



HCV Assessment Summary

Mouila Lot 3, Ngounié, Gabon,

23 March 2015

About Proforest

Proforest is an independent company working with natural resource management and specialising in practical approaches to sustainability.

Our work ranges from international policy development to the practical implementation of requirements on the ground, with a particular focus on turning policy into practice. Our extensive and up-to-date knowledge of the international context ensures that our work for individual companies and organisations is set within an appropriate framework. At the same time, we are able to bring a wealth of current practical experience to policy development processes and debates.

The Proforest team is international and multilingual and has a broad variety of backgrounds, ranging from industry to academia and NGOs. This allows us to work comfortably in many types of organisations, as well as in a range of cultures. We have in-house knowledge of more than 15 languages, including Mandarin, Malay, French, Spanish and Portuguese.

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

For this report, your contact person is:

David Hoyle

David@proforest.net

Proforest

South Suite, Frewin Chambers,
Frewin Court, Oxford OX1 3HZ
United Kingdom

E: info@proforest.net

T: +44 (0) 1865 243439

Proforest is registered in England and Wales
Company number 3893149

Cover Page

Date of report:	23rd March 2015
Name of lead assessor: (ALS License no.)	David Hoyle (Provisional ALS15008DH)
Contact of lead assessor:	Proforest South Suite, Frewin Chambers, Frewin Court, Oxford OX1 3HZ, UK T: +44 (0) 1865 243439 E: david@proforest.net
Date of Assessment:	July 2014-March 2015
ALS tier rating	Tier 1
Assessment Location:	Ngounié Province, southern Gabon (near Mouila town)
Size of Assessment area	23,780 hectares (ha)
Current / planned land-use	Planned for conversion to oil palm plantation and mill
Certification scheme	Under RSPO
Organisation commissioning HCV assessment:	Olam Palm Gabon Dr Christopher Stewart Mbolo, Libreville T: +241 0600 55 51 E: christopher.stewart@olamnet.com

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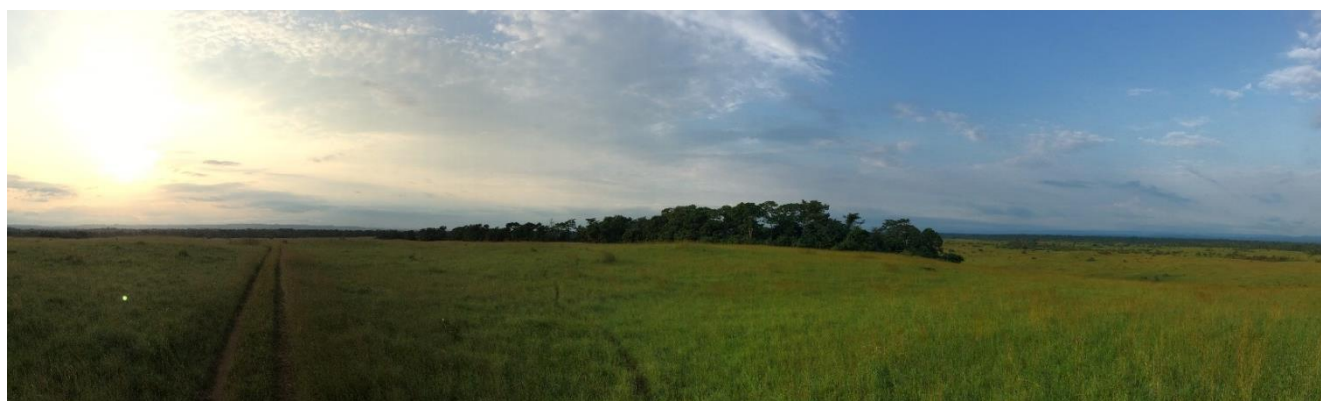


Image 1: View of the northern part of Mouila Lot 3

1 Introduction and background

Olam Palm Gabon has successfully applied for a long-term land lease from the Ministry of Economy, Employment and Sustainable Development for an area of land covering 23,780 hectares (ha.) in Ngounié Province, southern Gabon, for the development of a new oil palm plantation, on the basis of land suitability mapping by the Advisory Council of the National Land-use Plan (*Plan National d'Aménagement des Terres*, PNAT). The site is the third Olam palm concession in the Province and will hereafter be referred to as *Mouila Lot 3* or *Lot 3*. It is located 5 km to the south of the Provincial capital, the town of Mouila, approximately 450 km from Libreville, between latitudes 01°52'S and 02°10'S and longitudes 10°54'E and 11°10'E (see Figure 1).

The Mouila Lot 3 site was selected by the Government of Gabon as being potentially suitable for oil palm development, using a series of criteria including rainfall, distance from protected areas, topography, soils, access to workforce, minimising conflict with other land-uses etc. At the time of the HCV assessment, clearing and preparation of Lot 3 for a plantation had not commenced by OPG, with the exception of a nursery site located in the savannah zone. The nursery site was evaluated by the Environmental and Social Impact Assessment (ESIA) technical team of experts, who prepared a project notice report and accompanying environmental and social management plan. The nursery site has been prepared with the authorisation of the Department of Environment (DGE) and the prior consent of the local village.

HCV Assessment

This report lays out the summary findings of an independent High Conservation Value (HCV) assessment for the proposed oil palm development in Lot 3 for Olam Palm Gabon (OPG). The assessment was carried out between July 2014 and March 2015 by Proforest. This report presents the HCVs that have been identified in the proposed concession area and makes recommendations for their management and monitoring.

In carrying out the HCV study, the Proforest assessment team used and cross-referenced three principal guidance documents:

- HCV Resource Network (2013). *Common Guidance for the identification of High Conservation Values*.
- HCV Resource Network (2014). *Common Guidance for the management and monitoring of High Conservation Values*.
- WWF, Proforest. 2008. *Une interprétation nationale des Forêts à Haute Valeur pour la Conservation pour le Gabon* (draft).

Site description

Lot 3 is located in the forest-savannah transition region of southern Gabon, in one of the two savannah fingers reaching northwards into Gabon from the Republic of Congo (see Figure 1). These savannahs / forest-savannah transition zones, whilst not common in the national context, are not uncommon in the southern parts of Gabon. A combination of historical exploitation and edaphic factors has shaped the vegetation in this area. Almost all the forest areas have experienced disturbance or degradation, which reflects the degree of anthropogenic activity.

Lot 3 is found on the western side of the River Ngounié flood plain, the concession overlaps with the catchments of five rivers: Douya, Ivevoula, Doumina, Idigui, and Dibotsa, which have their sources in the Tandou Mountains of the Mayombe Massif to the west and flow eastwards emptying into the River Ngounié. The concession is delimited by the N1 road

(Libreville – Mouila – Tchibanga Highway) to the east, the River Douya to the north, the lower edge of the Tandou Escarpment to the west and the River Dibotsa to the south.

Lot 3 lies on a flat to gently undulating (< 6 degrees) plain over limestone/shale bedrock, yielding soils of moderate to low fertility. However, most soils are suitable for palm plantations, with fertiliser additions as required for economic yields. The elevation of Mouila Lot 3 ranges from 90 to 130 m. above mean sea level. Located in the humid tropics, very close to the equator, the area is characterised by its hot and wet nature. The total annual rainfall ranges from a low of 2,173 mm to a high of 2,694 mm to give a four-year mean of 2,152 mm¹.

Landscape context

Mouila lot 3 site is part of a bigger investment plan by Olam International in the wider landscape; Lot 3 is located close to two other palm oil plantations currently being developed by Olam – Mouila Lot 1 and Mouila Lot 2 (see Figure 2). There are also several other different land-uses prevalent in this landscape, including: village settlements and associated small-scale subsistence agriculture and forestry concessions, as well as conservation areas. The Mouila Lot 3 concession is located ca. 50 km to the north-east of Moukalaba-Doudou National Park, and approximately 40-45 km south of from Waka National Park. Lot 3 does not overlap with any Ramsar Site or Intact Forest Landscape (IFL). However, the site does overlap with a CARPE landscape (see Figure 2).

Socio-economic context

Fourteen villages are located in and around the proposed concession with an estimated total population of 800 people (See Figure 3: Mouila Lot 3 Map showing location of main village and Mouila town.). Additionally the Provincial capital is less than 5 km to the north-east of the site; this large town has an estimated population of 23,000 inhabitants. The main ethnic groups in the area are *punu* and *vungu*. The main economic activities in the area are small-scale subsistence cultivation of food crops, hunting, fishing and gathering of non-timber forest products (NTFP) and artisanal logging. Local communities rely on the dense network of streams and rivers for much of their water consumption, including drinking water.

The site, given its proximity to the town, villages and main road area is influenced by various human activities including hunting and fishing, small-scale timber extraction, and a recent road-building project. With the exception of Olam Palm Gabon's investments in the area there are no other significant industrial or development projects in close proximity to Lot 3.

