Potential Impact on local communities (destruction of areas of village culture, 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 phytosanitary products;
- Impact on water through the use of phytosanitary products 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 at planting.

3.1.2 Issues Raised by Stakeholders and Assessors

The assessment team carried out stakeholder consultations throughout the assessment process with stakeholders in Gabon, during the scoping visit in May 2017, during the full assessment from July to September and during final consultations in December 2017. Exact dates of consultations are included in the full assessment report, and a summary of main concerns is given here

May 2017 consultations. During the scoping visit, consultations were held to introduce the project, explain the assessment process, ask for initial concerns or recommendations to take into account when developing field methodologies. Consultations in Libreville were conducted with TNC, IRAF, Brainforest, ANPN, Direction Générale des Ecosystèmes Aquatiques (DGEA) and the DG Environnement et Protection de la Nature (DGEPN). Local consultations were held with village/canton chiefs in Mbolani, Botinane, Benguie 4a and b, Paris Bifoun 1, Paris Bifoun 2, Bifoun 3, Ngouabilaghe, Sayo, Samkita/Eyameyong, Bataillon and Fernan Vaz. The project was also introduced to local administration, specifically prefets and sous-prefets of Ndjole, Makouké and Lambaréné, and President of Conseil Departemental in Lambaréné.

July to September 2017 consultations. Over the course of the full assessment period, consultations were held to get feedback on initial findings from the scoping study, present more detail on field methodologies and to gather any other feedback. Consultations in Libreville were conducted with ANPN, Conseil National Climat, Ministère de la Forêt, de la Mer et de l'Environnement, IRDC Africa, Fensed, Patrice Christy (bird expert) and Dr Matt Shirley (crocodile expert). Comprehensive local consultations and interviews were held with representatives of all villages near the concession as part of the socio-economic and participatory mapping studies. These were supplemented by informal discussions and meetings conducted by the assessment team in various villages.

December 2017 consultations. After all expert studies were completed the HCV assessment team met with all of the discipline experts to review all findings and agree on preliminary HCV findings. Consultations were then held with stakeholders in Libreville and in each village to present HCV findings, maps of proposed HCV areas and management and monitoring recommendations. Consultations in Libreville were held with ANPN, Conseil National Climat, Ministère de la Forêt, de la Mer et de l'Environnement, IRDC Africa, Fensed, Patrice Christy (bird expert), WWF, TNC, IRAF, DGEPN and DGEA.

Main Concerns Raised	Inclusion in final assessment
<p>Essential to consider impacts on water quality and quantity, avoid any degradation of water quality in the Bas Ogooue.</p> <p>Ensure regular monitoring of water quality</p> <p>Olam must follow management and monitoring recommendations after reporting completed</p> <p>Olam should join management committee for the Bas Ogooue Ramsar site</p>	<p>Doubling of riparian buffer zones to avoid negative downstream impacts.</p> <p>Recommend high frequency monitoring of water quality</p> <p>Explained that RSPO audit process should cover this</p> <p>Recommendation passed on to Olam, who joined committee launch meeting</p>
<p>The proposed precautionary riparian buffer zones seem too conservative, could be smaller</p> <p>Compensation for communities should focus on securing their farmland and improving productivity, not on cash payments</p>	<p>Contradict feedback from other stakeholders. Larger, precautionary buffers to be kept</p> <p>Included as management recommendation</p> <p>Included as management recommendation</p>

Main Concerns Raised	Inclusion in final assessment
<p>A complete ban on hunting is unlikely to work – suggests employing main hunters to anti-poaching team</p>	
<p>Screening against indicative national HCV maps suggests Nile crocodile may occur. Should be investigated further</p> <p>Need for a more robust water monitoring system than usual</p> <p>Use national protocol for botanical inventory during full assessment</p> <p>Makes sense to retain a larger contiguous block further north rather to include the YRF where gorilla prints observed – gorillas would be moving around this wider area. Estimate required conservation area for gorillas and chimps based on approx. territory of 25km².</p> <p>Protection of the watershed draining from the east of the concession is important for the Ramsar site</p>	<p>Further consultation with Dr Shirley conducted and community consultation. Nile crocodiles highly unlikely to be present</p> <p>Included as monitoring recommendation</p> <p>Botanical inventory followed HCSA methodology which could not readily be aligned with national protocol</p> <p>HCV1 management area (MA) boundary revised to increase extent in north, and exclude YRF in south. MA is 20 km² but part of a larger 70 km² forest block that is considered adequate to support the great ape populations</p> <p>HCV1 MA will protect virtually all of this watershed</p>
<p>Minimise leaching into the groundwater</p> <p>Critical to have adequate riparian buffer zones</p> <p>Olam should help manage human-wildlife conflict</p> <p>Construction of roads, bridges in dry season must take into account river width & height in wet season</p>	<p>Recommend Olam monitor borehole water quality regularly & develop SOP for minimised fertiliser application</p> <p>Precautionary buffer zones recommended</p> <p>Included as recommendation related to HCV5</p> <p>Included as management recommendation</p>
<p>Reports should be made available in French with larger maps</p>	<p>Public summary will be available in french</p>
<p>Small seasonal streams not documented but often ecologically important and should be protected by buffer zones</p> <p>Should also sample fish in dry season in case species of interest using pockets of water that remain. This could be done after development if adequate buffer zones established to protect water bodies</p>	<p>All streams & rivers in the concession are small and seasonal. Recommend Olam to verify/remap all water bodies due to some inaccuracies found during field visit</p> <p>Included in management recommendations</p>

Main Concerns Raised	Inclusion in final assessment
<p>development/ceding their land so they can make an informed decision</p> <p>Ensure villagers can pass through the plantation to any HCV5 areas at any time of day (fitting with their daily calendar)</p> <p>Should train village representatives that can be focal points of engagement to explain processes and rights to other village members</p> <p>Capacity building required of Olam social teams in the field</p> <p>Compensation for villages should not be in cash terms</p>	
<p>Unlikely that they occur in the concession as Nile crocodile numbers on the Ogooué river near Lambarene were devastated by the crocodile leather trade in the 1900s, but there is a slim chance that they persist in some wet refuges (lakes or small rivers) away from the Ogooué. Suggested to interview fishermen to find out if they had encountered either Nile crocodiles or the other two species occurring in Gabon.</p>	<p>Village members interviewed during socio-economic surveys and informal discussions with villagers had not encountered Nile crocodiles, mentioning only dwarf crocodiles. Precautionary riparian buffers will nonetheless protect all waterways that would be Nile crocodile habitat</p>
<p>Confirmed the absence of Nile crocodile de Nile in the area.</p> <p>Olam should create platforms for eagle nesting as part of IPM</p> <p>Hunting should be banned completely</p>	<p>Not an HCV recommendation, but will be passed on to Olam</p> <p>Olam has a policy of banning all hunting in their concessions, but may need co-develop a strategy for the eventual HCV5 areas that recognises the traditionally high rate of hunting in the zone</p>
<p>Request that Olam employs young from the village and opens the road to the village that cross the concession.</p>	<p>Issues for Olam to decide during negotiations with the village members.</p>
<p><i>Participatory maps were validated with the village, but the final HCV consultation meeting was not conducted due to absence of the chef and representative village members</i></p>	<p><i>The area used by the village is an area planted with palm by SIAT, and so the community's use is not expected to be affected by Olam's ongoing operation in the area.</i></p>

Main Concerns Raised	Inclusion in final assessment
	<i>As part of the ongoing FPIC process led by Olam, TEREA will return to conduct the final validation meeting before any social contract is developed</i>
The village members completely refused to give consent to the project during the validation meeting.	Olam will not develop any land mapped as used by Benguie 4a or 4b.
Raised concerns that they would not be allowed to develop or use their farms in the concession. Request that Olam provides healthcare and improves the road.	The village's entire use area was mapped during the participatory mapping and will be subject to negotiation between Olam and the villages. Issues for Olam to decide during negotiations with the village members.
Asked why the 5km "green band" was not being used. It was stated that without this band the population might need to move elsewhere.	It was explained that this is no longer a legal requirement for concessions, but that the village's entire use area was mapped during the participatory mapping. Olam will need to engage with the villages to ensure that they have enough farm land to meet their needs.
They fear that they will be deprived of agricultural land, particularly for the production of plantains.	It was explained that farms were mapped during the participatory mapping and that they will not be converted by Olam unless agreed during negotiations with the villages.
Asked that the boundary of the concession is moved to be 5km from the village (in line with former legal requirement of "green bands" of 5km). Asked that young from the village are employed by Olam and that Olam constructs a school.	It was explained that this is no longer a legal requirement for concessions, but that the village's entire use area was mapped during the participatory mapping. Olam has said that local populations will be considered based on their competency for each job.

3.1.3 List of Legal Documents, Regulatory Permits and Property Deeds

A long-term agriculture lease (Portant Concession D'un Bail Emphyteotique) signed between the SIAT Gabon represented by Mr. Pascal Desmedt and the The National Agency of Town Planning, Topographical Work and Cadastre (L'Agence Nationale de l'Urbanisme, des Travaux Topographiques et du Cadastre (ANUTTC) dated 15 April 2016.

3.2 HCV Assessment

A draft Gabon HCV national interpretation (HCVNI) was developed by forestry stakeholders in 2008. This toolkit has been used in certification processes resulting in successful FSC certification for forestry companies in Gabon.

This HCV assessment used the HCVRN's Common Guidance on HCV Identification as a primary reference, with the Gabon draft HCVNI as a supporting guide to identify HCVs. This was done because the Gabon NI is now quite outdated and was developed for sustainable forest management and not land conversion to large agricultural production landscapes. Use of these reference documents was coupled with recommendations of local stakeholders and experts.

3.2.1 Decision on presence or absence for all 6 HCV areas

Table 5: Summary of HCV in the Bindo-Bifoun 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		
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			Absent
3	Rare, threatened, or endangered ecosystems, habitats or refugia			Absent
4	Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes	Present		
5	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples...	Present		
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		

3.2.2 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 forests and freshwater ecosystems of Bindo-Bifoun concession can be considered likely to support nationally significant concentrations of species, based on field surveys, literature review and expert opinion.

Interpretation in the Bindo-Bifoun concession

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 and justification

Faunal: birds

Two avifaunal studies conducted in the BB concession in 2009 by Patrice Christy and by the EIA consultants (PB Consultants) identified a total of 216 bird species in the concession. The results summarised in the avifaunal reports and the 2009 HCV report by CIRAD make clear that the bird species recorded were species found throughout Gabon's forests, without presence of any species rare or threatened at the scale of Gabon. Note that the extent and quality of forest in the BB concession has declined further since this study was conducted.

The only species recorded in the concession included on the IUCN Red List was the African grey parrot (*Psittacus erithacus*), which is listed as Endangered, is also a protected species in Gabon and is included in CITES Appendix I. Grey parrots were not observed to be present in nationally significant concentrations or in aggregations in the concession – according to the bird expert P Christy who conducted the 2009 bird survey. Christy noted that they may aggregate seasonally to roost in raffia palms along the Ogooue River, but that no raffia stands are present in the concession and raffia stands are associated with wetland/swamp forests that are most prevalent downstream of the Aol in the Ogooue and Lacs wetland complex.

The main threat to grey parrots comes from illegal collection for the pet trade, in combination with habitat conversion. Concerns have been raised about increased collection and trade of African grey parrots (AGP) in Gabon with Gabonese officials involved in calls to up-list the species to CITES Appendix 1.⁶ Gabon remains a stronghold for AGPs (as for many RTE species), and without doubt the national population is of global significance given rapid declines elsewhere. However, they should only be considered HCV 1 in Gabon should they occur in significant concentrations. Overall, the presence of AGP individuals in the Aol is not considered HCV 1 for the following reasons:

1. The species was not observed to be present in large flocks or aggregations in the concession – with the only potential areas that may support such aggregations in the wider landscape being raffia palm stands along the Ogooue River. Therefore, the population of AGP cannot be considered significant at the scale of Gabon – as for other species, given that the forest in the Aol is amongst the most degraded in Gabon,
2. AGPs remain abundant in Gabon and are found throughout, even in and around the capital Libreville,

⁶ CITES COP17 24 Sept – 5 Oct 2016. Proposal 19: <https://cites.org/sites/default/files/eng/cop/17/prop/060216/E-CoP17-Prop-19.pdf>

3. Evidence suggests that parrot trade remains limited to fairly small pockets near the Cameroon and Congo borders and the level of export from Gabon is reported to be low,³¹ and at present there is no evidence of a major decline in AGP populations in Gabon⁷.
4. There was no evidence of AGP trapping or trade in the villages surveyed in the Aol, and
5. AGPs are generally wide-ranging and mobile – able to travel long distances for food and nest sites. Oil palm fruits are also a preferred food source, therefore, some oil palm development may actually benefit the species (P. Christy Avifauna report 2009). This is supported by research from Cameroon which has found that AGPs can live and breed in tree or cocoa plantation areas where large trees and adequate forest cover remains in the landscape (Tamungang, et al. 2016; Koungoum Piebeng, et al. 2017).

Although African grey parrots are not considered HCV 1, it should also be noted that the HCV management areas identified in this assessment includes all of the higher quality forest inside the BB concession which will no doubt support the highest density of potential nest trees for AGPs and, with adequate hunting controls, this area can help to protect AGP individuals using the area.

The other four IUCN threatened species found in Gabon were not recorded in the concession, and are not known to occur in the zone. There is only one potential endemic bird species in Gabon, that is restricted to the Batéké plateau and therefore not present in this zone. Furthermore, the only forest species recorded that may form seasonally concentrations is grey parrots that can nest in raffia palms in riparian areas (P. Christy 2009), however, no raffia palm formations occur in the concession and are predominantly found downstream in the Ogooue and Lacs wetland complex.

Christy notes that seasonally important concentrations of birds in Gabon are most significant for aquatic and coastal birds. One of the criteria for the gazettment of the Bas Ogooué Ramsar site is the presence of important seasonal concentrations of aquatic bird species. However, none of the key aquatic species found in the Ramsar site were recorded in the BB concession – which was found to support exclusively *terra firme* vegetation. Further to this, the concession does not lie in or near any of the priority bird areas that have been identified by experts for the Bas Ogooué Ramsar site.⁸The only species of potential interest mentioned in the avifaunal study was the grey pratincole (*Glareola cinerea*), but this is restricted to sand banks along the Ogooué river.

Overall, the avifauna found in the concession and its Aol is not considered HCV1.

Faunal: mammals

The mammal survey revealed a very low abundance and diversity of mammals at the scale of Gabon, with only 15 mammalian species recorded during the recces and camera-trapping (The vast majority of species recorded were common and widespread species frequently encountered. Abundance is low compared with forests in National Parks (although the density and diversity (as well as signs of hunting) did increase towards the east of the concession in the more intact forest. The relatively depauperate mammal community, by Gabon standards, appears to be the result of a high hunting pressure in the zone, with only the more resilient species persisting in the eastern half of the concession.

⁷ <http://datazone.birdlife.org/species/factsheet/grey-parrot-psittacus-erithacus/text>

⁸ (J. e. Vande weghe 2015). Le Duc Yéno S., 2015. Atlas cartographique du site Ramsar du Bas Ogooué. WWF Gabon – MBG – WCS – IRD. Inventaire multi-ressources du massif forestier d'Evaro. Projet d'appui à la gestion.

The African manatee (*Trichechus senegalensis*) and hippopotamus (*Hippopotamus amphibius*) are flagship species for the Bas Ogooué Ramsar site and manatees rely on certain habitats seasonally for breeding, but were not encountered in the site during any of the surveys nor mentioned during village consultations/interviews. This aligns with provisional distribution maps developed by ANPN, and confirmed during consultations, showing that the hippopotamus is limited to the downstream stretches of the Ogooué river and the manatee to the Ogooué River and downstream delta. Both species (and seasonally important habitats) are considered absent from the concession. Gabon's three endemic mammal species do not occur in this part of Gabon (Vande weghe et al 2016).

Despite the overall low density and diversity of mammals recorded, several potential HCV1 species were found to occur in or near the concession:

- IUCN Critically Endangered **western lowland gorilla (*Gorilla gorilla*)**: footprints of what appeared to be a small-family group were observed by part of the HCV assessment team, and identified by Olam's HCV staff, in YRF/parasolier forest towards the south-eastern side of the concession (
- IUCN Endangered **chimpanzees (*Pan troglodytes*)**⁹: 3 chimpanzee individuals were recorded by the camera traps in the eastern MDF forest,
- IUCN Vulnerable **African elephants (*Loxodonta cyclotis*)**: footprints and dung of elephants were observed to the east of the concession near to Ngouabilaghe village on the Ogooué river (**Error! Reference source not found.**). The village head confirmed during informal discussions that they do pass through the zone relatively frequently.