Regional and national context

An estimated 82% of Gabon's land cover, approximately 22 million ha, is forested (FAO 2012²). Gabon has one of the lowest deforestation rates in Africa, estimated at 0.12% per year (average between 1990 and 2000). The country's low deforestation rate is due mainly to its low population density; 1,384,000 people (approx. 5 people per km²) with over 40% living in the capital, Libreville. The economy is based on oil, timber, and manganese, giving Gabon one of the highest per capita incomes in Africa. However, income distribution is highly skewed and rural populations are typically amongst the poorest in Gabon. Gabon has very little large-scale plantation agriculture, although this is changing due to the government's plans for economic growth and diversification away from the oil sector. Palm

¹ Paramanathan a/I Selliah. 2014. Preliminary soil assessment of Mouila 3 estate

² <http://www.fao.org/countryprofiles/index/en/?iso3=GAB>

oil production is one of the potential engines of development according to the national development strategy.

Compared to neighbouring countries, human threats to fauna and flora in Gabon are low. Deforestation is minimal (see above) and the very low rural population densities mean that apes, elephants and other high profile conservation species are widespread, with large populations in more remote areas, but small numbers still found even in the vicinity of large towns. Gabon is notable for its large forest elephant population, which is estimated to be around 50% of the global population. However, there are significant concerns about the growing threats to biodiversity from mining, logging, agriculture and increasing commercial hunting pressures, including ivory poaching. Eighteen mammal species and over 130 plant species in Gabon are categorised as threatened in the IUCN Red List assessment (CR, EN, VU categories). Gabon launched a national protected area system in 1946 with the establishment of the Lope-Okanda Reserve, thus setting the stage for the creation of a network of protected areas. In 2012, 12 new terrestrial National Parks covering nearly 2.9 million ha (about 11% of the national territory) were gazetted as protected areas.

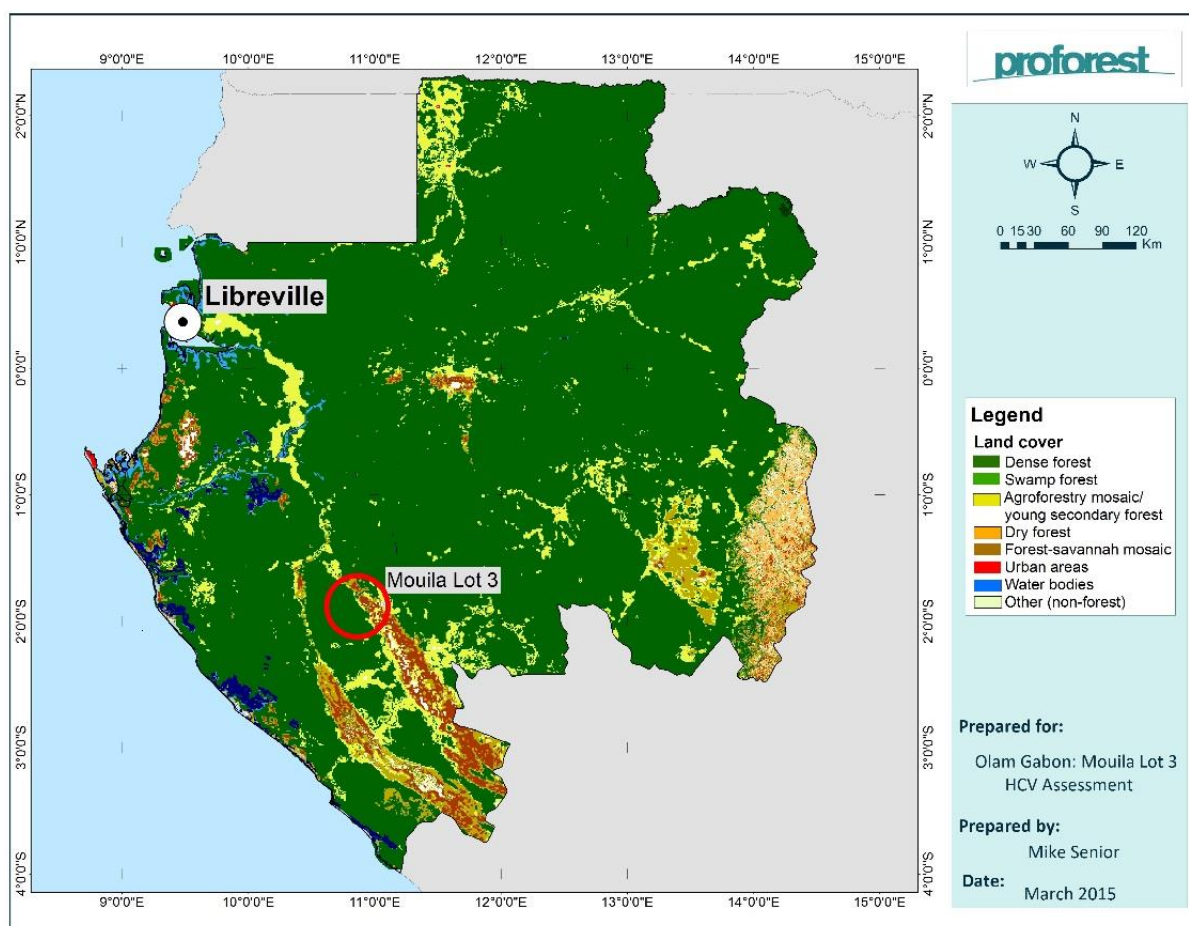


Figure 1: Location map for Mouila Lot 3.

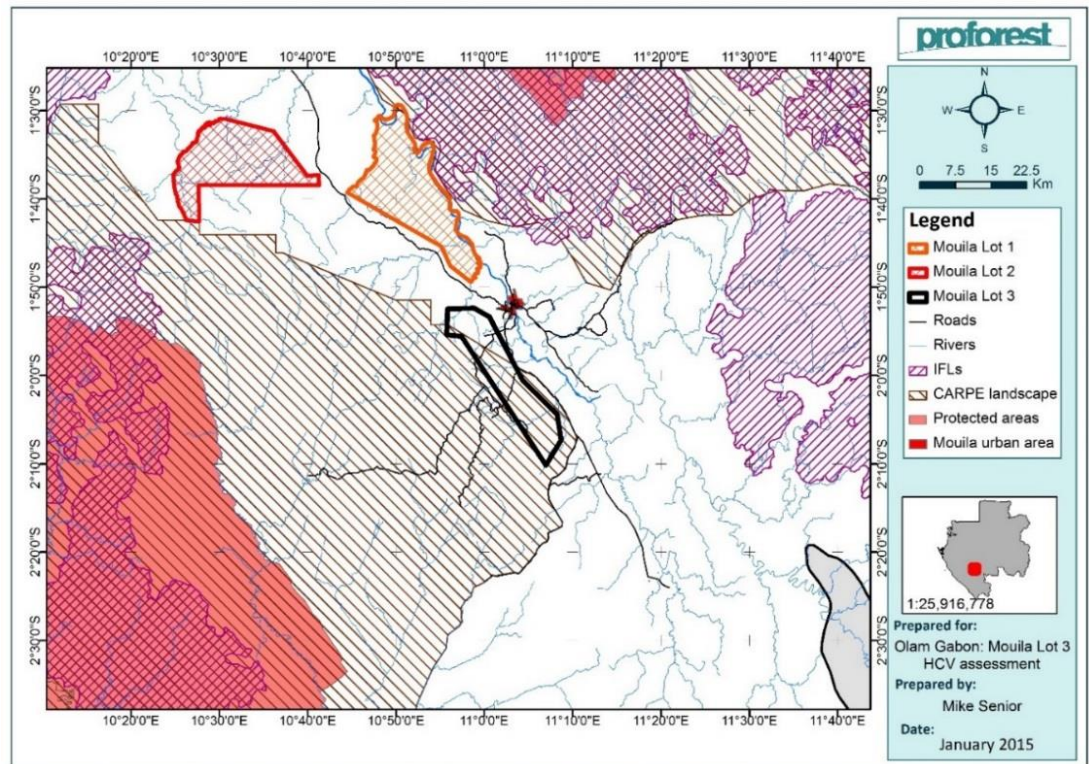


Figure 2: Landscape map showing Mouila Lot 3 in relation to Lots 1 and 2 as well as conservation designations in the wider landscape.

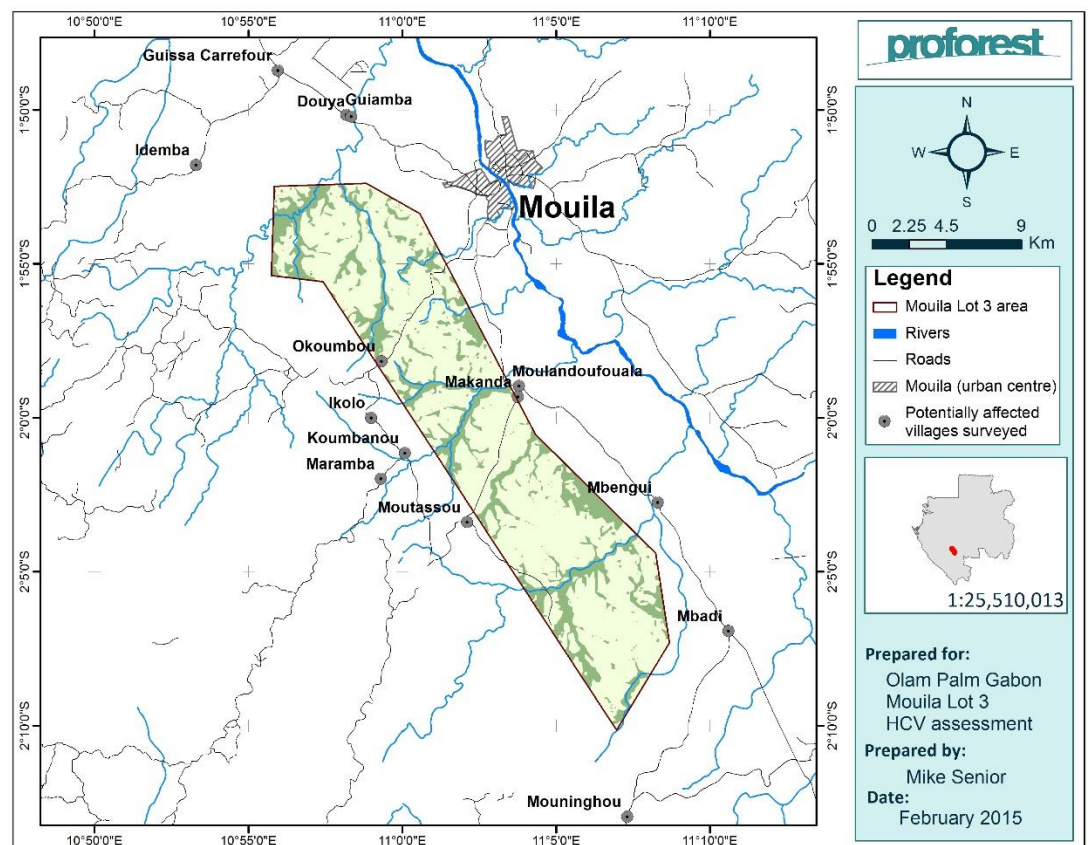


Figure 3: Mouila Lot 3 Map showing location of main village and Mouila town.

2 Methods

Assessment team

The Assessment team (see Table 1) comprised the Proforest core HCV team; the ESIA consultants; and a series of five technical expert teams for fauna, flora, soils, hydrology & water, and socio-economics and participatory mapping.

Table 1: Assessment team composition

Name	ALS Licence	Organisation	Role	Qualification
David Hoyle david@proforest.net	ALS15008DH	Proforest	Lead Assessor	<i>MSc Resource Mgt.; BSc Geography.</i>
Dr Audrey Versteegen	ALS15032AV	Proforest	Principal Assessor	<i>PhD Carbon Sequestration; MSc Land Reclamation & Restoration; MSc Biochemistry.</i>
Dr Mike Senior		Proforest	Discipline specialist	<i>PhD Tropical Forest Ecology; BA (Oxon) Hons. Biological Sciences.</i>

Name	Qualification	Expertise
Terea Consulting team: Environmental and Social Impact Assessment		
1. Aubin MBOUMBA; 2. Gustave NGUEMA; 3. Jean-Charles MONTAUFIER; 4. Charlemagne MOUANDJOURI; 5. Sarah TOINT;	1. Degree in Environment and Sustainable Development 2. Pharmaceutical Chemist 3. Engineer Hydrology and Hydrogeology 4. Degree in African Anthropology 5. Bioengineer in Environmental Management and Land-use Planning.	1. ESIA facilitation 2. Chemical analysis 3. Hydrology 4. Socio-economics 5. Sustainable forest mgt, Biodiversity
Water studies, under the supervision of Dr Jean-Daniel MBEGA		
Dr Jean-Daniel MBEGA <i>Agronomy & Forestry Research Institute (IRAF) at CENAREST (National Scientific & Technological Research Centre)</i>	PhD Biological Sciences	Hydrology
Blaise MBOYE <i>IRAF at CENAREST</i>	Engineer Ecology & Biodiversity Mgt Masters Fisheries Management	Fish and aquatic macro-invertebrates
Joseph NDONG NLO <i>l'Ecole Nationale Supérieure de Libreville</i>	Masters Chemical Engineering and Industrial Use; DEA Structure & dynamics of reactive systems	Environmental (aquatic) chemistry

Soil study		
Dr. Paramananthan a/l Selliah <i>PARAM Agricultural Soil Surveys, Malaysia</i>	PhD Soil Science	Pedology
Botanical and faunal studies under the supervision of Dr Alfred NGOMANDA		
Dr. Alfred NGOMANDA <i>Tropical Ecology Research Institute (IRET)</i>	PhD. Evolutionary Biology and Ecology	Wildlife biology and botany
Dr. Nestor ENGONE OBIANG <i>IRET and National Herbarium</i>	PhD. Biology and Ecology	Botany
Socio-economic survey		
Prof. J.E. ETOUGHE EFE <i>IRET at CENAREST</i>	PhD Sociology	Socio- economic research specialist
Edwige EYANG EFFA <i>IRET at CENAREST</i>	DESS GIS Masters in African Languages	Participatory mapping specialist; GIS expert;

Timeframe

This Assessment was carried out between July 2014 and March 2015 as in Table 2 below.

Table 2: Timetable of activities.

Activities		2014					2015			
		J	A	S	O	N	D	J	F	M
Pre-assessment	Information exchange									
	Initial field scoping visit by Dept. of Environment (DGE), ESIA team, Proforest & consultants									
	Preparation and planning, including development of methods and sampling protocols									
Assessment (field studies, consultations, HCV identification, sharing of results)	Participatory mapping and socioeconomic survey									
	Biological field data collection – full assessment									
	Validation of the participatory maps									
	Public consultation in Mouila									
Preliminary conclusions, concerns, and recommendations	Expert workshop									
	NGO and expert stakeholder consultations									
Reporting & Peer review	Peer review									
	HCV reporting, peer review & submission									

HCV assessment phase - baseline survey methodologies

In order to inform HCV identification and interpretation for Mouila Lot 3, the following field baseline surveys were carried out:

- Flora – forest and savannah inventories;
- Fauna – terrestrial mammals, fish and macro-invertebrates;
- Soils;
- Hydrology; water and soil chemical analysis, and
- Socio-economics and participatory mapping.

The **flora inventory** was split into two parts: forest areas and savannahs. In the **forests**, the botanical team sampled 21 (250 m x 20 m) randomly selected 0.5 ha plots located within the forest strata across the planned development area, covering 0.18% (10.5 ha) of the total estimated area of forest habitat within the site. For each plot the team described the general habitat characteristics, and then recorded the species and the diameter at breast height (DBH) of every tree over 10 cm in diameter.

The botanical team used a phytosociological approach to study the **savannah** plant communities and species composition in a sampling of 100 (5 m x 5 m) 0.25 ha plots, located in 5 different savannah areas inside Lot 3. The team recorded all the species identified in the plot, as well as the relative abundance of each species in the site, using the phytosociological method. Informed by national experts who have raised concerns that some rare or endemic species of flowers could be found in savannah areas, the survey team was instructed to keep samples of unknown species for identification at the National Herbarium of Gabon.

The **faunal (mammal) inventory** was focused on the forest zone and adopted two methodologies:

Recce-transects: A four-person wildlife inventory team carried out 7 recce-transects located in a systematic manner inside the major forest zones in the concession and recording all direct and indirect observations. The inventory focused primarily on large mammals but other taxonomic groups were also recorded.

Camera traps: Thirty-eight cameras were placed every 200 m along either 1 or 2 km transects, making a total of 8 km sampled with camera traps. The cameras were left for an average of 37.7 days, making a total of 1,432.6 camera-days of effort.

The faunal diversity was further assessed by sampling the **fish and macro-invertebrate** populations in the 5 water catchments overlapping the concession area. Fish samples were collected in 13 locations using nets of different mesh sizes. 765 samples were collected for identification and analysis. Aquatic macro-invertebrates were sampled in 14 stations using a *surber* net and identified in the laboratory. The results were analysed in order to calculate biodiversity indices and the ecological quality of the watercourses. 1103 macro-invertebrate samples were collected across the stations.

A comprehensive **soil survey** was conducted by a Malaysian soil expert. A system of free traversing was employed for the survey. A sampling intensity of one examination point for every fifty to hundred hectares was maintained.

Hydrology and water quality: Samples and measures were taken during two field missions to gather data on size, depth, water velocity and flows, biochemical and ecological quality of the main rivers in the site - Douya, Idigui, Dibotsa, Ivevoula and Doumina. Water was

sampled in 14 locations and analysed for pH, oxygen, salinity and for heavy metal contamination.

A socioeconomic study was carried out for 14 villages and 2 quarters of Mouila town (see Table 3) which were assessed as potentially being impacted by OPG operations. A combination of group discussions at the village/quarter level and semi-structured questionnaires at the household level was used in a qualitative study of resource use.