Nationally protected **water chevrotain (*Hyemoschus aquaticus*)**, **sitatunga (*Tragelaphus spekii*)** and **red river hog (*Potamochoerus porcus*)**: the mammal team found a red river hog skull in the northeast of the concession and observed a water chevrotain visually as well as chevrotain scat in the northeast of the concession, as well as an additional scat in the southeastern part. Sitatunga was recorded by camera-trap in the eastern part of the concession. The 2009 HCV assessment also reported giant pangolin to be present, but no evidence of their presence was found either during the mammal surveys or during community interviews



Figure 3: Gorilla footprint observed in the southeastern corner of the concession

⁹ (IRET, Inventaire de la faune mammalienne dans la Concession de OLAM PALM Gabon à Makouké 2017)



Figure 4: Elephant dung to the east of the concession

Based on only low rates of capture of these RTE and protected species, it was not possible to estimate population densities. Comparison with encounter rates from a National Park in Gabon shows that species encounter rates were generally much lower in the BB concession. However, virtually all observations of these species were in a similar area, in the medium density forest (MDF) in the eastern part of the concession. This area supports a higher mammal diversity and abundance than the more degraded western section of the concession, presumably because higher human activity and habitat degradation from the west has driven these more sensitive species to the east. Signs of hunting were also highest in the east, suggesting that hunters are seeking out better hunting grounds.

Species	Encounter rate/km Bindo Bifoun concession	Encounter rate from recce-transect study in Ivindo National Park ¹⁰
White-nosed monkey <i>Cercopithecus nictitans</i>	0.136	0.54
Medium-sized duikers	0.051	1.61
Small-sized duiker	0.442	0.13
Red river hog <i>Potamocheirus porcus</i>	0.017	0.31

Table 6: Encounter rate of some of the more abundantly encountered species in the concession

Given their presence throughout the vast majority of Gabon, the low density of these species in this eastern zone does not represent a significant concentration at a national scale, however, the co-occurrence of multiple RTE species, in particular chimpanzees, gorillas and elephants is of some note and can be considered of conservation interest at a regional and global scale.

This eastern forest block forms a contiguous block of approximately 7,000 ha of MDF bounded to the north by the national road and Abanga River, to the east by the Ogooué River and to the south by Olam's Bindo plantation. This represents only a small forest block by Gabonese standards, but is of some importance for maintaining biodiversity and quality habitat adjacent to the Ogooué River: a) it is one of the more intact blocks of forest along the degraded axis of the Libreville-Lambaréné road, b) it supports three of the flagship mammal species of the Bas Ogooué Ramsar site that meet Ramsar criterion 4, and c) it connects to wetland

¹⁰ Motsaba, A., Tezi, J-P, Aba'a, R & F. Maisels. 2009. Recensement des grands mammifères et des impacts humains au Parc National d'Ivindo, Gabon, WCS Gabon

and swamp forest ecosystems near Ogooué River that are broadly representative of the Bas Ogooué Ramsar site's ecosystem mosaic.

Therefore, this forest block with its population of chimpanzee, gorillas and elephants is considered as HCV1 due to its role in maintaining important forest biodiversity adjacent to the Ogooué River and supportive role in protecting representative forest species and habitat types of the Bas Ogooué Ramsar site.

Faunal: aquatic biodiversity

The aquatic biodiversity of the site was a particular focus for this study, given the location of the BB concession within the Bas Ogooué Ramsar site. The Ramsar site supports unique and significant fish populations and breeding grounds in the wetland complexes downstream of the concession, making it crucial to do adequate sampling of the freshwater fauna in the BB concession and to understand potential downstream impacts.

Despite the concession's location, the fish and aquatic macroinvertebrate surveys revealed low species richness and diversity of these taxonomic groups in the concession, with the species composition comprised of widespread species indicative of relatively degraded habitats. 22 fish species from 12 families were sampled in the concession. Several important factors appearing to contribute to the depauperate aquatic community are:

- a. the stark seasonality of the Béné river and its tributaries in the BB concession, all of which are virtually dry during the dry season with the exception of some small standing pools towards the south of the concession,
- b. the presence of several waterfalls on the Béné river that are likely to restrict the upstream movement of fish from the Ogooué river during the wet season,
- c. the presence of oil palm plantations planted by SIAT in the south-eastern corner of the concession, without adequate riparian buffers, and
- d. the degraded nature of the forest and vegetation in the western part of the concession.

Differences were observed in the aquatic communities across the concession, with fish diversity generally higher in the south of the concession, despite the more degraded vegetation in this zone, as a result of fish seasonally dispersing up into the Béné and other rivers in the concession from the Ogooué river during the wet season. For the macroinvertebrates there was one similarity in that diversity was higher in the south, however, species composition in the south was dominated by pollution tolerant species compared to more pollution sensitive species in the north of the zone. These biotic analyses do not indicate precise types of pollution, and so could be caused by a range of factors ranging from higher temperatures in these more open habitats in the south to increased turbidity resulting from the lack of buffer zones in areas previously planted by SIAT.

Although broadly an impoverished community, two cichlid species (*Chromidotilapia regani* and *C. kingslayae*) endemic to the Ogooué river basin were recorded in rivers within the MDF in the northeast of the concession (stations 1-3). *C. regani* is also listed as Vulnerable on the IUCN red list. However, given that these species occur throughout the Ogooué basin and their relatively low density in the site, they do not warrant classification as HCV1.

During stakeholder consultation TNC commented that the fish sampling had only been done during one season (the wet season), and stated that the inventory cannot be considered complete unless some sampling was done during the dry season. It was suggested that different species assemblages may persist in or use wet refuges or pools during the dry season. TNC noted that the precautionary buffer zones

proposed should ensure any aquatic species are protected during development, but requested that Olam conduct additional fish sampling during the dry season in the near future.

The aquatic fauna in the concession does not appear to represent any of the significant concentrations of freshwater species found downstream in the Ramsar site, and so it cannot be considered HCV1. Nonetheless, it will receive protection from precautionarily large HCV4 riparian buffers recommended in this study to minimise downstream impacts on the Ramsar site, and the two *Chromidotilapia* species will also benefit from additional protection of the proposed HCV1 management area in the northeast of the concession.

ANPN shared the results of an analysis for the concession using their HCV risk and oil palm suitability screening tool. Overall the analysis showed little overlap between the concession and nationally important HCV areas, with the only concern being the potential presence of the Nile crocodile (*Crocodylus niloticus*) in the area, and their possible breeding sites of riverine sand banks. Based on this recommendation the team consulted Dr Matt Shirley (regional crocodile expert). He said it is unlikely that they occur in the concession as Nile crocodile numbers on the Ogooué river near Lambarene were devastated by the crocodile leather trade in the 1960s-1970s, although there is a slim chance that they persist in some wet refuges (lakes or small rivers) away from the Ogooué where hunting pressure is lower. It was suggested to interview fishermen in the zone to find out if they had encountered either Nile crocodiles or the other two species occurring in Gabon. Village members interviewed during socio-economic surveys and informal discussions with villagers had not encountered Nile crocodiles, mentioning only dwarf crocodiles (*Osteolaemus tetraspis*). This strongly suggests that Nile crocodiles are not found in the concession. There are no lakes, swamp forest or sand banks in the concession, and so any Nile crocodiles in the concession would have to be inhabiting rivers, that will regardless be protected with riparian buffer zones.

Flora

During the botanical inventory carried out by IRET, 1466 trees were sampled, representing 128 species in 38 different families (see species list in Annex 7). The forests in the BB concession are mainly made up of species belonging to Urticaceae, Burseraceae and Euphorbiaceae families. The most typical tree genera are *Musanga* (Urticaceae): by far the most dominant, *Aucoumea* (Burseraceae), et *Diospyros* (Irvingiaceae). The three most abundant species recorded during floral surveys were *Musanga cecropioides* ('Parasolier'), *Aucoumea klaineana* ('Okoume') and *Macaranga barteri*¹¹, typical of fallow regrowth. The absence of species belonging to the Caesalpiniaceae family, which is a group of trees widely found in intact Gabonese forests in the top 10 of the most representative species, is a strong indicator of the degraded nature of the forest in BB concession.

¹¹ (TEREA, Evaluation de l'état initial de la biodiversité pour la concession d'Olam Bifoun 2017)df



Figure 5: MDF forest in the northeast of the BB concession

The MDF forest in the northeast of the concession is mostly slightly older secondary forest with some small pockets between streams/rivers (where presumably little-to-no logging has occurred) with a structure approaching that of climax vegetation. For the most part, this north-eastern part of the concession dominated by areas of large but scattered 'Alep' (*Desbordesia glaucescens*) trees interspersed with lower vegetation. This structure indicates previous village plantations, where large Alep trees were left standing as they provided a NTFP resource and are hard and high-buttressed trees that were difficult to fell (Lee White pers. comm.).



Figure 6: Large alep tree surrounded by lower vegetation

Initial thinking that there may have been pockets of swamp forest in the concession was proven false by the botanical survey and HCV teams field recces which found no evidence of swamp forest, only some small areas of riparian forest along rivers and streams in the concession. It is evident that swamp forest is restricted to the zone east of the concession closer to the Ogooué River.

16 RTE, endemic or nationally protected species were recorded in the concession, including nine IUCN vulnerable species, one endangered species (*Diospyros crassiflora*) and three endemic species (*Cleistanthus gabonensis*, *Diospyros rabiensis* and *Eurypetalum batesii*). This is an endemism rate in the BB concession of 2.3%, significantly lower than the average for the Bas Ogooué landscape (7.5%) and national average (13%). The botanical team also noted that this recorded assemblage of RTE, endemic and protected species represents a low diversity and density by Gabonese standards.

Overall, the floristic assemblages and RTE species recorded in the concession cannot be considered to qualify as nationally, regionally or globally significant concentrations of biodiversity and therefore cannot be considered HCV1. Nonetheless it is worth noting that the RTE species recorded were virtually all found in the HCV1 MA in the east of the concession and so will receive indirect protection

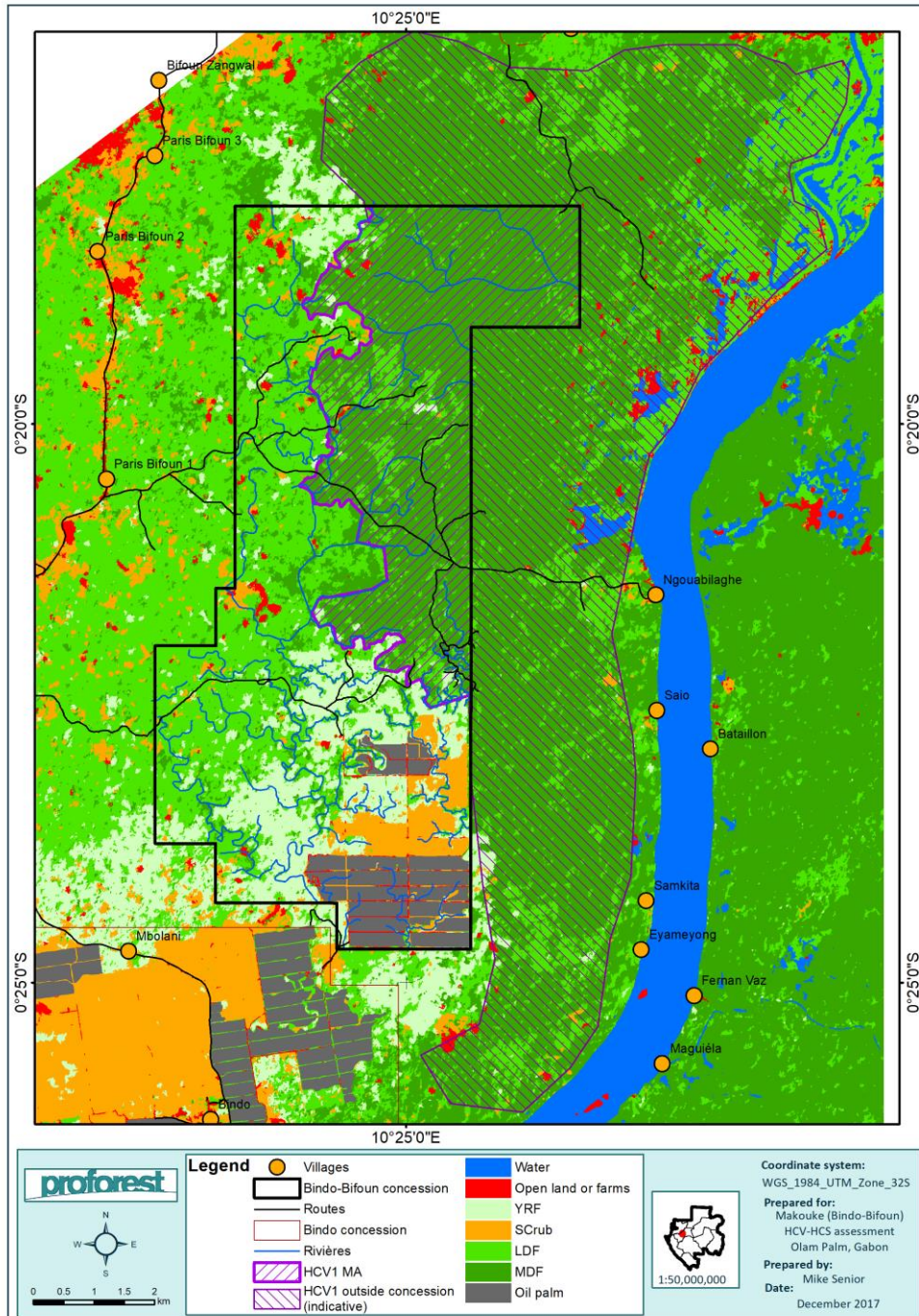


Figure 7: HCV1 management area (final) for co-occurring IUCN red listed mammals in significant forest block for the landscape due to its buffering role for the river and representative mammals of the Ramsar Site. Indicative HCV1 area outside the concession is also shown

3.2.3 HCV 2 Landscape-level ecosystems and mosaics

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

The concession is not located in either an Intact Forest Landscape or a CARPE landscape which would be the typical indicators for HCV 2 in the Gabonese and central African context. Also, due to the intersection of the national highway and Ogooué river, and a high human density for Gabon standards, this region (Lambaréné region) represents a fragmentation zone of Gabon's vast forest blocks. The concession itself is further disconnected from any major forest block, as it is nestled in between national roads to the north and west and lower stretches of the impassable Ogooué River. The faunal and floral studies demonstrate that the concession does not contain populations of the great majority of naturally occurring species. For these reasons we conclude that HCV 2 is not present within or near the BB concession.

This Ramsar site is recognised for its large, complex mosaic of interconnected aquatic and terrestrial ecosystems (mangroves, lakes, wetlands, riparian and terra firma forests), but this mosaic is more typical of the lower stretches of the Ogooué river and is absent from the concession.

3.2.4 HCV 3 - Ecosystems and habitats

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

The major vegetation types of the Bas Ogooué Ramsar site have recently been characterised (Viennois, *et al.* 2017). The BB concession falls within an area of dense and secondary forest and plantations, with none of the rarer vegetation types e.g. flooded forest, swamp forests, marshes etc. occurring within the concession. During the field surveys, there was no evidence of smaller patches of closed swamp forest within the concession. None of the remaining rare or endangered ecosystems in the Gabon National Interpretation occur in the concession.