Participatory mapping was carried out in the same 14 villages and 2 quarters of Mouila town to identify and map sites and resources of cultural or economic significance to the local population. The mapping was conducted in two stages with designated members of each village. First, discussions were held and sketch maps produced. On the basis of this preliminary phase, an exercise of GPS field mapping was organised – where the social mapping team and representatives of the local communities walked along paths and throughout customary use areas to identify and map sites of importance, such as hunting or fishing grounds, sacred sites, NTFP, etc. The digitally-produced maps were validated by the local communities before being shown to a wider group of villages and to local authorities for a final validation.

Table 3: List of villages potentially impacted by the development of an oil palm plantation in Lot 3 and corresponding socio-economic studies carried out.

	Village or Town quarter	Estimated population size (no of households) ³	Discussions & interviews*	Participatory mapping completed and validated*
1	Moutassou	12 (6)	Yes	Yes
2	Ikolo	15 (6)	Yes	Yes
3	Mouninghou	59 (18)	Yes	Completed, but not yet validated
4	Koumbanou	30 (11)	Yes	Yes
5	Maramba	2 (1)	Yes	Yes
6	Makanda	12 (6)	Yes	Yes
7	Okoumbou	25 (11)	Yes	Yes
8	Moulandoufouala	12 (6)	Yes	Yes
9	Mbengui	14 (11)	Yes	Yes
10	Douya	90 (30)	Yes	Yes
11	Guiamba	50 (20)	Yes	Yes
12	Guisa Carrefour	55 (21)	Yes	Yes
13	Idemba	250 (102)	Yes	Yes
14	Mbadi	40 (20)	In progress	Completed but not yet validated
15	Bavanga quarter	n.a	Yes	Yes
16	Bangui-Baléka quarter	n.a	Yes	Yes

* At the time of completing the HCV findings and conclusions (February 2015)

³ Etoughe EFFE Socio-economic Survey of Mouila Lot 3 for OPG (2015)

HCV 1. **PRESENT**

3 Findings and Results

3.1 HCV 1 Species Diversity

Vegetation

About 75% of Mouila Lot 3 is savannah, cut by narrow gallery forests running along a relatively dense network of permanent and seasonal rivers and streams, which make up the remaining 25% of the vegetation. Three types of botanical composition could be identified using multivariate analysis on the savannah sampling results, corresponding to plots located on dry land with richer or poorer soils, and waterlogged areas. The savannahs in Lot 3 are dominated by *Hyparrhenia* spp., and their botanical composition is typical of the grasslands of south-western Gabon. They are typically maintained against forest recolonisation through systematic annual burnings set by local communities. Overall 59 herbaceous species were identified, all of which considered common or widespread, none endemic or of particular conservation significance in the Gabonese context or listed on the IUCN Red List. From a species diversity perspective, the savannahs were thus not found to be remarkable by comparison with grasslands in the region, and consequently were not considered HCV 1.

The size of the gallery forests are generally in proportion with the width of the watercourses they follow. A total of 2,927 individual trees (dbh ≥ 10 cm) were recorded during the forest survey, representing 183 species in 44 families. The species composition was dominated by Okoumé and species of the *Cesalpiniaceae* and *Olacaceae* families, which is typical of disturbed forests of southern and Coastal Gabon. This was corroborated by the forest structure, characterised by trees under 25 metres in height, a canopy cover rarely exceeding 60%, and a dense undergrowth. This level of forest degradation is likely a result of activities such as timber extraction and shifting agriculture carried out by local communities.

Six species observed in the site are listed on the IUCN Red List (VU), five of which showed very low IVIE⁴s and are therefore not considered ecologically important. With an IVIE $>10^5$, only *Aucoumea klaineana* (Okoumé) is considered a dominant species in Lot 3. However, while Okoumé is near-endemic to Gabon, as a dominant species of the coastal plain forests, it is extremely widespread and common within its range and is widely used as a commercial species. Furthermore, with the exception of the terra firma forest block of Mbengui, most Okoumé trees across the concession had a dbh under 30 cm.

The same forest block counted two species endemic to the wider region (*Daniellia klainei* and *Neochevaleriodendron stephanii*), however these weren't represented in a concentration that would justify an HCV 1: from a purely botanical point of view it is considered that Mouila Lot 3 does not warrant an HCV 1 classification.

Fauna – mammals

Density data was not derived from the fauna survey results, which were used to discuss species presence or absence and their relative abundance. The sampling plan was designed to prioritise the gallery forests, and species encounter rates are thus unavoidably biased towards forests.

⁴ IVIE = (L'indice de valeur d'importance des espèces) Index of species importance

⁵ Reistma JM, 1988. Forest vegetation in Gabon. Tropenbos technical series 1, 142 p.

Along the 38 km of recce-transects, 12 species of mammals have been identified, including flagship species protected in Gabon such as elephants, buffalos, sitatungas and chimpanzees. The faunal assemblage in the area is typical of southern Gabon, although the encounter rates seem to indicate populations are reduced, probably due to significant hunting pressure. The results from the camera trap survey corroborated these findings: over a campaign of nearly 38 days, cameras operated at a rate of approximately 120 photos / 1000 camera-days, a low rate for the region. The camera traps identified 14 mammal species, 6 of which had not been identified from the recce-transects (making a total species list of 18 mammals in Lot 3).

Despite its location in a highly anthropogenic area, Lot 3 is used by several species of conservation importance, albeit in reduced numbers. The presence of elephants was recorded in the north and the south of the proposed area, avoiding Mbiendi ranch. Buffalo signs could be found throughout the concession, together with antelopes such as sitatungas and duiker species, even though these species are present in notably small numbers, corroborating the presence of subsistence hunting.

Most elephant and buffalo signs recorded were relatively old, indicating that most parts of the site are likely used only seasonally. This was confirmed by the camera trap survey, carried out over the short rainy season, which returned a relatively low number of photos of either species. Fresh signs of both were recorded in the terra firma forest block of Mbengui possibly suggesting permanent residence, however not in relative abundance rates sufficient to indicate remarkable population sizes or concentrations that would justify assessing these species as HCV 1.

Two chimpanzee nesting sites were found in the same terra firma forest, counting between 7 and 9 nests each. Chimpanzees are integrally protected by law in Gabon, and listed on the IUCN Red List (EN). While they are not uncommon in Gabonese forests, and despite the relatively small size of this particular group, the territorial nature of chimpanzees adds to the conservation importance of the dry forest of Mbengui.

Indeed, while the species assemblage found in the block of Mbengui is quite typical of the region, and despite their presence in numbers lower than normally required for HCV 1, the combination of this diversity (faunal and botanical) and a contrasting highly anthropogenic surrounding landscape gives this forest block a special conservation importance. It should be subject to specific management interventions, including ensuring westward connectivity to the Tandou Mountain forest block. After discussion with conservation experts, and following the precautionary principle to ensure appropriate management, the Mbengui forest area is thus designated as HCV 1.

Aquatic biodiversity

The relatively dense hydrological network is characterised by a high number of seasonal streams, and extremely variable water table levels and flooding events during the rainy seasons.

The ichthyology team collected a total of 35 species across the site, grouped into 14 families. Given the intensity of effort and the relative homogeneity of habitats in Lot 3, this is considered a high count of species, especially in the context of Gabon where fish biodiversity is poorly known, and further sampling at different times of year would likely record additional species. Two species of specific conservation interest were identified, both endemic to specific sub-basins of the River Ogooué and one listed on the IUCN Red List (EN). Both species were recorded at the same sampling station to the north of the area, which was also characterised as more biodiverse than other rivers in Lot 3. While

only one specimen of each was captured during the survey, and a “concentration of species” could not be identified, following a precautionary approach on the basis of the arguments above, we consider the presence of HCV 1 is justified in the River Douya. While this survey showed no evidence of these species in other watercourses, the rivers of the Ngounié basin are generally known to be particularly biodiverse, and a precautionary approach should be adopted with respect to the possible presence of endemic fish species in other sub-catchments in Lot 3.

Figure 4 shows the location of HCV 1 and their proposed management area, which will require appropriate management.



HCV 2. ABSENT

3.2 HCV 2 Landscapes level ecosystems and mosaics

Lot 3 is located in the same landscape as Lot 1 and Lot 2, which will add considerations of a cumulative landscape fragmentation effect in the area.

The surrounding landscape is heavily influenced by human activities in general, and there is evidence of small-scale logging by local communities within and around Lot 3, as well as signs of a heavy hunting pressure. These factors are likely affecting natural patterns of abundance of many faunal species, which have been found at relative abundance rates much lower than would be expected in an undisturbed Gabonese landscape.

However there are also several areas designated as being of conservation importance in the landscape, including a CARPE area. Mouila lot 3 is ca. 40-45 km from the nearest National park and ca. 20 km away from the nearest IFL, with ecological barrier likely preventing significant movements of fauna over these distances. The site does significantly overlap with the Gamba-Mayumba-Conkouati CARPE landscape, however considering that its focus is to protect particularly coastal habitats and biodiversity, and given that CARPE landscapes do allow for economic development, in consultation with CARPE implementing partners this assessment concluded that Mouila Lot 3 would not pose a direct threat to this conservation objectives of the Gamba-Mayumba-Conkouati complex. Mouila lot 3 does not play a vital supporting role to any protected area or key biodiversity area in the region, and thus does not fall under HCV 2 classification.