The forests in the concession are closely aligned with the coastal forest form of Central Africa, which, when intact, can be considered threatened due to heavy historic logging (Figure 8). However, even the less degraded eastern forests of the concession would not qualify as HCV 3 for this forest type, due to the high level of degradation shown by the low species diversity and endemism level compared with Gabon's intact forests. *We conclude that HCV 3 is absent from the concession, but potentially present in swamp forest to the east of the concession adjacent to the Ogooué river.*

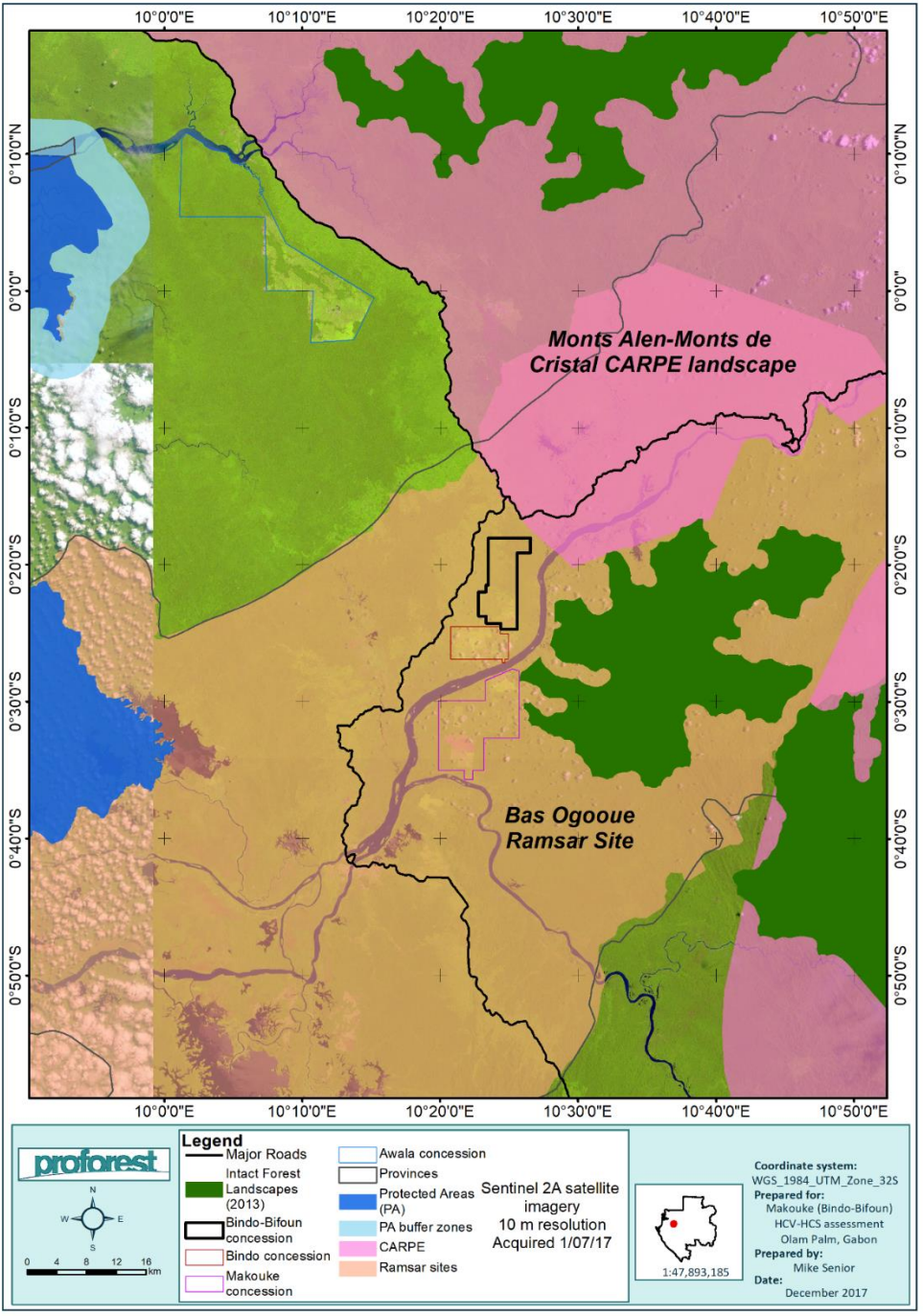


Figure 8: Intact Forest Landscapes and other conservation landscapes in the Makouke landscape

3.2.5 HCV 4 Ecosystem services

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

The topography of the BB concession is mostly very flat, with only a few gentle hills no higher than 90 metres in the concession.

The villages in the Aol either grow or collect forest plant products that rely on wild pollinators, e.g. plantains, tomatoes, chilis, andok, etc. Whilst research on the importance of wild pollinators is lacking, all of the cultivated crops are known to be pollinated by a range of pollinators and these crops are widely cultivated across West and Central Africa, including in areas with significantly less forest cover, and there is no reason to believe that conversion of some natural scrub or even degraded forest would negatively impact pollination of these species. For forest species used by communities and HCV 1 tree species, evidence on pollinators is even scarcer, however, these species and any pollinators are expected to be well protected in HCV 1 management areas, HCS forest, HCV 5 community use areas and forest in the wider landscape.

In the humid forest belt of Gabon, where the Aol is located, fire may be used occasionally on a small scale for shifting agricultural land clearance but typically land is cleared without fire. Virtually all of the Aol is covered with moist forest cover (in varying degrees of degradation), therefore, given the high humidity in the landscape and rarity of the use of fire, forests are not considered to provide critical functions of fire prevention and protection in the Aol. Wind protection is not a concern in the Aol nor in the landscape, which is all in the lowlands and far from the coast with significant natural shelter from wind.

The main HCV4 consideration for the concession relates to impacts on water quality and quantity. There are two main reasons why all rivers and streams in the concession are considered HCV4: 1) all rivers drain directly into the ecologically sensitive, downstream Ramsar site, and 2) the concession is upstream of numerous settlements that rely for part of the year on river water for drinking, fishing and other livelihood activities.

Villages along the Ogooué are more reliant on fishing as a livelihood and are less affected by seasonality, whereas the villages away from the Ogooué, and especially along the main road, only fish and collect river water seasonally – relying on pumps for ground water during the dry season.

Due to the sensitive location of the concession, within a Ramsar site, we propose doubling the width of the buffer zones compared to the Gabon RSPO NI to 100m (on each bank) for the Bene and 40m (on each bank) for all other tributaries (Figure 9)

Permeability of the soils in the south of the concession means there is a moderately high vulnerability of the watershed to pollution due to risk of agrochemicals polluting groundwater if improperly managed. Olam should apply a minimised fertilisation regime to avoid any pollution of the water table.

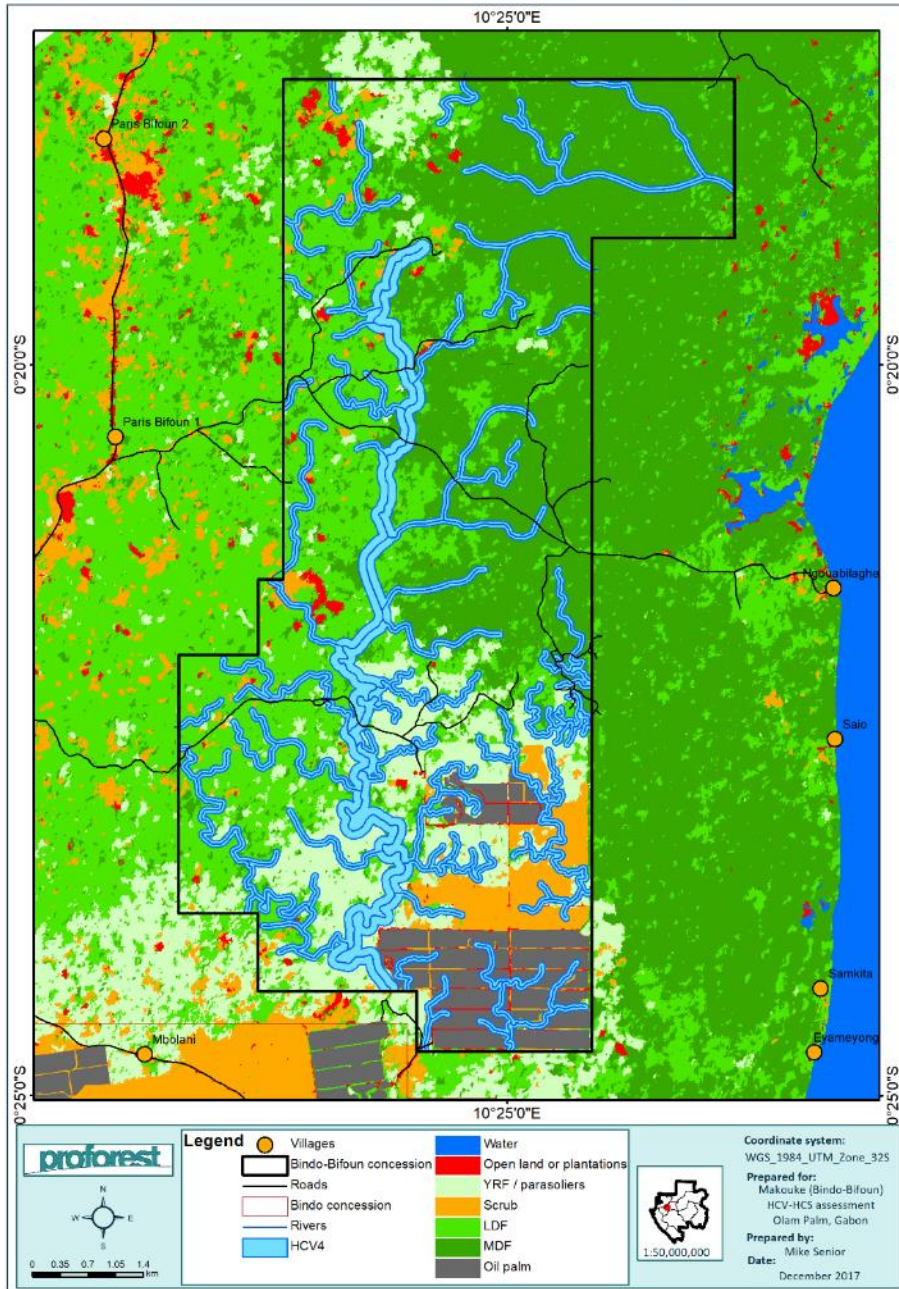


Figure 9: HCV4 management areas (provisional). Note that HCV4 areas also include riparian buffers and rivers downstream of the BB concession but are not shown here to ensure the map is legible

3.2.6 HCV 5 – Community needs

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

Participatory mapping studies revealed that six of the 27 villages in the Aol conduct livelihoods activities (fishing, farming, hunting, fuelwood collection, NTFP collection, timber extraction or gathering) inside the BB concession. These villages are Paris Bifoun 1, Paris Bifoun 2, Bifoun 3, Benguie 4a & b, Bindo and Amanegone.

Villages in the area are using rivers in the concession to meet some of their basic needs for fishing at certain times of year. HCV4 management areas are expected to provide adequate protection of these water resources, but these riparian buffer zones should also be considered as HCV5 management areas to ensure continued community access and maintenance of safe water resources for fishing.

The majority of village members still make their livelihoods or subsistence needs through farming or use of natural resources. Food crops are grown for subsistence needs and also sold along the road or at the nearby Makouke market. Although produce is sold, farming cannot be considered a commercial activity as income received is used primarily to meet basic needs.

Currently, the majority of village plantations are located outside the concession in the belt near the road. However, reliance of the communities in the zone on agriculture for their livelihoods, and a relative scarcity of viable farmland means that farming should be considered HCV5 and Olam must ensure that communities continue to have adequate access to land for farming (either inside or outside of the concession) to meet basic needs during and after negotiations.

Villagers hunt, collect nuts, fuelwood, medicinal plants, fruits and leaves, harvest timber and to a lesser extent fish inside the BB concession. Bushmeat is the primary source of protein for villages in the zone, with fish of more importance along the Ogooue. Villages reported eating all bushmeat species based on availability with red river hog (Sanglier), porcupine (Porc-épic) and cane rat (Hérisson) the most commonly caught. Only a small number of villages keep small numbers of livestock primarily for cultural purposes, and fodder was not mentioned as critical basic resource. Of particular importance amongst NTFPs collected are Marantaceae leaves (Figure 18), which was observed to be widespread and the forest understorey in much of the concession was dominated by Marantaceae.



Figure 10: Collection of Marantaceae leaves in the BB concession by a lady from Paris Bifoun 1

Use zones for the six villages that overlap the BB concession are considered HCV5 areas and are shown in Figure 11. There has been a comprehensive validation of these maps in the villages, firstly of the use points during the participatory mapping and secondly of the use zone boundaries during final village consultation on the HCV results. Note that these maps of HCV5 areas are subject to negotiation between Olam and each village after this HCV report has been finalised.

Two final points to note are that: 1) Benguie 4a and 4b rejected the project during the validation meeting and so their land will be excluded from the development area, and 2) For Bindo village it was noted that satellite imagery showed farms outside the concession but in the village's use area that appeared not to have been picked up during the participatory mapping. Although the maps were validated by the villages it is suggested that Olam verify the maps with satellite imagery prior to negotiations

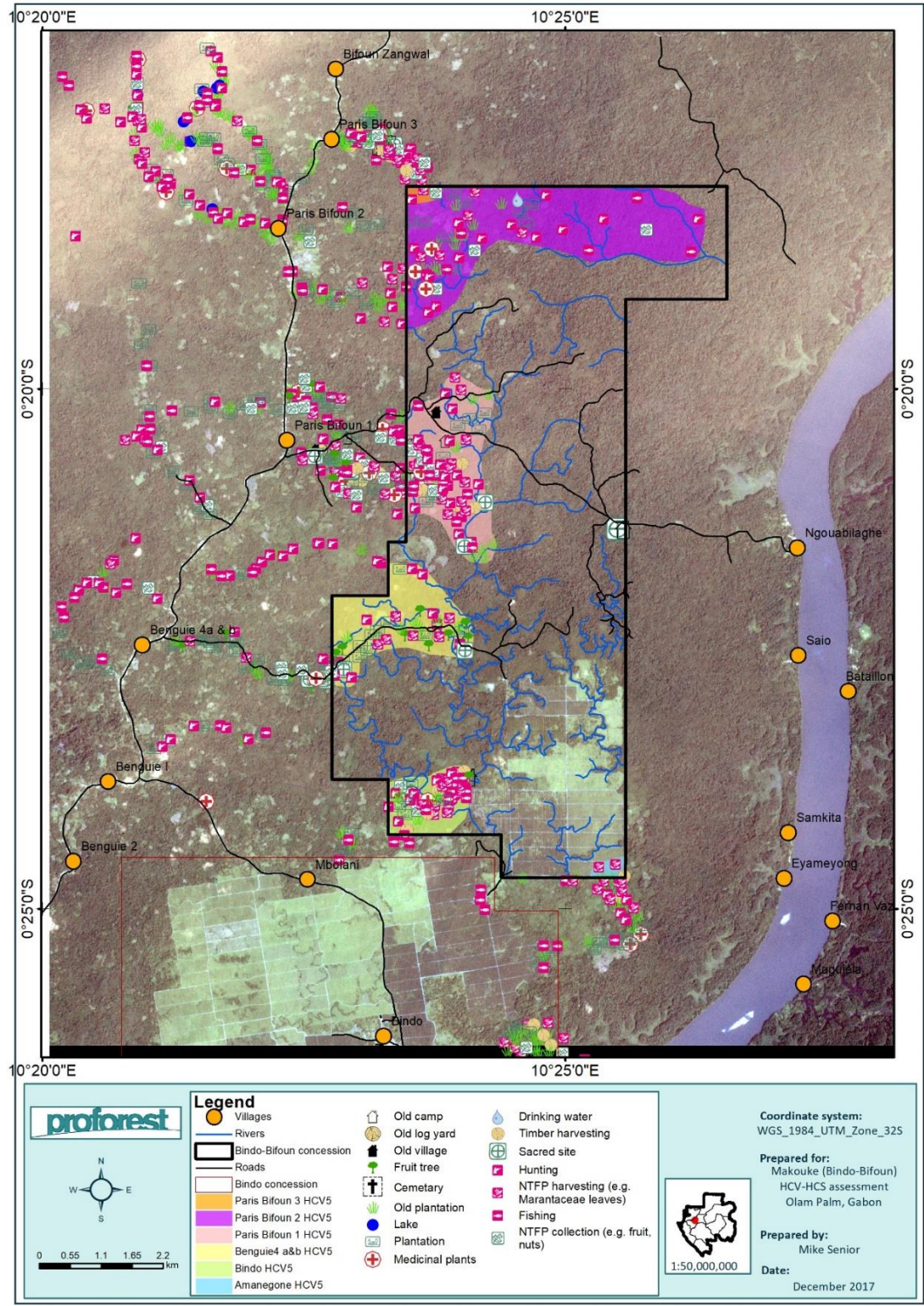


Figure 11: HCV5 areas (final) subject to negotiation between villages and Olam. Note that HCV5 areas outside of the BB concession are indicated by points and polygon boundaries are only shown inside the concession

3.2.7 HCV 6 – Cultural values

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

Four villages around the concession were found to have physical sacred or culturally important sites in the concession: Paris Bifoun 1, Benguie 4a & b, Bindo and Ngouabilaghe¹². These sites are old villages and other sacred sites, such as initiation sites or sacred groves, and are all considered HCV 6. It should be noted that initiation sites (in comparison to other sacred sites such as burial sites) often change location over time through ritual processes so may be subject to negotiation with communities. The sacred sites are either for religious or cultural rituals or initiation rites (not cemeteries which were mapped separately). The precise significance of the sites depends on the villages and is somewhat guarded within the villages, and access to the sites is forbidden to members of the public and permitted only to initiated village members. The only details shared about the sacred sites is as follows:

- Paris Bifoun 1, which consisted mainly of sites nearby to the petit Béné and grand Béné rivers and adjacent to old camps,
- Benguie 4a & b, which were also on the banks of the grand Béné river,
- Bindo: the sacred site inside the BB concession is associated with a former camp, and
- Ngouabilaghe: sacred site Ndoume which is also adjacent to a former camp.