HCV 3. ABSENT

3.3 HCV 3 Ecosystems and habitats

The three main categories of ecosystems identified within Lot 3 include in order of importance (surface area):

- Savannahs, maintained by man-made fire;
- Seasonally flooded gallery forests, and
- Blocks of terra firma forests.

The baseline surveys did not gather any evidence that the savannahs are particularly remarkable in the Gabonese context from either a botanical or faunal point of view (See section 3.1 of the present summary). The savannahs are typically maintained through human-induced seasonal fires, and while traces of buffalo activity were found, there is no indication that savannahs in Lot 3 constitute a refuge of particular significance for local biodiversity in the landscape, and are thus not assessed as HCV 3.

It is worth highlighting however that while savannahs and forest-savannah mosaics are well represented across large areas of southern Gabon, the Republic of Congo, and the Democratic Republic of Congo, they are not currently adequately represented in the

protected area network of Gabon. Because savannahs of southern Gabon are not considered to show characteristics of remarkable biodiversity importance and they have historically not been subject to high levels of threat or disturbance, they have not been prioritised for conservation. It is thus laudable that Olam have focused on savannah areas for plantation development rather than areas of high carbon forests in their bid to minimise deforestation caused by their operations. However attention needs to be drawn to the fact that some areas of Gabonese savannahs not only support a range of important species, but also contain rare or threatened herbaceous species often hard to identify because little known or very seasonal. They are in parallel now becoming more fragmented, and the risks of systematic conversion should not be undervalued. This should be an important consideration in future site selection for Olam.

All the major forest areas found within Lot 3 run along watercourses in relatively narrow galleries. Their vegetation and structure is typical of degraded forests, which is coherent with the seasonal burning of the savannahs and the constant state of recolonization of the forest edges. They are dominated by *Okoumé* and common or well-distributed species of the *Cesalpiniaceae* and *Olacaceae* families: this composition is widespread in the forests of southern and Coastal Gabon and the Ngounié region, and does not indicate that these forests are exceptional in the landscape context (See section 3.1 of the present summary). The gallery forests of Lot 3 are consequently not assessed as HCV 3.

Outside of gallery forests small blocks of terra firma forests can be found across the proposed concession. Consistently with the annual burnings mentioned above, these are generally degraded, and also include a number of mango trees, indicating the location of old villages. Due to their generally small size (ca. <20 ha), these blocks are also unlikely to offer particularly important refuge to the fauna present in the area, and they are not classified as HCV 3. A richer botanical diversity was however found in the bigger forest block located near the village of Mbengui, where long-lived, light-demanding species were found in higher numbers and indicate older, less disturbed maturing secondary forests. As discussed in previous sections (see section 3.1 of the present document), a higher density of animals was also noted in this forest, including flagship and protected species such as elephants, buffalos, sitatungas and chimpanzees. This could indicate that the forest block of Mbengui serves as a refuge for a number of species in a zone of high hunting pressure. While this is not enough in the Gabonese context to classify the forest block as HCV 3, it highlights the importance of the zone for biodiversity conservation, and for the need of specific management measures to be taken in the development of the site.

HCV 4. **PRESENT**

3.4 HCV 4 Ecosystem services

Water Quality

The proposed area of Mouila Lot 3 spans 5 sub-catchments, and presents a relatively dense hydrological network of both permanent and seasonal rivers and streams, characteristic of its location at the foothills of the Tandou Mountain range, in the plain draining into the major River Ngounié. Any degradation of rivers crossing the site would impact aquatic biodiversity, and would in turn potentially change the quality of the Ngounié waters, with potentially serious consequences on the ecology of the Ngounié plain downstream. Additionally, the numerous villages located in the plain, as well as the town of Mouila, are all directly downstream from Lot 3, and all local populations have confirmed during the socio-economic survey and participatory mapping that rivers and streams are crucial for both drinking water as well as subsistence fishing.

Ecosystem services are considered of *critical* importance when their loss would result in serious suffering for local communities concerned, and/or there isn't an obvious or reliable alternative to the services. The three principle sources of water in the villages potentially impacted are 1) water pumps, 2) rivers, 3) rain water. 50% of the villages have a single water pump for the whole village and several of the water pumps are in a state of disrepair. Therefore the reliance of these villages on river water is considerable. For these services the rivers and streams located in Lot 3 are consequently assessed as HCV 4 and will have to be adequately managed to ensure their biological and physicochemical quality is preserved. The results of the analyses carried out as part of this assessment should be considered a baseline for water quality control: the aquafauna study found 90% of the aquatic biodiversity (macro-invertebrates) identified in the area to be sensitive to pollution, indicating waters of good quality that should be adequately protected.

Forest galleries

The riparian zones play an important protective role for the rivers, and control water quality by filtering out potential pollutants, but also slowing down floodwaters, thereby controlling the erosion of river banks and potential downstream flooding. The role played by gallery forests is thus integral to the functions and services provided by the rivers and streams they follow: in terms of ecosystems services the rivers and adjacent forests can be considered a single ecosystem unit. These gallery forests are narrow, in most cases less than 500m in width, and their degradation or conversion would have similarly dire consequences on local communities and the ecological integrity of watercourses located downstream of the site. Furthermore, given the poor soil fertility in the proposed concession area (lateritic soils) and the consequent potentially higher fertiliser inputs necessary for successful development of an oil palm plantation, it is critically important that these riparian zones are maintained intact in their entirety. All gallery forests in Mouila Lot 3 are considered HCV 4 (see Figure 5).

Soil erosion control

With the exception of river banks, the general topography of the site is flat, or slightly undulating in areas very restricted in size. The soil survey shows that there are no slopes over 10 degrees, and soil erosion control is not considered a significant or critical function of the vegetation cover.



HCV 5. PRESENT

3.5 HCV 5 Community needs:

For the local communities living in and around the proposed Mouila Lot 3 site, the main livelihood strategy is based on small-scale subsistence farming, fishing, hunting and the collection of local non-timber forest products (NTFPs).

Farming

With a cash economy limited by poor access to markets, most households either produce or collect from surrounding areas most of their basic food items. On rare occasions, surpluses can be sold when transportation to markets is available – this is very infrequent and unreliable, and limits the local economy to mostly subsistence activities. The limited agricultural activities are generally practiced in cleared forest plots rather than on nutrient poor savannah soils. The scale of subsistence agriculture is kept low by the relatively high average age of the population. In this context food crops are considered a critical basic need of local communities.

Hunting, Fishing and Gathering

In all the villages in or around the proposed concession area, fish is an important source of protein and fishing is widespread in all the local rivers and streams. In a similar way all the villages reported that community members hunt a range of animals in the surrounding forest areas. As for agriculture, all hunting and fishing is carried out to provide subsistence to village members and only a small proportion of the catch appears to be sold externally.

Local communities gather a wide number of NTFPs from the gallery forests inside the concession area, including nuts, fruits, leaves, and mushrooms for home consumption, as well as firewood, medicinal plants and building materials.

It should be noted that villager's farming, fishing and hunting activities normally supplement the provision of staple foods (including rice, oil and tinned goods) by family members and relatives working in Mouila, and locally sourced foods can be considered as a necessary insurance against shortages in such supplies rather than the basis of the local diet. The level of poverty in the villages surrounding Lot 3 being notable compared to villages on the main Mouila-Fougamou axis, a reduction in the food supply from either source could create significant hardship especially for the elderly or infirm residents. As a result, fishing, hunting and gathering of NTFPs are all considered critical to local communities' livelihoods.

Water resources

All the villages rely on either water pumps, rivers or rainwater for all their water needs including drinking and cooking. Most of the villages only have a single water pump which does on occasion break down and remains unrepaired for extended periods. The rivers and streams crossing Lot 3 are thus crucial to fulfil the water requirements of a number of villages and the town of Mouila located downstream. These are consequently also assessed as a critical need, and planned operations will have to take adequate precautions not to alter the amount of water available to local communities reliant on this resource.

The participatory mapping exercise conducted in the villages in and around the proposed site produced community resource maps showing complete zones used by local communities around their villages (360° surveys). These maps show that some communities will be more or less impacted by planned operations, based on the actual extent of their activities within Lot 3, and taking into consideration that, with the exception of the quarter of Baléka, the villages surveyed carry out a substantial proportion of their activities outside the concession area, and thus have potential alternatives. It is therefore possible that not all the community use zones overlapping with Lot 3 are *fundamental* in satisfying basic necessities and should be assessed as HCV 5. However HCV 5 areas should be "identified through engagement with communities or indigenous people", consequently following a precautionary approach, all activities described above as basic needs which overlap with Lot 3 are assessed as HCV 5 pending further community consultation and negotiation through a thorough Free, Prior and Informed Consent (FPIC) process. The HCV 5 zones are shown in Figure 6.



HCV 6. PRESENT

3.6 HCV 6 Cultural values:

Sites of global or national significance: There are no UNESCO World Heritage Sites in the area⁶ (which are frequently used to identify HCV 6 sites of global importance) nor any other undesignated sites of global or national importance.