The location of these sites was validated during the initial participatory mapping and again during the final HCV village consultations. As a precautionary measure Proforest have proposed 50 m buffer zones, as minimum HCV management areas, for each HCV6 site. However, we recommend that Olam verifies and validates a final set of HCV6 sites with each village prior to any clearance and after negotiations are completed. This will ensure HCV5 and 6 management areas are integrated and avoid enclaving HCV6 sites within future plantations.

¹² Note that Ngouabilaghe has cultural sites but did not have HCV5 activities inside the concession

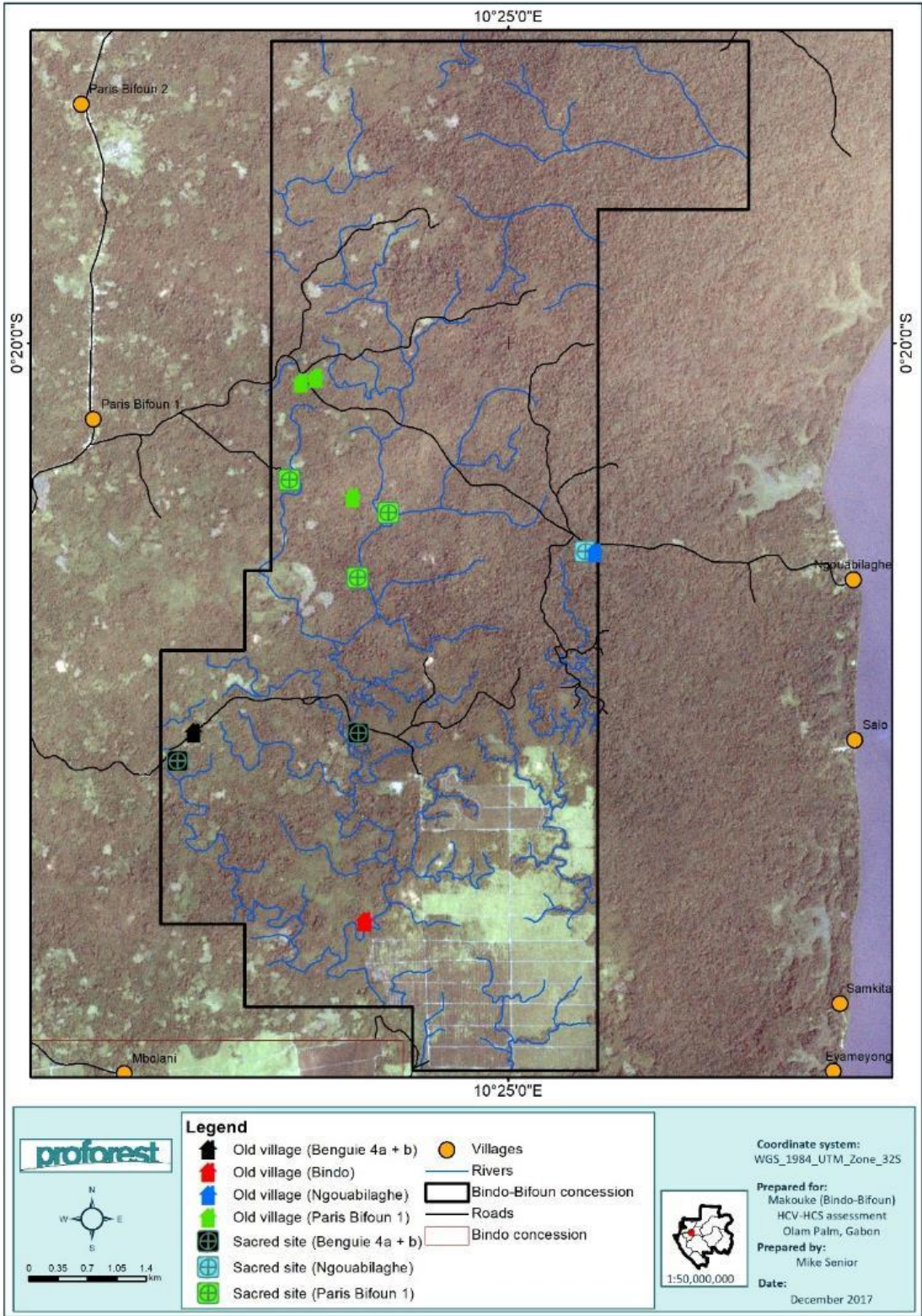


Figure 12: HCV 6 points (final)

3.3 Soil and Topography

According to national soil maps, two soil types are found in the concession, UC 15 and UC 18. UC 15 is found in the western half of the concession. This is a type of young ferrallitic soil, found in more-or-less undulating regions and has a weak drainage. It is a clayey material with a significant proportion of fine sand and silt. This is the most suitable soil type for agriculture. UC 18 is found in the eastern half of the concession, and is a clayey-sand (agilo-sableux) soil type dominated by fine sand, mostly found around the Ogooué River. The topology is typically undulating with wetlands in the lower lying areas especially bordering the Ogooué. It is less suitable for agriculture than UC 15.

The soil has been classified as undulating (4-12%) and rolling (12-24%).

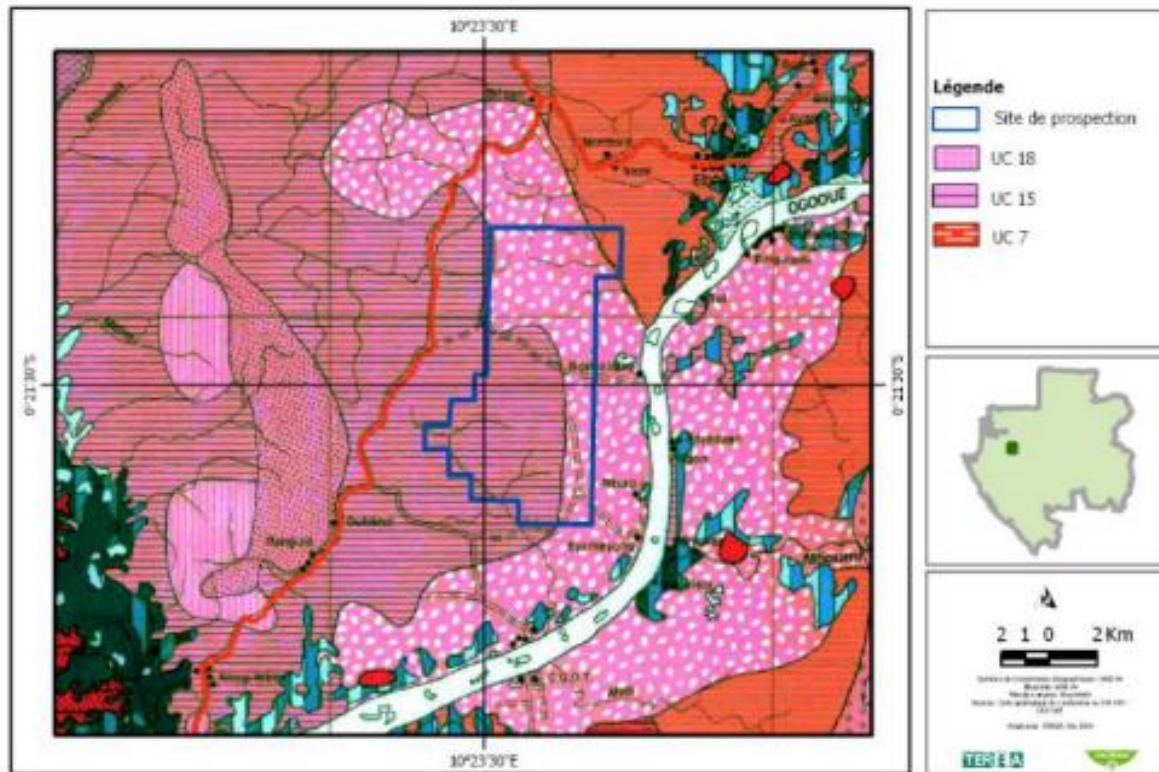


Figure 13: Map of soil types in the BB concession

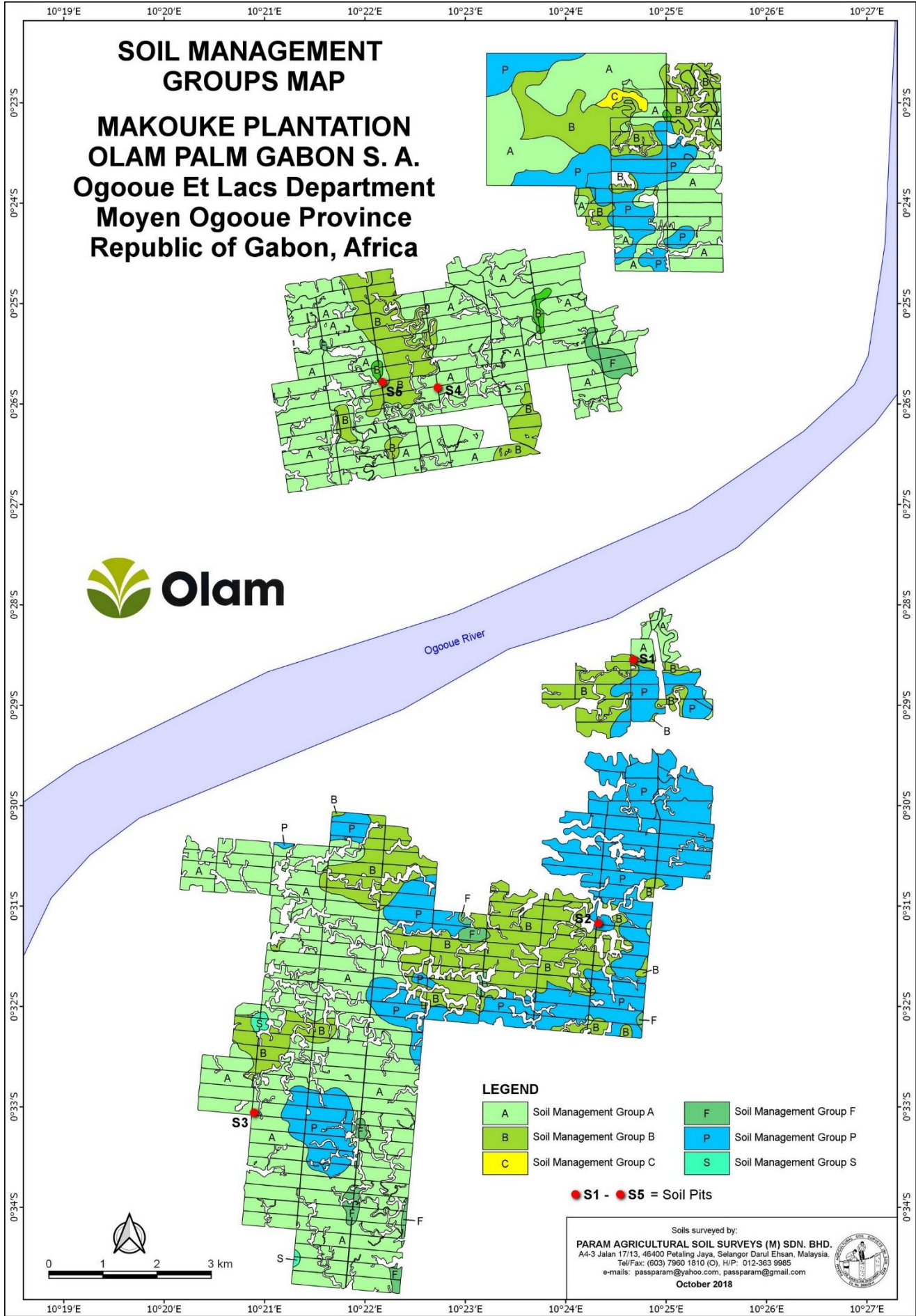
The soils have been extensively surveyed and characterized as part of the ESIA following a two-prong approach:

1. Desk based study of existing information on the soils of Gabon and
2. Soil sampling and analysis of the main soil types found within the concession area.

A semi-detailed soil survey was carried out Param Agriculture Soil Surveys (M) Sdn. Bhd in October 2018. At each examination point the soil was examined using a Jerret soil auger and the soil examined to a depth of 105 cm or to an impenetrable layer. At each observation point, the depth, the colour, mottling, texture,

consistence, presence of rock fragments and roots were described using the terminology of the FAO's Guidelines for Soil Description (FAO, 1977) and the Malaysian Standards Terminology for Soil Description.

The following map shows the Soil Management Group Map as surveyed by Param in Oct 2018. The soil management groups are classified as A, B, P and the corresponding management practices needed are detailed in the table below. There is **no peat soil** and all the soil groups are found suitable for oil palm plantation. Permeability of the soils in the south of the concession means there is a moderately high vulnerability of the watershed to pollution due to risk of agrochemicals polluting groundwater if improperly managed. This will be managed as part of HCV 4 as stated above.



SOIL MANAGEMENT GROUPS MAP

**MAKOUKE PLANTATION
OLAM PALM GABON S. A.
Ogooue Et Lacs Department
Moyen Ogooue Province
Republic of Gabon, Africa**

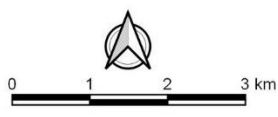


Ogooue River

LEGEND

 A	Soil Management Group A	 F	Soil Management Group F
 B	Soil Management Group B	 P	Soil Management Group P
 C	Soil Management Group C	 S	Soil Management Group S

● S1 - ● S5 = Soil Pits



Soils surveyed by:
PARAM AGRICULTURAL SOIL SURVEYS (M) SDN. BHD.
A4-3 Jalan 17/13, 46400 Petaling Jaya, Selangor Darul Ehsan, Malaysia.
Tel/Fax: (603) 7960 1810 (C), H/P: 012-363 9885
e-mails: passparam@yahoo.com, passparam@gmail.com
October 2018



Table 7: Soil Management Groups Legend

Soil Management Group	Soil Map Units	Main Characteristic/ Limitation	Management Practices Needed	Extent	
				Ha	%
A	Kbg/2 Kbg/3 Trp/2 Trp/3 Tbk/2 Kcr/2	Deep (>100 cm) to moderately deep (50-100 cm) fine sandy clay to clay (>35% clay) textured soils. Low fertility.	Soil erosion monitoring and mitigation: <ul style="list-style-type: none"> cover crop establishment. terracing. frond stacking. Good fertilizer programme.	1,682.5	43.3
B	Nmi/3 Nag/2 Rsu/2	Deep (>100 cm) to moderately deep (50-100 cm) well drained soils. Texture sandy clay loam (18-35% clay). Moisture stress and yield fluctuations. Low fertility.	Soil erosion monitoring and mitigation: <ul style="list-style-type: none"> cover crop establishment. terracing. frond stacking. EFB application. Good fertilizer programme. Monitor K levels.	460.8	19.2
F	Kuh/2 Kuh/3	Shallow (<50 cm) soils with sandy clay to sandy clay loam texture. Moderately well drained. Moisture stress and yield fluctuation. Wind damage. Soils often on steep slopes.	<ul style="list-style-type: none"> EFB application. Frond stacking. Erosion monitoring and mitigation. Soil moisture conservation. Cover crop establishment. Fertilizers in holes 	21.3	0.9
P	Jta/2	Shallow (<50 cm) well drained soils. Gravelly sandy clay textures. Shallow soil depth. Dense lateritic/gravel layer (<50 cm). Low fertility. Poor rooting. Moisture stress. Wind damage.	Soil erosion monitoring and mitigation: <ul style="list-style-type: none"> cover crop/wind breaks establishment. terracing. frond stacking. EFB application. Moisture conservation. Good fertilizer programme.	235.9	9.8
				2400.5	100

3.4 Summary of carbon stock assessment and GHG Emissions

Olam is abiding by a moratorium on land clearance until January 2019 and will furthermore continue its protection of HCV and HCS forests according to the HCV Network guidance and HCS Approach, or an agreed 'adapted' Gabon-relevant HCS approach endorsed by national stakeholders and RSPO (as per the Olam Living Landscape Policy commitments, 2018). **Therefore, this assessment was conducted as an integrated HCV-HCSA assessment to identify both HCV and HCS areas. This report follows the HCV-only reporting template, because the assessment was completed before the HCVRN and HCSA had developed HCV-HCSA report quality review procedures.**

The ESIA and HCV-HCSA assessments were conducted simultaneously. This HCV assessment used the HCVRN's Common Guidance on HCV Identification as a primary reference, with the Gabon draft HCVNI as a supporting guide to identify HCVs. The Gabon NI was used only as a supporting document as it is now quite outdated and was developed for forestry operations.

Given the numerous times that the BB concession has changed hands over the past decades (AgroGabon, PalmHevea, SIAT, Olam), there is high degree of frustration amongst the villages regarding changing social agreements and development plans. For this reason, and the fact that the 'final' developable area may change based on discussions about an 'adapted' Gabon-relevant HCS approach, it was decided that:

1. The HCV assessment team would only present the results of the HCV assessment to villages for the final consultation meetings, and
2. Olam's social team will communicate to each of the villages, as part of ongoing FPIC discussions and during the pre-development negotiation of social contracts, that Olam will initially only be developing a subset of non-HCSA and non-HCV areas but that other areas *may* be developed in the future pending agreement of an 'adapted' Gabon-relevant HCS approach endorsed by national stakeholders and RSPO. Olam should regularly update villages on the status of discussions.

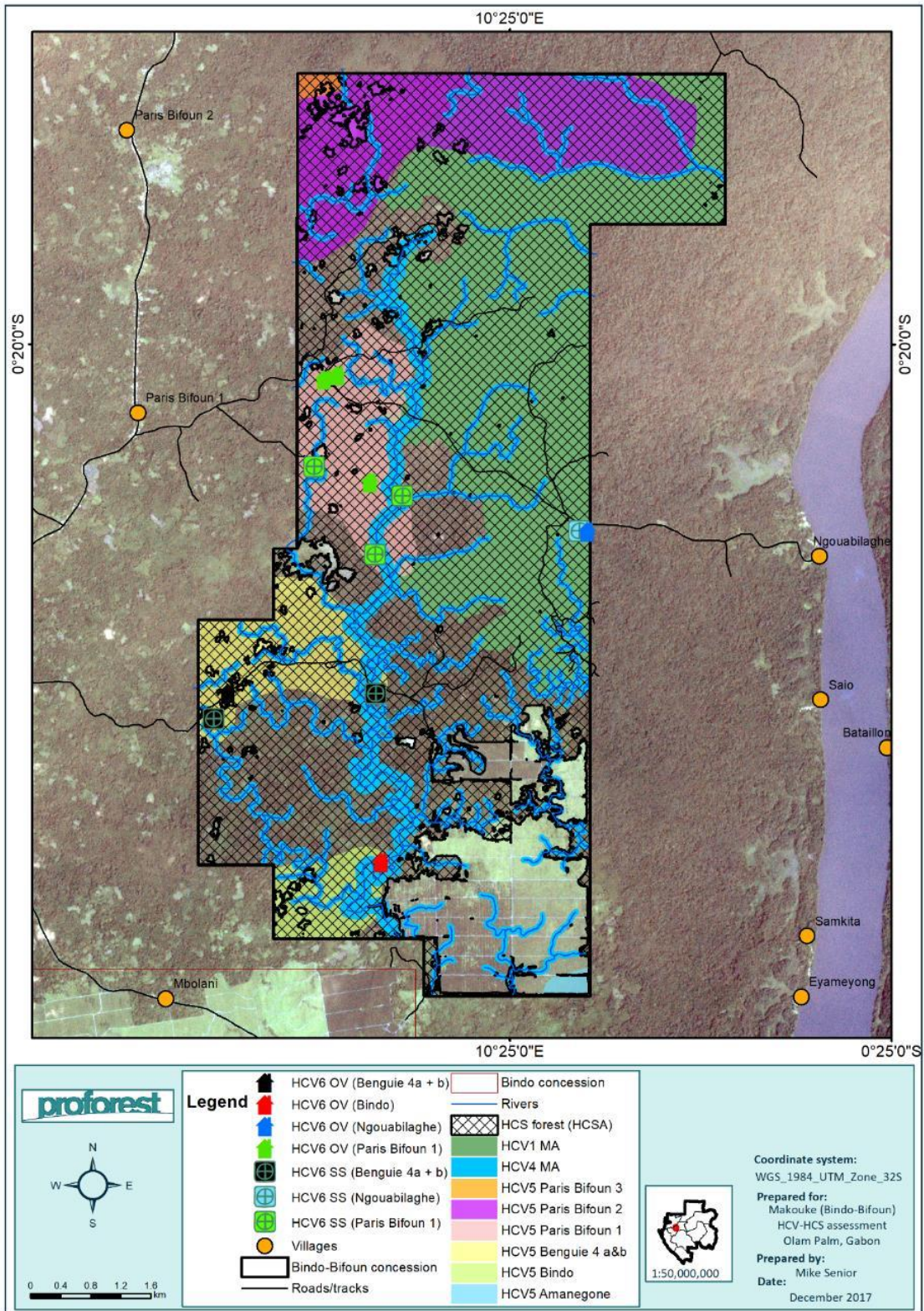


Figure 14: Map of final HCV1 MA, provisional HCV4 MAs, HCV5, HCV6 areas, and HCS forest. OV=Old village, SS=sacred site. Source: The HCV areas and HCV Management areas were defined by the assessment team during the expert workshop.

3.5 GHG Emissions Assessment for New Plantings

Based on carbon stock and HCV maps, 2 scenarios are developed to estimate ~~potential~~ emission of the proposed NPP area.

Description of new development scenarios

Scenario 1	All potential areas for new plantings is developed for oil palm, no clearing of HCV and HCS (all HCS has been incorporated as HCV 4). No methane captures facility and 100% conventional POME treatment using anaerobic pond
Scenario 2	All potential areas for new plantings is developed for oil palm, no clearing of HCV and HCS (all HCS has been incorporated as HCV 4). With methane capture facility.

		S1	S2
Non plantable area	HCV area	4743.1	4743.1
Plantable area	Non-HCS area (potentially developable, pending HCV and community land) using HCSA definition	533.235	533.235
Infrastructure		28.065	28.065
POME treatment	Conventional	100%	
	Methane capture		100%

3.5.1 Projection of GHG Emission for Scenario 1

3.5.2

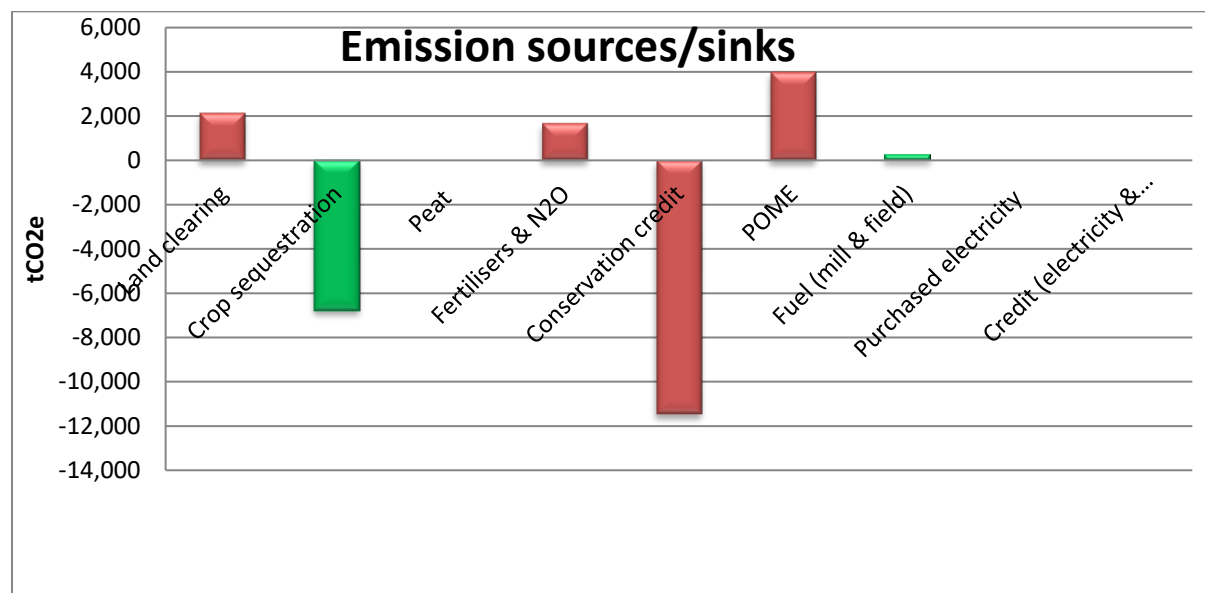
Field emissions & sinks

	t CO ₂ e	t CO ₂ e/ha	t CO ₂ e/t FFB
Land clearing	2,129.10	2.93	0.14
Crop sequestration	-6,791.94	-9.36	-0.45
Fertilisers	925.78	1.28	0.06
N ₂ O	709.86	0.98	0.05
Field fuel	135.81	0.19	0.01
Peat	0.00	0.00	0.00
Conservation credit	-11,430.87	-15.76	-0.75
Total	-14,322.26	-19.74	-0.94

Mill emissions & credit

	tCO ₂ e	t CO ₂ e/ha	tCO ₂ e/tFFB
POME	2,986.42	4.12	0.20
Mill fuel	54.66	0.08	0.00
Purchased electricity	0.00	0.00	0.00
Credit (excess electricity exported)	0.00	0.00	0.00
Credit (sale of biomass for power)	0.00	0.00	0.00

Total	3,041.08	4.19	0.20
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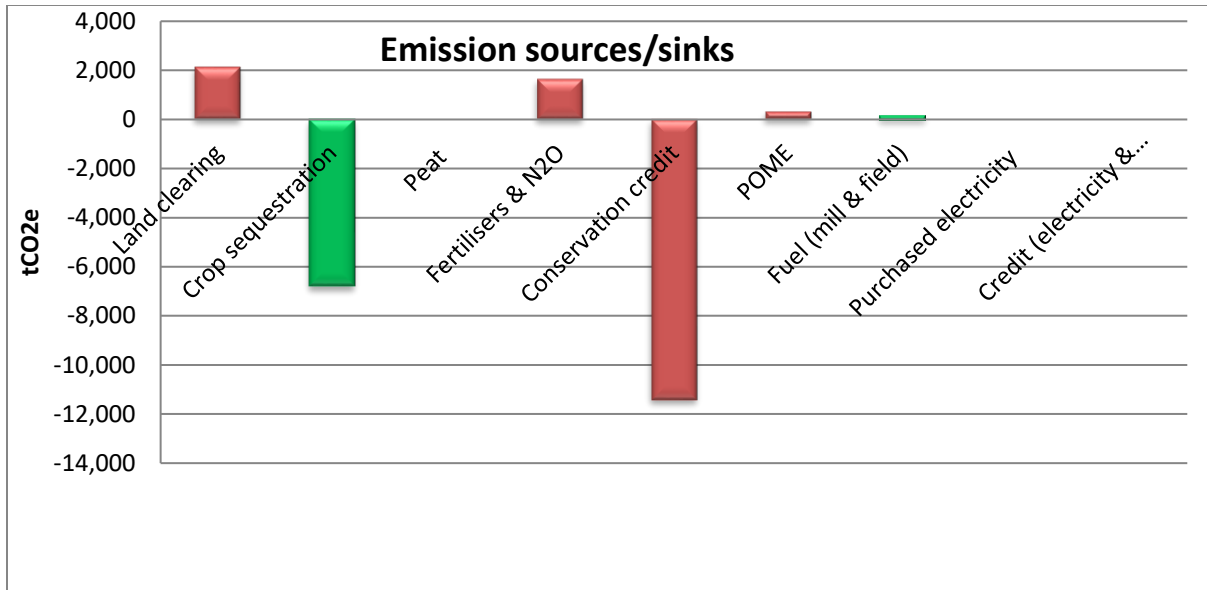


3.5.3 Projection of GHG Emission for Scenario 2

Field emissions & sinks (Assumes vigorous growth for oil palm - for use by large scale operations)

	t CO ₂ e	t CO ₂ e/ha	t CO ₂ e/t FFB
Land clearing	2,129.10	2.93	0.14
Crop sequestration	-6,791.94	-9.36	-0.45
Fertilisers	925.78	1.28	0.06
N ₂ O	709.86	0.98	0.05
Field fuel	135.81	0.19	0.01
Peat	0.00	0.00	0.00
Conservation credit	-11,430.87	-15.76	-0.75
Total	-14,322.26	-19.74	-0.94

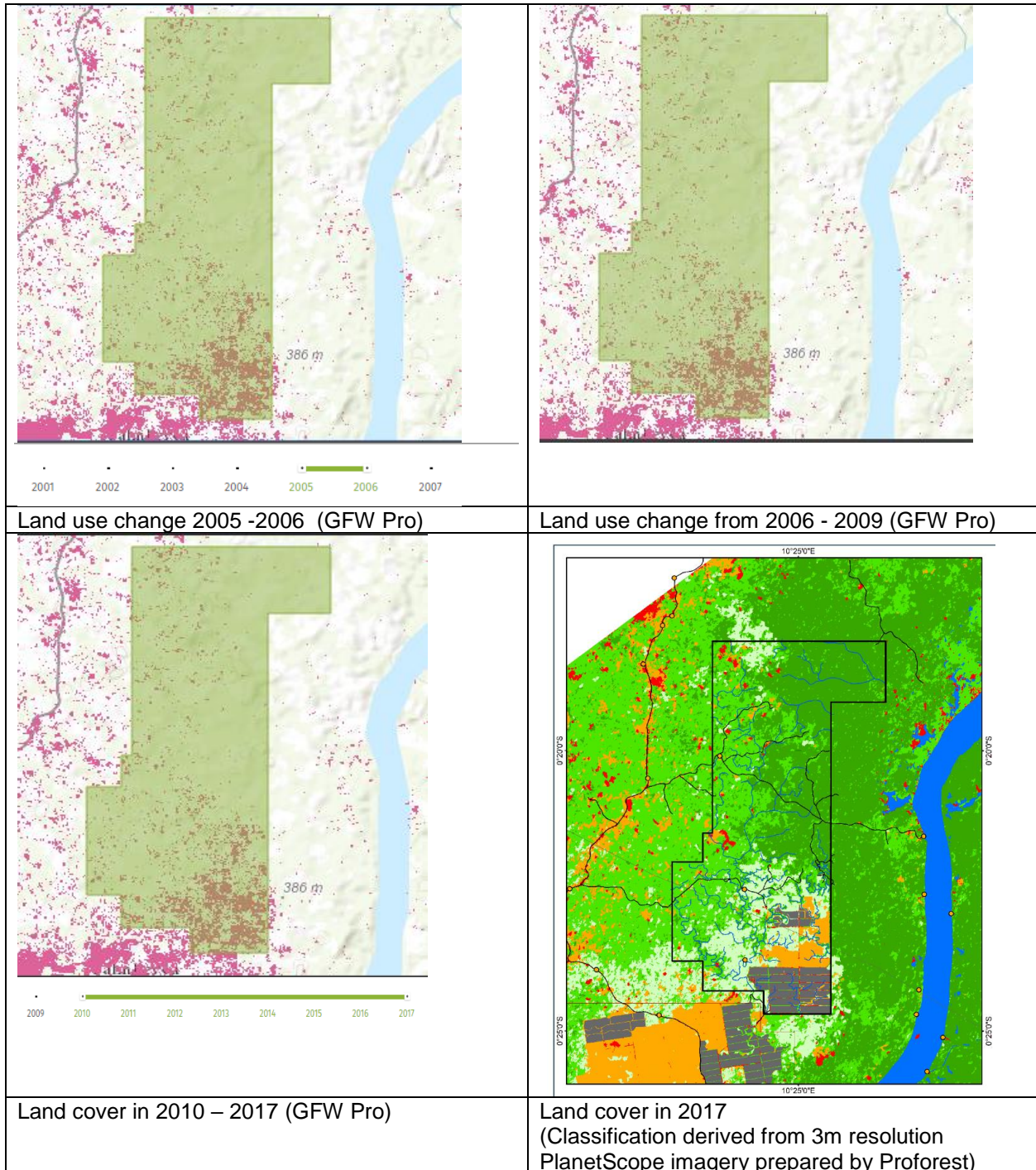
Mill emissions & credit	tCO ₂ e	t CO ₂ e/ha	tCO ₂ e/tFFB
POME	310.59	0.43	0.02
Mill fuel	54.66	0.08	0.00
Purchased electricity	0.00	0.00	0.00
Credit (excess electricity exported)	0.00	0.00	0.00
Credit (sale of biomass for power)	0.00	0.00	0.00
Total	365.25	0.50	0.02



Both scenarios will draw down CO₂ from atmosphere. However, Olam would not be conducted any new development in the area.

3.6 Land Use Change Analysis (LUCA)

Land use change analysis (LUCA) based on LANDSAT imagery was reviewed by Robert Horaliman Sinaga who has a background in GIS determine changes of vegetation since November 2005 using data from Global Forest Watch. The analysis shows no clearance of primary forest since 2005. HCV assessments have been conducted prior to new planting developments. The SEIA and HCV assessments are aligned with the LUCA performed on Landsat imageries (see HCV maps above).