Local importance: There are several sacred sites and burial grounds located inside the proposed concession area (Figure 7) which are of HCV 6 value. These were identified through the participatory mapping exercise, and were presented and validated on the community maps. These sites consist of:

Cemeteries: both currently being used as well as abandoned ones. These are most often found in old abandoned village sites.

Sacred sites including forests, lakes and caves - all these sites are used for various traditions and rites, including initiations.

3.7 Stakeholder consultation

Stakeholder consultations were carried out at both the national and local level. The assessment team carried out three sets of consultations with important stakeholders at the national level at key milestones along the assessment process:

1. **July 2014 consultations:** This was an introductory session to inform the stakeholders of the project, as well as the HCV and ESIA processes that were planned. Stakeholders were asked to raise any initial concerns regarding the project, site location or the planned process. Consultations were conducted with WWF, WCS, Brainforest and ANPN by the Lead Assessor.
2. **December 2014 Consultations:** This session was aimed at requesting from the key stakeholders any conservation and or social concerns that they have regarding the development of the Mouila Lot 3 site. These were conducted with WWF, WCS, Brainforest and ANPN.
3. **February 2015 Consultations:** The third consultation session included a presentation⁷ of the assessment teams' preliminary findings and recommendations. Stakeholders were given the opportunity to comment on the assessment and give their inputs. The minutes of these meetings held with WWF, WCS, IUCN, and Brainforest are included in the full assessment report.

In addition to the socio-economic survey and participatory mapping exercises, the Assessment team also conducted public consultations in all potentially affected villages at the site level in February 2015. Both the ESIA and the HCV main findings were presented across a series of meetings in Mouila and in the site in the presence of the Administration and representatives of the local communities. The summary report of these public consultation meetings has been documented and included in the Annexes of the full assessment report.

Although there were no major concerns or objections, the stakeholder comments and feedback have been taken into account in the preparation of the HCV assessment report.

⁶ There is only one UNESCO WHS in Gabon – Lope-Okanda landscape – found in Ogooue-Lolo and Ogooue-Ivindo Provinces. <http://whc.unesco.org/en/list/1147>

⁷ 60 slide presentation showing all the preliminary HCVs (1-6) identified and recommendations.

Table 4: HCV identification conclusions.

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			
2	Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance			
3	Rare, threatened, or endangered ecosystems, habitats or refugia			
4	Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes			
5	Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples...			
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...			

Figure 8 shows the combined HCV map with all the identified HCVs and their management areas.

3.8 HCV Maps

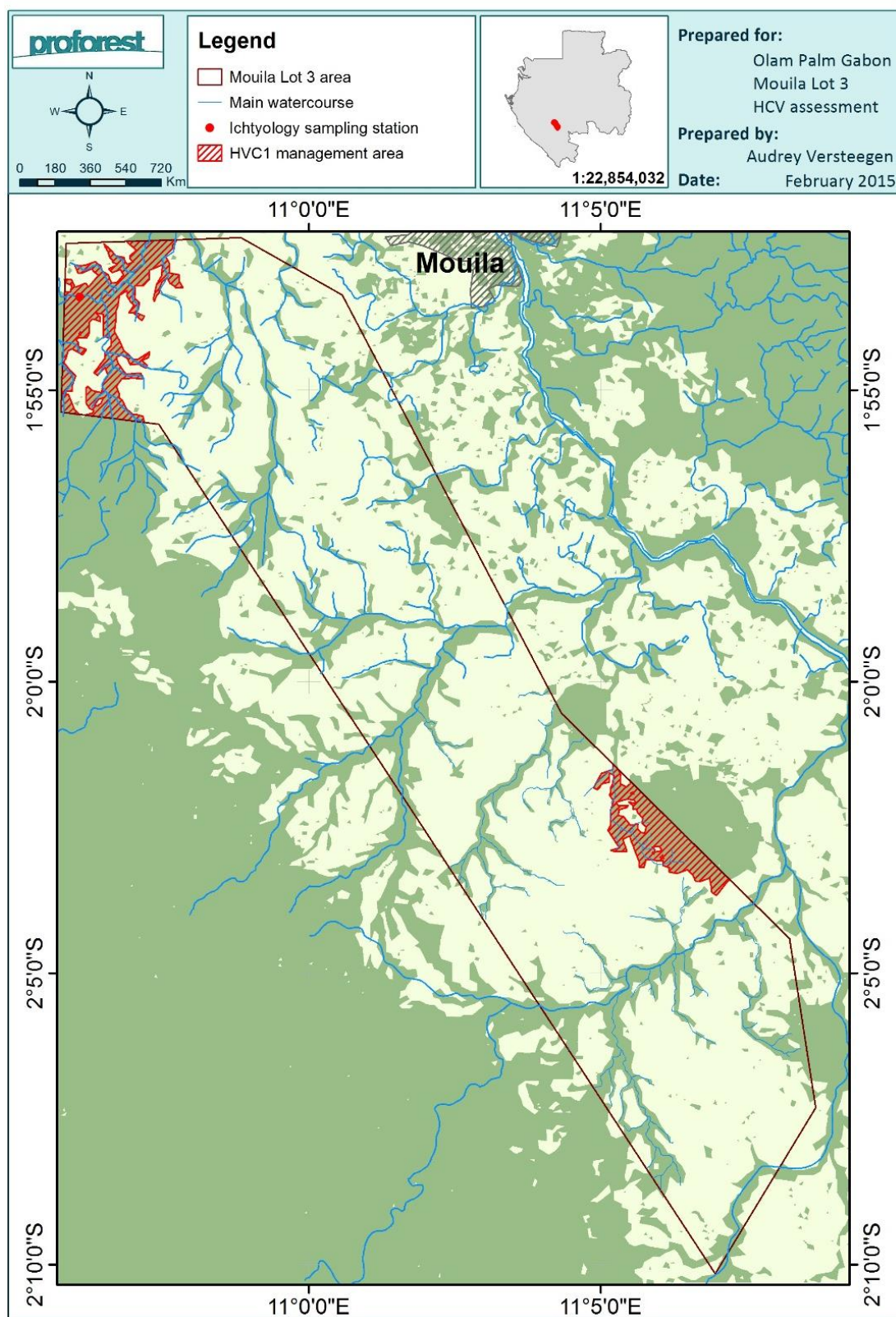


Figure 4: Location of HCV 1 and their proposed management areas in Mouila Lot 3.

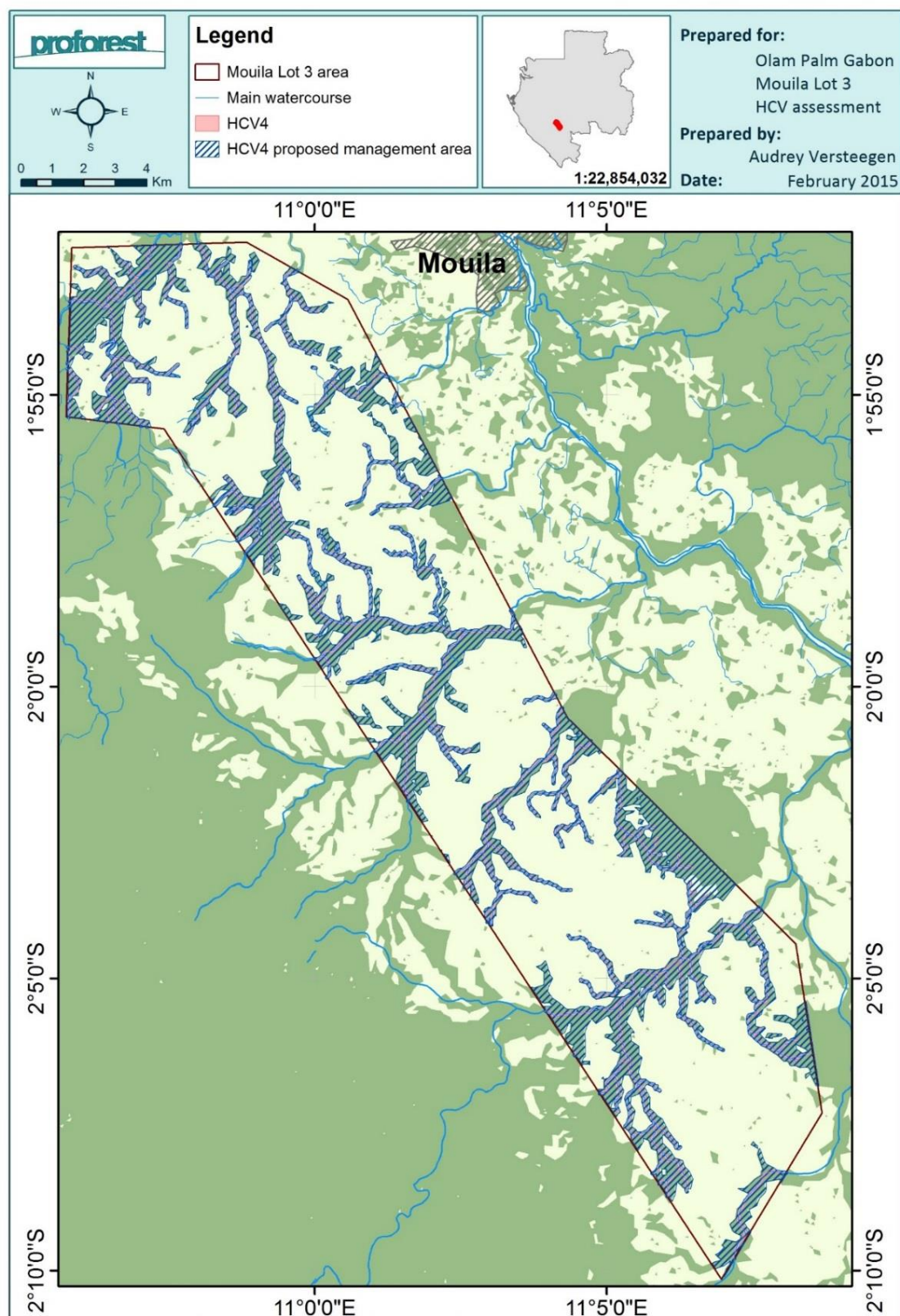


Figure 5: Location of HCV 4 and their proposed management areas in Mouila Lot 3.