<p>Legend</p> <ul style="list-style-type: none"> Bindo-Bifoun concession Towns & Villages Roads Departments Bindo concession Rivers 	<p>Land cover class</p> <ul style="list-style-type: none"> Water Open land YRF Scrub LDF MDF Palm
<p>Legend (Land cover in 2017 - (Classification derived from 3m resolution PlanetScope imagery prepared by Proforest)</p>	

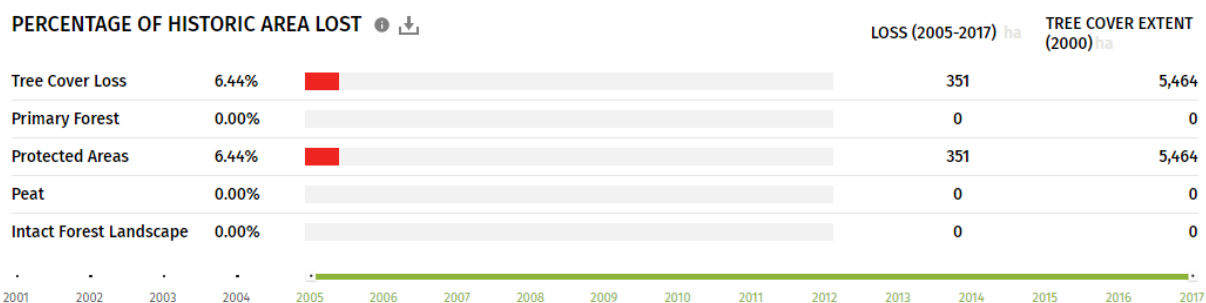


Figure 15: Analysis of tree cover loss based on data from Global Forest Watch

From the above analysis of tree cover loss (Figure 15) from Global Forest Watch, approximately 351 ha’s of tree cover loss was detected between 2005 and 2017 including 300.91 ha’s between 2010 – 2017. It is important to note that these areas lost was during the commercial planting done by SIAT after completing their HCV assessments. Other areas is mostly likely due used by communities for subsistence farming. This is confirmed by the 2017 land cover classification map (above) which is overlaid with villages as well as palm plantation by SIAT.

4. SUMMARY OF MANGEMENT PLANS

Summary of planning and management of BB, 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

Organizational information and personnel involved in planning and implementation are presented below:

Contact Persons	Position	Entity
Darshan Raiyani	Senior Vice President & Country Head	Olam Palm Gabon
Quentin Meunier	Head of Environment and Sustainable Development	Olam Palm Gabon
Henry Dusmin	Regional Manager	Olam Palm Gabon

Mohamed Dao	Regional Manager, CRS	Olam Palm Gabon
Nina Koubahangoue	Manager, CRS Plantations	Olam Palm Gabon

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, Social & GHG Management Plan

Operation Phase of the Palm Grove (Maintenance and harvesting)									
Receiving media	Impact and risk or danger factors	Impacts/Risks or dangers	Mitigation or prevention measures	Tasks	Monitoring indicators	Source of verification	Responsibilities		Frequency
							of execution	of control	
Water-soils and basements	Maintenance work Use of plant protection products and fertilizers	Eutrophication of Streams	Implementation of measures to limit eutrophication of watercourses	Maintenance of buffer zones at river limits to reduce runoff and fix nitrogen residues and phytosanitary products	Buffer zone Tags	Team Control Report HVC/CR&S Olam Palm Gabon	Agronomic team; Responsible for sustainable development (CRS managers) of Olam Palm Gabon; Plantation Manager of Olam Palm Gabon	DGEPN + associated Administrations	During the operation phase of the Palm Grove
			Schedule sensible inputs into fertilizers and phytosanitary products, adjusted and fractionated, over time	Awareness of operators about the use of recommended doses of products	Control report agronomist Engineers, Olam Palm Gabon Plantation Manager				
	Maintenance work Surface and groundwater Collection	Quantitative Impact (Resource decline)	Measuring water flows during the two seasons (dry and rainy) In case of Levy on the river Benny	Implementation of a timetable for monitoring water flows during the two seasons	Flow Measurement Report	Flow Measurement Report		DGEPN + associated Administrations	
	Water system malfunction	Real knowledge of floods flows	Calculate the low flow rates of the waterways to supply the palm grove and the facilities on the site	On-Site Flow meters					
Air-workers-vegetation	Maintenance work Use of phytosanitary products and fertilizers; Harvesting work Operation of machinery and vehicles (fumes from mufflers, dusts)	Air tainting; Emissions of flue gas and greenhouse gases	Moisten Dusty Areas	Water if necessary main roads especially in the dry season to limit the flight of dust during the transport of staff and of palm nuts for example (main roads for planting, bases lives, workshop, offices, etc.)	visual observation; No dust due to watering of the slopes	Team Control Report HVC/CR&S Olam Palm Gabon	Agronomic team; Agricultural engineers, Olam Palm Gabon Plantation Manager	DGEPN + associated Administrations	During the exploitation and harvesting phase of the palm Grove
			Keep vehicles, trucks and construction equipment in	Technical visit	Maintenance log; Number of technical visits				

			good working order						
			Educate and train workers to master the techniques of using inputs	Awareness and training sessions for workers	Training sheet Number of awareness meetings				
			Adopt regulatory measures on the effective conditions of use, the dosage limits, and the periods of application of fertilizers and phytosanitary products	Elaboration of the manual for the use of phytosanitary products	Control report Team agronomists, Manager Plantation of Olam Palm Gabon				
			If possible, innovate and progress in the techniques of application of nitrogen fertilizers (responsible for the release of N2O) and phytosanitary products, their adaptation and their appropriation by workers	-Training and sensitization of workers on new techniques for the application of chemical products; -	Training sheet Number of awareness meetings				

Operation Phase of the Palm Grove (Maintenance and harvesting)									
Receiving media	Impact and risk or danger factors	Impacts/Risks or dangers	Mitigation or prevention measures	Tasks	Monitoring indicators	Source of verification	Responsibilities		Frequency
							of execution	of control	
Biodiversity (Fauna and flora)	<u>Maintenance and operation of the Palm Grove</u>	Decrease in specific diversity	Respect declared areas HVC	Maintain the boundaries of declared areas HVC.	Well-demarcated buffer Zones; Presence of signs delimiting areas not to be crossed	Mapping sensitive areas	HVC team; Responsible for sustainable development (CRS managers) of Olam Palm Gabon;	Responsible for the DGEPN + associated administrations	During the operation phase of the Palm Grove
			Maintain a buffer zone on HVC spaces (animal movement corridor, feeding places, etc.)	Set up tags (signs delimiting buffer zones)	Presence of signs delimiting areas not to be crossed				

	Maintenance work Use of plant protection products and fertilizers	Impact on aquatic fauna	Respect of the buffer zone	Maintain a protection distance between the banks of the waterways and the borders of the Palm Grove	Well-demarcated buffer Zones; Presence of tags (Red markings)	Mapping sensitive areas	HVC teams; Responsible for sustainable development (CRS Managers) of Olam Palm Gabon	DGEPN + associated Administrations
			Present a list of non-or low-pollutant phytosanitary Products (updated documentary watch)	Availability of the list of approved phytosanitary products	Safety Data Sheets			
			Maintain buffer zones along streams and wetlands	Setting up tags showing buffer zone	Presence of signs delimiting areas not to be crossed			
	Increase in the number of employees in the area	Increased hunting pressure	Application of corporate policy prohibiting hunting in the concession for its workers and subcontractors	Prohibit the hunting of any worker or subcontractor on the site	Rules of Procedure Contracts with subcontractors; Number of anti-poaching clauses distributed and endorsed; Hunting Rate Number of sanctions	Control report Team Environment Olam Palm Gabon	HR Manager Responsible for sustainable development (CRS managers) of Olam Palm Gabon, HVC team	DGEPN + associated Administrations
			Organization for regular monitoring of workers on the site	Set up a surveillance and anti-poaching cell in the site and in the vicinity of the project	Existence of a control team and a strategy Number of men and days of control effort Number of signs banning hunting on the site	Text or note of creation of the monitoring cell		
			prohibiting the transport of game, weapons or hunters in vehicles of the company	Establishment of a contract containing the anti-poaching point	Number of anti-poaching clauses distributed and endorsed; Number of animals and equipment (shotgun, cartridges) seized	Team Control Report HVC/CR&S Olam Palm Gabon		

Operation Phase (Maintenance and harvesting)

Receiving media	Impact and risk or danger factors	Impacts/Risks or dangers	Mitigation or prevention measures	Tasks	Monitoring indicators	Source of verification	Responsibilities		Frequency
							of execution	of control	

Road Traffic	Harvesting work Traffic on the site Use of gears	Disruption of road traffic	Installation of signs related to the current activity at the site level and on the national road leading to planting	Perform a signalling in accordance with the work in progress (signs, flag holders), especially on the National road (Bifoun Lambaréné)	Presence of traffic signs	Team Control Report Hse Olam Palm Gabon	Agronomic team; Agricultural engineers, plantation Manager; Responsible HSE of Olam Palm Gabon.	DGEPN + associated Administrations	For the duration of the project.
		Accidents	To entrust the driving of gear to qualified persons	Driver Training and supervision	For all gear operators Recorded accident numbers	Impact Register Book			
			Equip vehicles with limited visibility to the rear of audible recoil warning devices	Installation of back-up audible alarms in trucks	Number of trucks with audible warning	Control report Team Environment Olam Palm Gabon			
			Inform communities of strong road traffic	Information meeting	Meeting Report and attendance list	Meeting Minutes			
Compliance with the rules of conduct	Educate and train workers of OLAM PALM Gabon and its subcontractors on the rules of conduct	Number of meetings with workers							
Workers and residents	Maintenance and harvesting work From the planting movement of vehicles, trucks and other gear	Noise and vibration	Working at the hours of the day	Very precise working hours	Complaint Registration Report	Impact Register Book	HR Manager Responsible HSE of Olam Palm Gabon	DGEPN + associated Administrations	For the duration of the project
			Equip workers with PPE (EAR buds)	Purchase of PPE and obligatory port	Number of persons carrying EPI	Control report Team Environment Olam Palm Gabon			
			Inform local communities of hours of activity	Information meeting	Meeting Report and attendance list				
Air-groundwater, surface, and runoff-soil-workers	Waste Management Industrial waste (pesticide residues or herbicides and unused fertilizers, engine filters, batteries and used batteries, etc.)	Environmental Pollution and contamination	Train and educate staff on good storage practices for hazardous products	Training and awareness of workers	Training sheets; Number of awareness meeting	Control report Team Environment Olam Palm Gabon	Responsible Hse of Olam Palm Gabon.	DGEPN + associated Administrations	For the duration of the project.
			Respect the mode and storage conditions of each hazardous product	Product storage Procedures	Procedures put in place				
			Ensure the existence of a containment or absorption device in the event of	Setting up containment devices	Team Control Report Hse of Olam Palm Gabon				

			spillage of the products						
			filters, plastics and fertilizer bags will be collected, stored and delivered to a claimant for recycling when that exists in Gabon. If necessary, the waste will be stored on site pending the appropriate management solution.	Establishment of a service contract	Waste recovery slip; Volume of stored waste		Waste recovery slip		
			Spare parts of the factory vehicles and workshops will be collected, stored and recovered by an authorized service provider for disposal/recycling	Establishment of a service contract	Waste recovery slip				
			Storing hydrocarbons under approved conditions	Storage in approved tanks	Type of tank set up				
			Establish a sustainable waste management system (collection, selective sorting, storage, disposal or recycling)	Waste Management Plan	Impact Report		Impact Register Book		

Operation Phase (Maintenance and harvesting)

Receiving media	Impact and risk or danger factors	Impacts/Risks or dangers	Mitigation or prevention measures	Tasks	Monitoring indicators	Source of verification	Responsibilities		Frequency
							of execution	of control	

Air-groundwater, surface, and runoff-soil-workers	Waste Management Household waste from the life base (food waste, plastic bottles, cans, etc.)	Environmental Pollution and contamination	Application of waste management procedures	Collect, sort and store waste according to OLAM PALM Waste management procedures	Waste Management Plan	Waste Management Plan	Responsible Hse of Olam Palm Gabon.	DGEPN + associated Administrations	For the duration of the project
			Equip the site with garbage bins with lids	Purchase of garbage bins	Number of garbage bins on site				
			Provide for the installation of a garbage disposal pit complying with the protection standards (geotextile membrane, drain, etc.)	Creation of the burial pit	Presence of the Pit				
			Implementing the health, hygiene and safety policy of Olam Palm Gabon	Application of the policy Hse of Olam Palm Gabon	Impact Report				
			Application of waste storage standards	Setting up waste disposal sites according to the standards in force (in particular Decree No. 541/PR/MEFEP EPN regulating the elimination of waste), far from the waters	Impact Report				
Waste Management Life and office waste water	Environmental Pollution and contamination	Develop wastewater management systems (sumps, pits) in accordance with current standards	Construction of drainable Septic tanks	Presence of pits	Team Control Report Hse Olam Palm Gabon	Responsible for sustainable development (CRS managers); Social team	DGEPN + associated Administrations	During the operation phase of the Palm Grove	
		Develop a sewage treatment centre from the life base and offices	Construction of domestic waste water treatment pond	Abatement of the pollutant load from the waste water at the exit of the basin					
Local communities-employment	Maintenance and harvesting work Activity of the Palm Grove (arrival of foreign labour, non-observance	Conflicts between Olam Palm Gabon and local communities	Inform and educate people on the project (ins and outs)	Information and Awareness Meeting	Meeting Report and attendance list	Team Control Report Social/CR&S Olam Palm Gabon	Responsible for sustainable development	DGEPN + associated Administrations	During the operation phase of the Palm Grove
			To use the local workforce as a priority in	Employment of villagers in the project area as a priority	Number of jobs in the premises				

of agreements between village communities and Olam Palm Gabon)		relation to that coming from other localities				(CRS manager); Team Hse; Social team Mapping team; HRD Olam Palm Gabon		
		Review of grievances of local communities impacted and respect of the agreements reached in the framework of the video	Setting up the CLIP	Social Contract				
		Set up a village monitoring Committee	Meeting to set up the Monitoring committee	Monitoring committee set up	Texts or document setting up the Monitoring committee			
		Keep after consultation with the populations of the village activity areas	Identification of areas	Number of identified area (area)	Area mapping			
	Employment (reduction of unemployment)	Establishment of a hiring policy that promotes the recruitment of people from the riparian populations	Employment of Villagers	Number of local employees	Employment Contracts	HRD Olam Palm Gabon		
		Training of the maneuvers recruited in order to raise the level of skills envisaged	Schedule training Sessions	Attendance form at the training sessions	Control report Team Environment Olam Palm Gabon			

Operation Phase (Maintenance and harvesting)

Receiving media	Impact and risk or danger factors	Impacts/Risks or dangers	Mitigation or prevention measures	Tasks	Monitoring indicators	Source of verification	Responsibilities		Frequency
							of execution	of control	
Health and safety of workers	Maintenance work Management of phytosanitary Products Handling, product preparation, product preservation and spreading	Intoxication/ Accidents	Respect the protection procedures	Wash the gloves before removing them; Rinse hands with clear water; Wash the detergent-proof equipment and store them in a room other than the storage of the products, or use disposable combinations strictly for the application of phytosanitary products	Presence of safety procedures signs. Monitoring of EPI Stock	Control report Team Environment Olam Palm Gabon Team Hse	subcontractors; Team leader HSE; Hrd Agricultural engineers; Plantation Manager Olam Palm Gabon	DGEPN + associated Administrations	For the duration of the project activity
			Availability of PPE (protective visors, waterproof suit, pair of bootss Covered by the combination, etc.) Adapted to the work of spreading phytosanitary products. For example, these PPE will prevent Eye damage in case of accidental projection of concentrated product (Cava SparkliThat explodes on the ground)	Purchase of PPE and mandatory port by employees	Respect for the port of EPI	Reports Control team Environment Olam Palm GabonTeam Hse			
			Enforce procedures Hse	Ban on Pregnant or breastfeeding women To handle phytosanitary products	Procedures Hse Put in place				

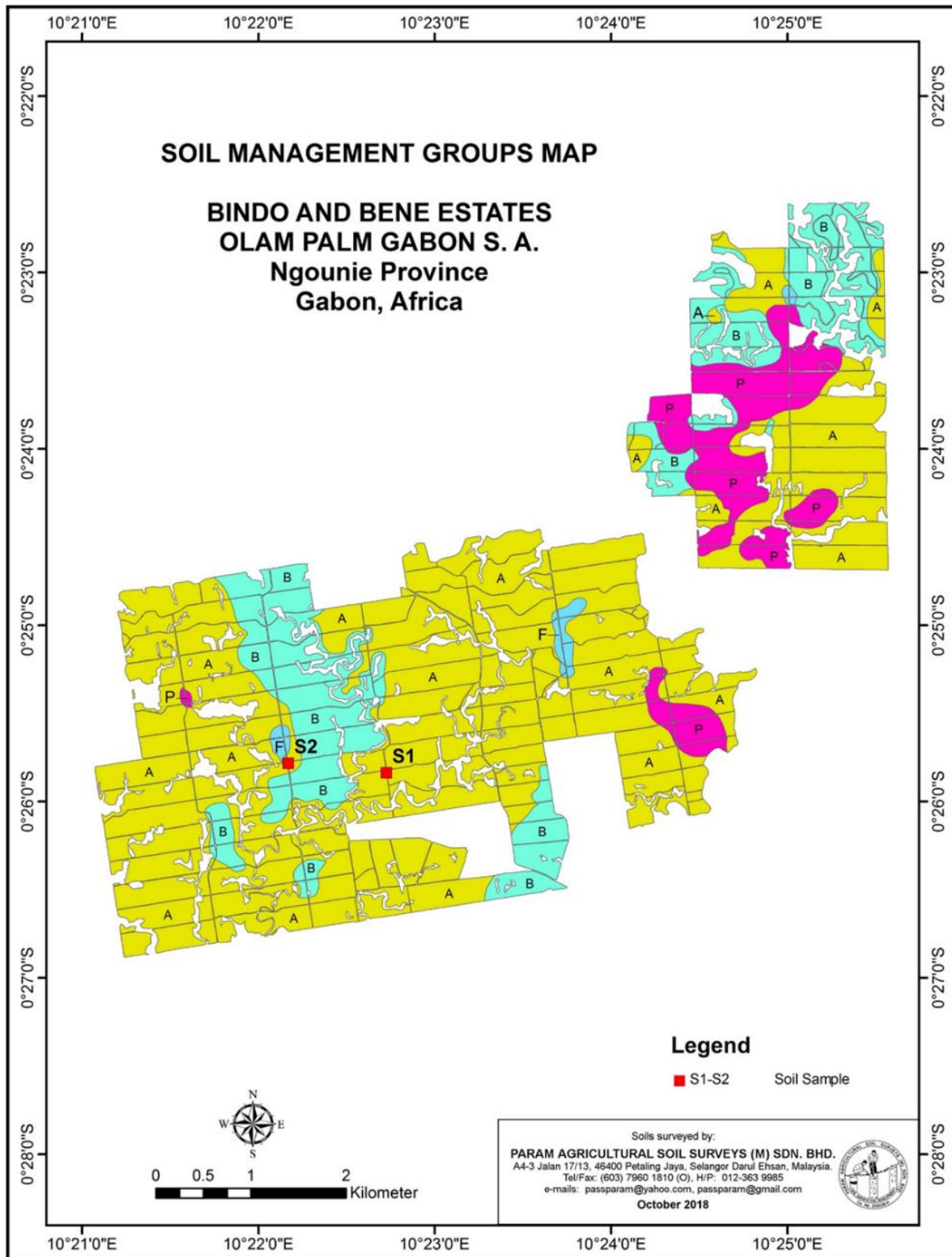
			Prohibited from feeding in places of storage, and or spreading	Prohibiting workers from feeding in different places	Indication signs of Prohibition; Sanitary Evacuation Plan				
			Respect for good phytosanitary practices	Training and educating workers on good phytosanitary practices	Display of use protocols for phytosanitary products				
			Make available to workers the explanatory sheets of pictograms on phytosanitary and fertilizer products to be used	Elaboration of the manual for the use of phytosanitary products	Security data sheets put in place				
			Equip the teams with first aid kits and provide for a sanitary evacuation procedure in case of fire poisoning (release of toxic fumes) and accidents	First Aid Kit Purchase ; Operational rolling stock for emergency evacuations	First Aid Kit Presence Rolling stock for evacuation available				

Operation Phase (Maintenance and harvesting)

Receiving media	Impact and risk or danger factors	Impacts/Risks or dangers	Mitigation or prevention measures	Tasks	Monitoring indicators	Source of verification	Responsibilities		Frequency
							of execution	of control	
Health and safety of workers	Harvesting work The cutting of diets and pruning of palms with oils	Risk of accidents (injuries, stings, bites, falls, etc.)	Provision of personal protective equipment (combination, safety footwear, helmet, gloves, etc.)	PPE purchases and mandatory port by employees	presence of PPE; Number of people carrying EPI on the site	Impact Register Book	subcontractors; Head of HSE, HRD Olam Palm Gabon	DGEPN + associated Administrations	For the duration of the project activity
			Provide the teams with communication equipment	Purchasing of communication equipment	Presence of communication equipment				
			Equip teams with first aid kits	Purchases of first aid equipment; Training and awareness of workers	Medical register for the treatment and follow-up of sick or injured persons				
			Application and compliance with the sanitary evacuation plan	-Set up an emergency medical evacuation plan for the different types of accidents and injuries that may occur; - Provide evacuation means on	Existing evacuation Plan; Number of evacuations recorded				
		Diseases	Offer awareness campaigns on sexually transmitted infections (STIs/Hiv) and sexual behaviour at risk and encouraging voluntary testing	Awareness Session	Awareness Meeting Reports				
			Identification of all workers	Schedule medical visits to staff	Number of medical visits				
			Implement the Rules of procedure of Olam Palm Gabon and the Gabonese Labour Code;	Prohibit the consumption of narcotics and alcohol on the site	Number of accidents related to the use of drugs and/or alcohol				

			Breathalyzer							
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Soil Management Groups & Plans



Soil Management Group	Soil Map Units	Main Characteristic/ Limitation	Management Practices Needed	Extent	
				Ha	%
A	Kbg/2 Kbg/3 Trp/2 Trp/3 Tbk/2 Kcr/2	Deep (>100 cm) to moderately deep (50-100 cm) fine sandy clay to clay (>35% clay) textured soils. Low fertility.	Soil erosion monitoring and mitigation: • cover crop establishment. • terracing. • frond stacking. Good fertilizer programme.	1,682.5	43.3
B	Nmi/3 Nag/2 Rsu/2	Deep (>100 cm) to moderately deep (50-100 cm) well drained soils. Texture sandy clay loam (18-35% clay). Moisture stress and yield fluctuations. Low fertility.	Soil erosion monitoring and mitigation: • cover crop establishment. • terracing. • frond stacking. • EFB application. Good fertilizer programme. Monitor K levels.	460.8	19.2
F	Kuh/2 Kuh/3	Shallow (<50 cm) soils with sandy clay to sandy clay loam texture. Moderately well drained. Moisture stress and yield fluctuation. Wind damage. Soils often on steep slopes.	• EFB application. • Frond stacking. • Erosion monitoring and mitigation. • Soil moisture conservation. • Cover crop establishment. • Fertilizers in holes	21.3	0.9
P	Jta/2	Shallow (<50 cm) well drained soils. Gravelly sandy clay textures. Shallow soil depth. Dense lateritic/gravel layer (<50 cm). Low fertility. Poor rooting. Moisture stress. Wind damage.	Soil erosion monitoring and mitigation: • cover crop/wind breaks establishment. • terracing. • frond stacking. • EFB application. • Moisture conservation. Good fertilizer programme.	235.9	9.8
				2400.5	100

4.3 Management and Mitigation Plans for Carbon

Due to site selection, BB will be a net sequestration project. In general, Olam has committed NOT to develop on peatlands and high carbon stock forest determined through a multi stakeholder process in key origins.

Other measures will be implemented to limit emissions of certain factors (complementing the compensation made by plantations):

- i. To limit site preparation to an absolute minimum, promote site preparation in highly degraded areas and to avoid swampy areas as far as possible;
- ii. To quickly re-use the biomass residues to offset emissions (energy biomass, timber, etc.);
- iii. Avoid losses and unnecessary consumption by ensuring regular maintenance of equipment and optimizing travel;
- iv. To rehabilitate the infrastructure areas to allow for restoration of the natural environment at the end of the project.

- v. Continue to measure, disclose, and manage greenhouse gas emissions reductions through Carbon Disclosure Project (CDP).

4.4 HCV Threat Assessment

The approach used by the HCV assessment team for threat assessment was in-depth consultation with the technical experts during the restitution workshop. This approach used expert knowledge combined with information collected in the field and during stakeholder consultation. Each HCV was examined and both the current and potential threats (should the proposed oil palm project go ahead), as well as direct and indirect causes of threats.

HCV	Brief description of value present	Main threats
1	<p>Species diversity</p> <ul style="list-style-type: none"> Chimpanzees, gorillas and elephants in MDF forest, that are representative species of the Bas Ogooué Ramsar site. This forest is also HCV1 as a landscape buffer for the Ogooué river 	<p>Current</p> <ul style="list-style-type: none"> Loss of forest to village plantations Hunting by the nearby communities Timber harvesting by communities <p>Potential</p> <ul style="list-style-type: none"> Increased hunting pressure in the HCVMA due to loss of hunting areas to palm plantations Increased hunting pressure on remaining forest blocks outside the concession (especially east of the concession) that do not fall within Olam's management Loss of forest from conversion to oil palm Loss of forest in the HCVMA from conversion for village plantations Loss of forest in the contiguous forest block to the east and north of the HCVMA from conversion for village plantations, due to scarcity of farmland Fragmentation of the HCV1 MA and increased access to communities from opening of road/track to Ngouabilaghe Disturbance from mechanical operations during land preparation, road building etc.
4	<p>Basic ecosystem services</p> <ul style="list-style-type: none"> Hydrological functions to maintain water quality and quantity for community uses and ecological functions of the Ramsar site 	<p>Current</p> <ul style="list-style-type: none"> Low level forest loss due to clearing for subsistence agriculture and small-scale logging/ timber extraction Loss of water quality due to fishing using poisons/chemicals Inadequate riparian buffer zones in planted area of concession <p>Potential</p> <ul style="list-style-type: none"> Loss of water quality and quantity due to clearance of riparian forest for palm oil plantation (high level threat) Loss of water quality due to clearance of riparian forest for village plantations Loss of potable water supply in concession and downstream Loss of water quality in and immediately downstream of the concession due to nutrient leaching / fertiliser runoff or other pollution, sedimentation caused by river crossings and roads Loss of water quality downstream along the Ogooué river and in the downstream Ramsar site due to leaching, pollution or sedimentation caused by river crossings and roads Loss of water quality in and immediately downstream of the concession due to nutrient leaching / fertiliser runoff, pesticides or other pollution, sedimentation caused by increased use of poisons/chemicals for fishing Pollution of groundwater used for drinking by leaching of agrochemical
5	Basic Community Needs	Current

	<ul style="list-style-type: none"> Provision of food from farming, hunting, timber harvesting, fishing and NTFP gathering in the forest zone Water supply to communities 	<ul style="list-style-type: none"> Bushmeat supply is already dwindling as hunted species numbers appear to be in low numbers from overhunting (Alleged) pollution of river water downstream of the planted area by SIAT/Olam's operations Loss of water quality and declining fish stocks due to fishing using poisons/chemicals <p>Potential</p> <ul style="list-style-type: none"> Loss of fertile forest land for farming if riparian areas are replaced by oil palm or reserved as conservation buffer zones Reduced availability of viable farmland east of the national road due to establishment of HCV1 MA and conversion for oil palm Loss of access to traditional hunting, fuelwood collection, medicinal plant collection, fishing and NTFP grounds during hours of traditional use Hunting ban causes loss of access to primary hunting area in the east of the concession (HCV1 MA) Overharvesting of timber, fuelwood, medicinal plants and NTFPs (esp Marantaceae leaves) in HCV5 areas and remaining forest due to reduction in available harvesting areas caused by conversion of palm and establishment of HCV1 MA Reduction of fish stocks and loss of fish habitat due to impacts on water quality and quantity Loss of potable surface and river water due to pollution Pollution of groundwater used for drinking by leaching of agrochemical
6	<p>Cultural values</p> <ul style="list-style-type: none"> Old villages Sacred sites 	<p>Current none</p> <p>Potential</p> <ul style="list-style-type: none"> Loss of access Damage to sites or resource from land clearance Perceived degradation of the value of HCV6 sites caused by enclaving within plantations Taboo access of sacred sites by unauthorised persons, e.g. plantation workers, possibly leading to community conflict or discontent

4.5 Management and monitoring recommendations

HCV	Threats	Management recommendations	Monitoring recommendations
1	<p>Current</p> <ul style="list-style-type: none"> Loss of forest to village plantations Overhunting by the nearby communities Timber harvesting by communities <p>Potential</p> <ul style="list-style-type: none"> Increased hunting pressure in the HCVMA due to loss of hunting areas to palm plantations Increased hunting pressure on remaining 	<ul style="list-style-type: none"> Establish and demarcate clearly with signs the boundaries of the 2,919 ha HCV1MA Ensure clearance teams are fully aware of and respect the HCV1 MA boundaries before and during clearance Develop management restrictions for the HCVMA, including: <ul style="list-style-type: none"> Ban on all illegal hunting and hunting of HCV1 species (as minimum) and consider a 	<ul style="list-style-type: none"> Conduct monitoring of great ape and elephant populations every 1-2 years, for instance using targeted recce surveys. Conduct regular anti-poaching patrols (weekly or twice a month) e.g. using SMART or similar platform. Conduct hunter surveys annually to understand main hunting areas and assess trends in bushmeat availability.

	<p>forest blocks outside the concession (especially east of the concession) that do not fall within Olam's management</p> <ul style="list-style-type: none"> • Loss of forest from conversion to oil palm • Loss of forest in the HCVMA from conversion for village plantations • Loss of forest in the contiguous forest block to the east and north of the HCVMA from conversion for village plantations, due to scarcity of farmland • Fragmentation of the HCV1 MA and increased access to communities from opening of road/track to Nguouabilaghe 	<p>complete hunting ban for all species if enforceable.</p> <ul style="list-style-type: none"> ○ Ban on conversion for farming and logging in the HCVMA ○ Explore options for allowing sustainable, low-intensity collection of fruit and nuts and subsistence fishing (no use of poison) in the HCVMA ○ Explore options to allow harvesting of Marantaceae leaves in the HCVMA based on discussion with communities about key harvesting areas – can needs be met elsewhere <ul style="list-style-type: none"> • Extensive and regular sensitisation of HCV1 MA boundary and restrictions with all surrounding communities, including provision of maps and posters listing restrictions, regular awareness raising activities including of children at local schools • Extensive and regular sensitisation of HCV1 MA boundary and interdictions with staff and workers, including provision of maps and posters listing restrictions and empowerment of staff to support HCV teams by sharing any observations of HCV species and threats • Establish an anti-poaching/hunting team. Explore hiring to the team as a priority the main hunters from the area • Engage with the appropriate local authorities to reduce illegal hunting inside and outside the concession, and put in place effective law enforcement procedures. • Engage with ANPN or Ministère de la Forêt, de la Mer et de l'Environnement and the Ramsar management committee to explore more formal protection for the forest block northeast of the concession towards the Ogooue • During the FPIC process: 	<ul style="list-style-type: none"> • Establish protocol for monitoring performance of HCV team including anti-poaching patrol, e.g. using SMART • Bi-annual monitoring of set-aside areas to show zero conversion of forest, using satellite imagery or similar (e.g. GFW alerts) • Establish a co-management committee to develop and monitor permitted community activities (harvesting, fishing, collection) in the HCV1 MA
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		<ul style="list-style-type: none"> ○ Discuss alternative options to commercial bushmeat hunting, such as provision of livestock, fish farming or subsidised and improved access to bought protein ○ To reduce pressure on the HCV1 MA, support communities to understand future farmland needs and availability (future land use projections), and to secure and improve productivity of land ● During negotiations with Ngouabilaghe village discuss their demands versus potential threat to the HCV1 MA of opening a larger road across the concession. Guarantee access across the route but prioritise not opening a (larger) road in exchange for other compensation ● Conduct fish sampling during the dry season to verify if unique species or assemblages are present in perennial refuges. 	
4	<p>Current</p> <ul style="list-style-type: none"> ● Low level forest loss due to clearing for subsistence agriculture and small-scale logging/timber extraction ● Loss of water quality due to fishing using poisons/chemicals ● Inadequate riparian buffer zones in planted area of concession <p>Potential</p> <ul style="list-style-type: none"> ● Loss of water quality and quantity due to clearance of riparian forest for palm oil plantation (high level threat) ● Loss of water quality due to clearance of riparian forest for village plantations ● Loss of potable water supply in concession and downstream ● Loss of water quality in and immediately 	<ul style="list-style-type: none"> ● Re-map river and stream locations to correct inaccuracies of current map ● Establish, demarcate with signs and protect riparian buffer zones forests (these should be identified by following streams and tributaries to their source). Buffer zones must be 100 m on each side of the Béné and 40 m on each side of other tributaries ● Increase the size of buffer zones in the planted area to 100 m for the Béné and 40 m for smaller streams. If buffer zones are already planted it is recommended to leave palms standing for soil stabilisation and ground cover, but all management activities and agrochemical/fertiliser application should cease to allow regeneration of natural vegetation. Explore assisted regeneration if climbers/cover crops suppress natural regeneration 	<ul style="list-style-type: none"> ● Monitor activities of roading teams to ensure buffer zones are respected and roading across rivers is minimised ● Establish network of independent surface/river water monitoring points in the concession and downstream; ● Establish an enhanced, higher frequency water quality and quantity monitoring protocol using the monitoring station network, to include as minimum agrichemical, suspended matter, sediment load. Monitoring frequency should be increased in the wet season. Results should be shared with Ramsar management committee and appropriate government departments ● Establish regular groundwater monitoring protocol focused on boreholes along the Lambarene-Libreville road, with