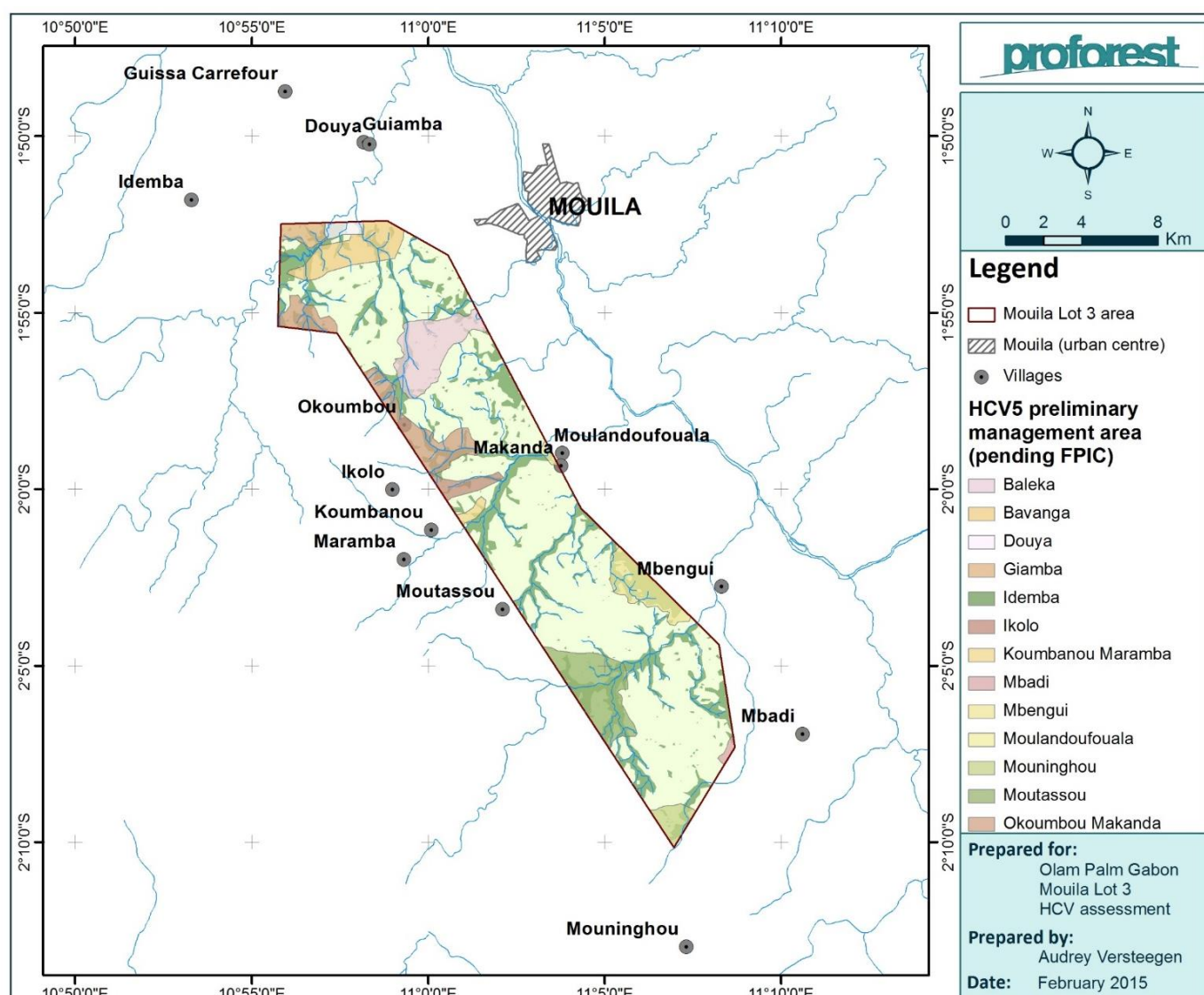


Figure 6: Location of HCV 5 preliminary management areas in Mouila Lot 3, pending completion of FPIC processes.

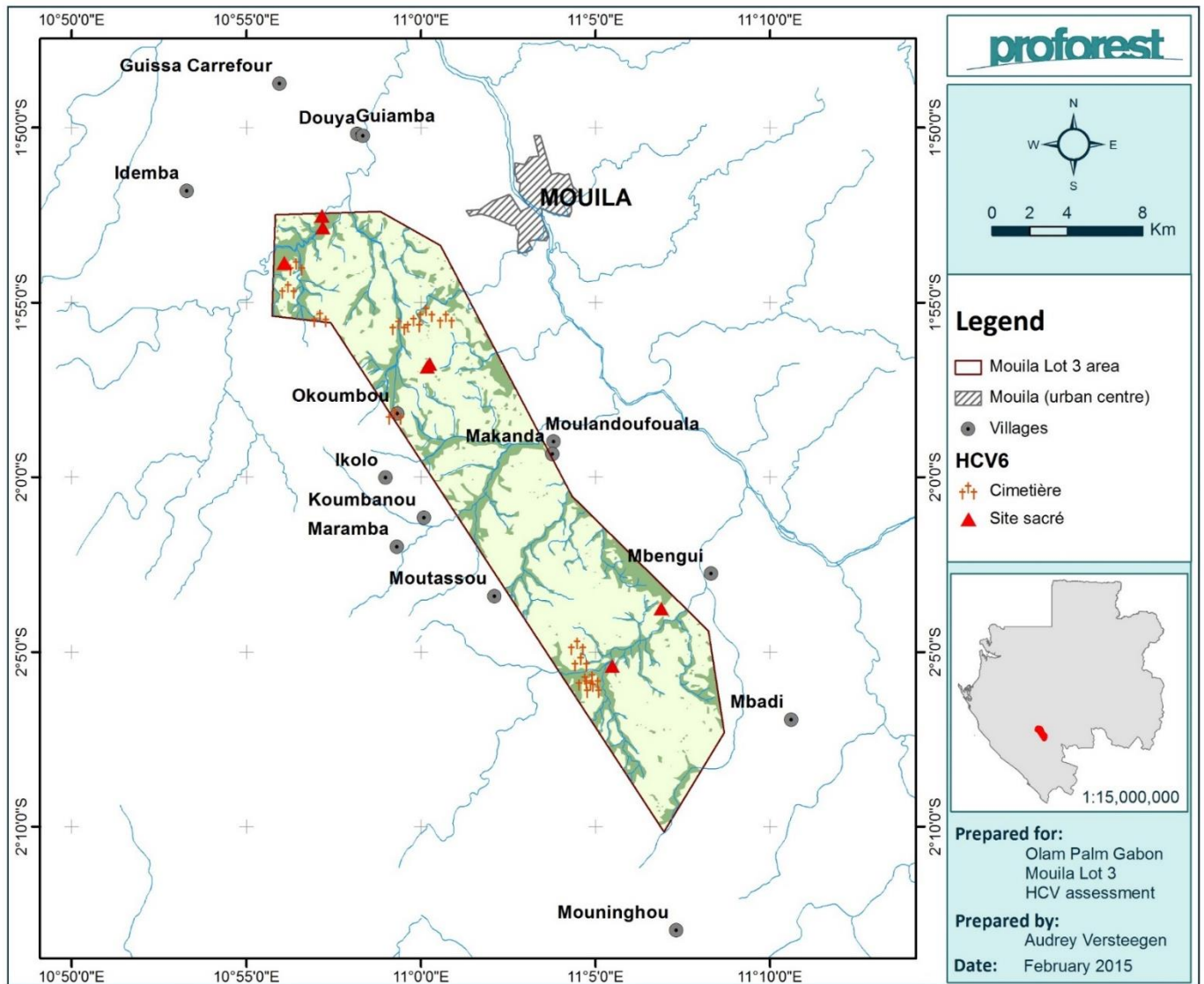


Figure 7: Location of HCV 6 in Mouila Lot 3.