	<p>downstream of the concession due to nutrient leaching / fertiliser runoff or other pollution, sedimentation caused by river crossings and roads</p> <ul style="list-style-type: none"> • Loss of water quality downstream along the Ogooué river and in the downstream Ramsar site due to leaching, pollution or sedimentation caused by river crossings and roads • Loss of water quality in and immediately downstream of the concession due to nutrient leaching / fertiliser runoff or other pollution, sedimentation caused by increased use of poisons/chemicals for fishing • Pollution of groundwater used for drinking by leaching of agrochemical 	<ul style="list-style-type: none"> • Ban logging and farming in HCV4 MAs based on discussions with communities to ensure sufficient farmland and timber needs are met elsewhere, in line with the FPIC process • Allow fishing in rivers but ban use of poisons/chemicals • Minimise roading across HCV4 MAs by communicating with operations/clearance teams – roading should not follow the usual blocking pattern • Establish roads and bridges following BMPs, including building during the dry season but based on anticipated maximum height and width during the wet season • Extensive and regular sensitisation of HCV4 MA boundaries and restrictions with all surrounding communities, including provision of maps and posters listing restrictions, • Extensive and regular sensitisation of HCV4 MA boundary and interdictions with staff and workers, including provision of maps and posters listing restrictions • Development and implementation of dedicated SOPs regarding chemical use for HCV4 MAs • Conduct further surveys on soil type and percolation rates in the proposed development area to better understand the risk of polluting groundwater used by communities • Develop a tailored and preferably reduced fertilisation regime that minimises the risk of polluting groundwater. Fertilisation and chemical SOPs should be made public or at least shared with TNC for feedback 	<p>increased frequency of monitoring in the dry season</p> <ul style="list-style-type: none"> • Regular monitoring of forest set-aside zones shows no encroachment by communities and operations; • Bi-annual monitoring of set-aside zone shows at least no decrease in canopy cover; • Set restoration goal (natural regrowth) for riparian zone with annual milestones; • Regular review and monitoring of implementation of relevant Olam's SOPs, including HCV and operations teams. Particular focus should be given to ensure fertiliser teams and chemical sprayers respect increased buffer zones in the planted area
5	<p>Current</p> <ul style="list-style-type: none"> • Bushmeat supply is already dwindling as hunted species numbers appear to be in 	<ul style="list-style-type: none"> • During the FPIC process and negotiations: <ul style="list-style-type: none"> ○ Clarify with Bindo village members whether there are any 	<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

	<p>low numbers from overhunting</p> <ul style="list-style-type: none"> • (Alleged) pollution of river water downstream of the planted area by SIAT/Olam's operations • Loss of water quality and declining fish stocks due to fishing using poisons/chemicals <p>Potential</p> <ul style="list-style-type: none"> • Loss of fertile forest land for farming if riparian areas are replaced by oil palm or reserved as conservation buffer zones • Reduced availability of viable farmland east of the national road due to establishment of HCV1 MA and conversion for oil palm • Loss of access to traditional hunting, fuelwood collection, medicinal plants, fishing and NTFP grounds during hours of traditional use • Hunting ban causes loss of access to primary hunting area in the east of the concession (HCV1 MA) • Overharvesting of timber, fuelwood, medicinal plants, and NTFPs (esp Marantaceae leaves) in HCV5 areas and remaining forest due to reduction in available harvesting areas caused by conversion of palm and establishment of HCV1 MA • Reduction of fish stocks and loss of fish habitat due to impacts on water quality and quantity • Loss of potable surface and river water due to pollution • Pollution of groundwater used for drinking by leaching of agrochemical 	<p>use areas (especially farms) outside the BB concession that were not captured during the participatory mapping</p> <ul style="list-style-type: none"> ○ Avoid cash compensation and focus on rural development activities (e.g. securing farmland and increasing productivity) ○ Ensure communities have full understanding of pros and cons of oil palm development, particularly in terms of future farmland needs and hunting restrictions ○ Discuss alternative options to commercial bushmeat hunting, such as provision of livestock, fish farming or subsidised and improved access to bought protein ○ To reduce pressure on the HCV1 MA, support communities to understand future farmland needs and availability (future land use projections), and to secure and improve productivity of land ○ With Ngouabilaghe village discuss their demands versus potential threat to the HCV1 MA of opening a larger road across the concession. Guarantee access across the route but prioritise not opening a (larger) road in exchange for other compensation <ul style="list-style-type: none"> • Ensure community access to all HCV5 and HCV6 areas or other community use areas outside the concession at all times • 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, and ensure adequate access to medicines and 	<p>mechanism for the findings of this participatory monitoring to be fed back into management measures in place (adaptive management).</p> <ul style="list-style-type: none"> • Cross-check participatory monitoring of fishing, hunting and farming with findings from water monitoring and anti-poaching
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		<p>healthcare; ensure controlled access for fishing and prohibition of poisons/chemicals for fishing;</p> <ul style="list-style-type: none"> • 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 great apes and elephants)- 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. • Establish co-management committees with community representatives to: <ul style="list-style-type: none"> ○ Secure and improve productivity of farmland ○ Control all hunting in forest zones coupled with provision of protein sources in the zone ○ Agree and monitor areas for fishing, fuelwood, medicinal plant, timber harvest and NTFP collection and harvesting, and set sustainable extraction rates ○ Ensure a continuous social engagement process to find mutually agreeable solutions to HCV 5 threats and formalise in codes of conduct and community engagement policies • Explore supporting the training (via 3rd parties) of village representatives • Conduct capacity building of Olam social team in Makouke to ensure they have the capacity to effectively lead community engagement activities 	
6	<p>Potential</p> <ul style="list-style-type: none"> • Loss of access • Damage to sites or resource from land clearance • Perceived degradation of the value of HCV6 sites caused by enclaving within plantations 	<ul style="list-style-type: none"> • Review precautionary HCV6 buffer zones during negotiations to enable all communities to have access to their HCV 6 sites and to avoid enclaving sites • Sensitise all communities that have identified any HCV 6 sites that are not on the validated HCV 5 & 6 maps 	<ul style="list-style-type: none"> • Develop a simple HCV 6 monitoring system and ensure annual internal reporting against it

	<ul style="list-style-type: none"> • Taboo access of sacred sites by unauthorised persons, e.g. plantation workers, possibly leading to community conflict or discontent 	<ul style="list-style-type: none"> • Develop robust SOP for the identification, demarcation and enclavement and protection of all HCV 6 sites with the communities • Conduct training for workers on SOPs for all HCV 6 sites to ensure no trespassing into HCV 6 sites and buffer zones • Ensure community member present when clearing operations occurring in any HCV 6 sensitive zones 	
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4.6 Full HCV and HCV management area maps

All HCV Management Areas (MA) and provisional HCSA areas are shown below. Note that the HCV1 MA is considered final, the HCV4 MA are provisional (subject to updated mapping of rivers and streams by Olam), and HCV5 areas are subject to negotiation with Olam. The HCS forest area will not be developed at present, pending further discussions about an ‘adapted’ Gabon-relevant HCS approach endorsed by national stakeholders and RSPO.

Size of the HCV management areas:

HCV 1 & 4	HCV 5,6	Total
2795 ha	941 ha (pending negotiation)	<ul style="list-style-type: none"> ○ 3736.4 ha ○ (Includes 941 ha of HCV5/6 areas pending negotiation)

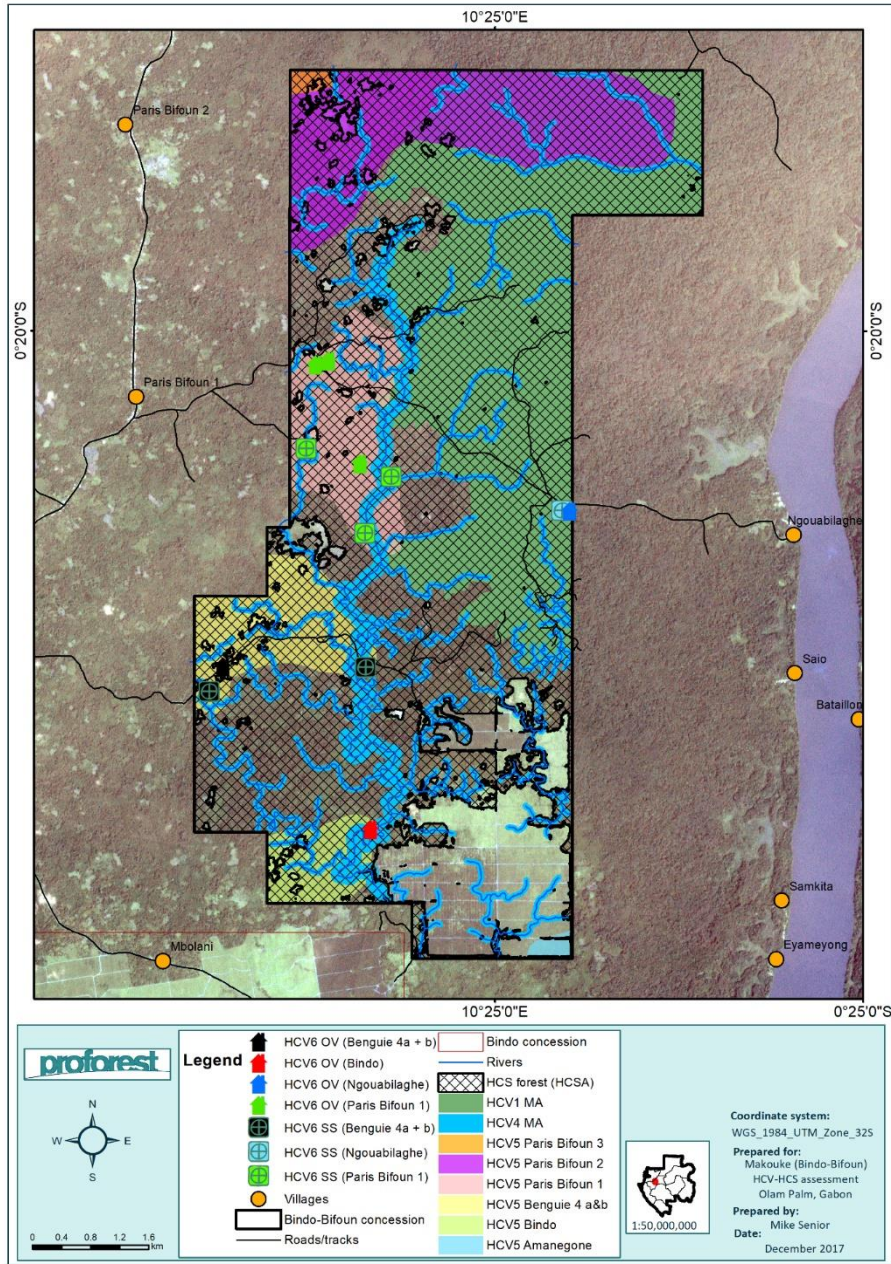


Figure 16: Map of final HCV1 MA, provisional HCV4 MAs, HCV5, HCV6 areas, and HCS forest. OV=Old village, SS=sacred site. Source: The HCV areas and HCV Management areas were defined by the assessment team during the expert workshop.

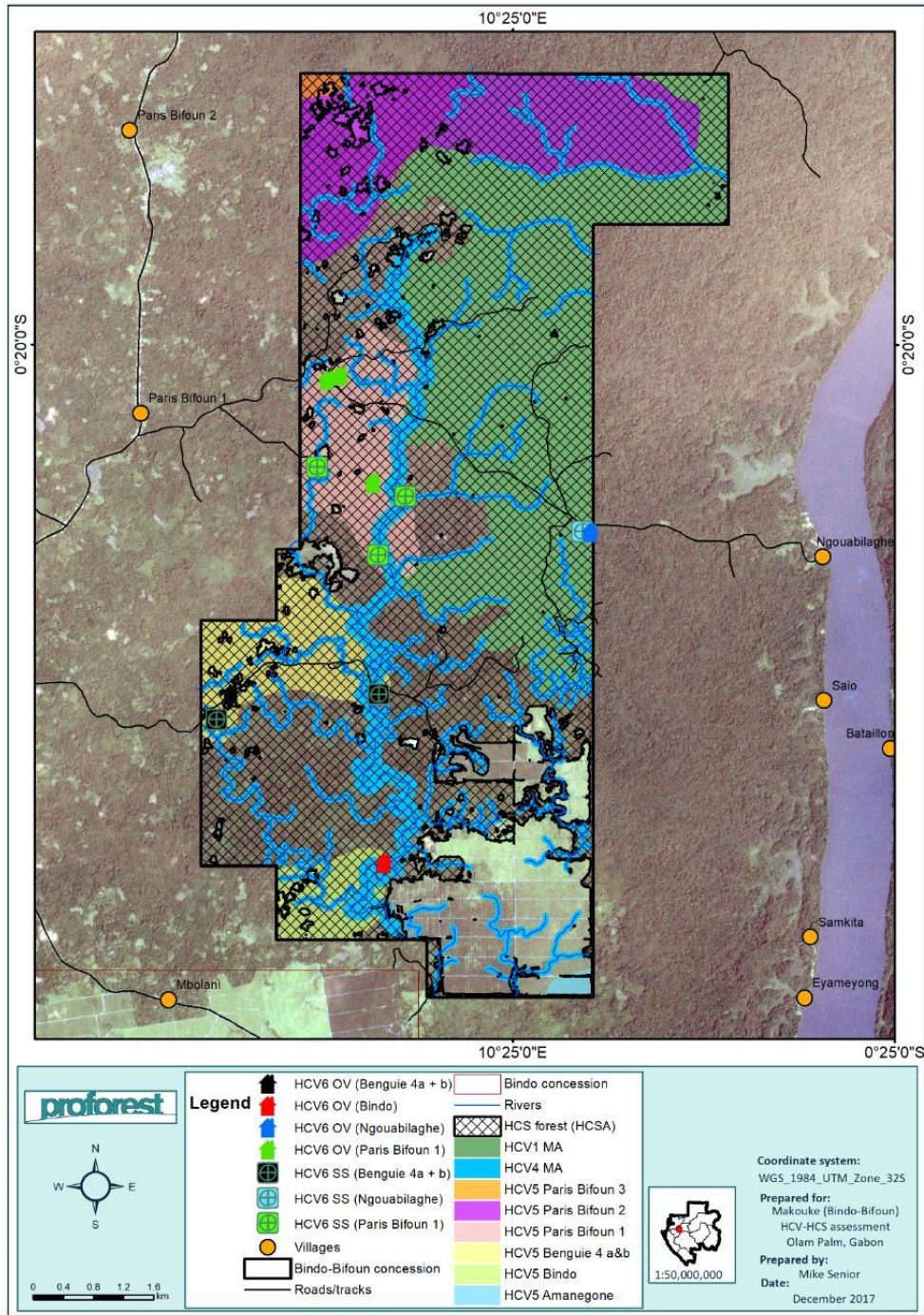


Figure 17: Integrated landuse map which shows the overview of HCV, HCS and community set aside

5. INTERNAL RESPONSIBILITY

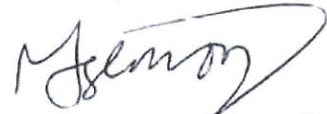
THIS DOCUMENT IS THE SUMMARY OF SEIA (SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT) AND HCV (HIGH CONSERVATION VALUE) ASSESSMENTS FOR THE BINDO BIFOUN (MAKOUKE) AREA AND HAS BEEN ACCEPTED BY THE MANAGEMENT OF OPG. WE THE UNDERSIGNED ACCEPT RESPONSIBILITY FOR THE ASSESSMENTS AND SUMMARY.

Signed on behalf of SEIA assessors
Terea, Gabon



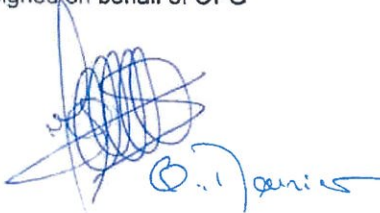
C. N. N. N. N.

Signed on behalf of HCV Assessors
Proforest Ltd, UK



MIKE SENIOR

Signed on behalf of OPG



Quentin Meunier

Head – Environment and Sustainability, Olam Gabon
Quentin Meunier