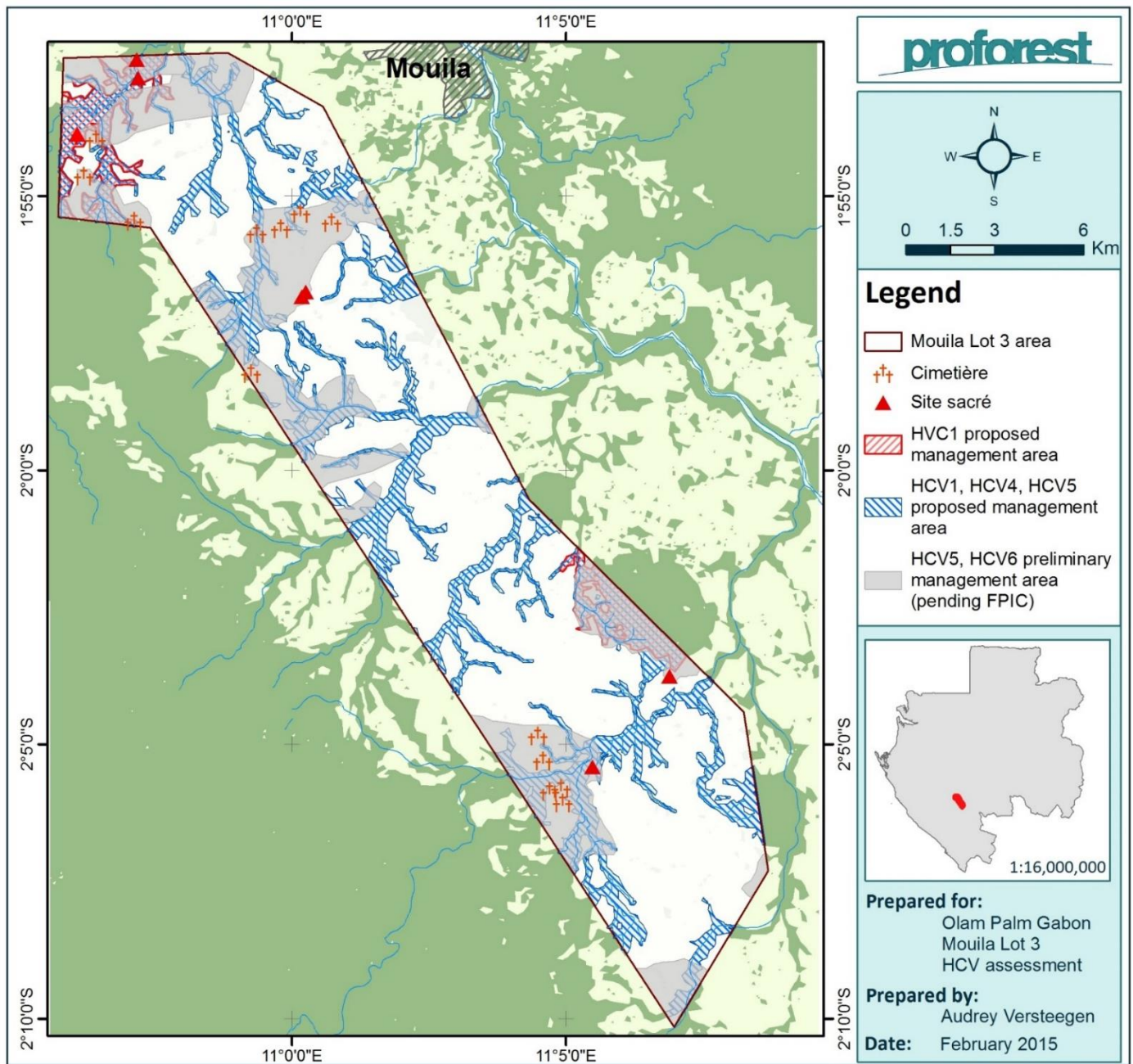


Figure 8: Location of all High Conservation Values (HCVs 1, 4, 5, 6) identified in Mouila Lot 3 and their proposed management areas.

4 HCV Management and monitoring

HCV	Brief description of value present	Main threats
1	<p>Species diversity</p> <ul style="list-style-type: none"> Two endemic species of fish, including one listed as Endangered by the IUCN, in the River Douya Mbengui terra firma forest with species assemblages 	<p>Current</p> <ul style="list-style-type: none"> Overfishing by the nearby communities of Bevanga, Douya, Giamba and Idemba; Logging and hunting <p>Potential</p> <ul style="list-style-type: none"> Loss of water quality due to nutrient leaching / fertiliser runoff or other pollution, sedimentation caused by river crossings Loss of forest (should it be cleared) Increased hunting pressure.
4	<p>Basic ecosystem services</p> <ul style="list-style-type: none"> Hydrological functions to maintain water quality and quantity for communities and fisheries, as well as prevent flooding. 	<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 <p>Potential</p> <ul style="list-style-type: none"> Widespread loss of riparian forest due to land clearance for palm oil plantation (high level threat) Loss of water quality and quantity due to loss of forest cover and service provision (erosion and flood control) Loss of potable water supply downstream Flooding Water pollution due to fertiliser and pesticide use
5	<p>Basic Community Needs</p> <ul style="list-style-type: none"> Provision of food from farming, hunting, fishing and NTFP gathering in the forest zone Water supply to communities 	<p>Current</p> <ul style="list-style-type: none"> Bushmeat supply is already dwindling as hunted species numbers appear to be in low numbers from overhunting <p>Potential</p> <ul style="list-style-type: none"> Loss of fertile forest land for farming if riparian areas are replaced by oil palm. Loss of access to traditional hunting, fishing and NTFP grounds Reduction of fish stocks and loss of fish habitat due to impacts on water quality and quantity Loss of potable water due to pollution.
6	<p>Cultural values</p> <ul style="list-style-type: none"> Burial grounds Sacred sites in forests (grove, cave...) Lakes 	<p>Current</p> <p>none</p> <p>Potential</p> <ul style="list-style-type: none"> Loss of access Damage to sites or resource from land clearance

HCV	Threats	Management recommendations	Monitoring recommendations
1	<ul style="list-style-type: none"> • Overfishing by the nearby communities of Bevanga, Douya, Giamba and Idemba; • Loss of water quality due to nutrient leaching / fertiliser runoff; • Clearing and hunting in Mbengui Forest block; 	<ul style="list-style-type: none"> • Two of these villages are openly against the project and accepted the participatory mapping exercise only to excise their customary land from the proposed permit. It is likely that such excision would result in some portions of the River Douya being excluded from OPG's permit. The FPIC process should keep the presence of an HCV in the area in mind in negotiating the zone. It is recommended that OPG carries out further sampling at different seasons to ascertain the presence of valuable fish biodiversity and inform the FPIC process. OPG should engage with local communities on the value present and develop a programme to mitigate the threat from overfishing. • The gallery forest around the River Douya should be integrally preserved as a buffer against potential runoff. • In consultation / negotiation with the local community, Mbengui forest block needs to be managed for its mammals and forest cover. A local agreement needs to be reached to restrict hunting pressure in this zone. 	<ul style="list-style-type: none"> • Regular water sampling following BACI approach (upstream, in site and downstream) to preserve water quality: water quality parameters should remain within an acceptable range (similar to baseline values for microbiology and physio-chemistry recorded prior to land development) to preserve the fish habitat. • Further studies and on-going monitoring of fisheries in all the main rivers to ensure that HCV 1 is maintained and enhanced. As well as to verify if further endemic or IUCN listed species are present in the other watercourses. • A regular monitoring system needs to be established to ensure that forest cover is maintained and hunting pressure is kept at a minimal level in Mbengui forest block
4	<ul style="list-style-type: none"> • Low level forest loss due to clearing for subsistence agriculture and small-scale logging/ timber extraction • Large scale forest loss due to land clearance for palm oil plantation (high level threat) • Loss of water quality and quantity due to loss of forest cover and service provision 	<ul style="list-style-type: none"> • Delimit, set-aside and protect riparian forests (these should be identified by following streams and tributaries to their source). Buffer zone width (each side) of 100m for the main rivers and 50 m for the tributaries should be set as a minimum⁸. There are various small pockets of forest that are not directly riparian areas and can be cleared if less than 20 ha in size and if not connected to the river network. • Ensure sufficient alternative land available for farming or compensation if there are no alternatives, and prohibit farming and logging in the forest zones; 	<ul style="list-style-type: none"> • Establish network of independent water monitoring stations ; • Regular monitoring of forest set-aside zones shows no encroachment by communities and operations; • Annual monitoring of set-aside zone shows at least no decrease in canopy cover; • Set restoration goal (natural regrowth) for riparian zone with 5 year milestones; • Regular review of implementation of relevant Olam's SOPs;

⁸ As proposed in Gabon's RSPO Draft Principles & criteria (2015)

	<ul style="list-style-type: none"> • Loss of potable water supply downstream • Flooding • Water pollution due to fertiliser and pesticide use 	<ul style="list-style-type: none"> • Ensure implementation of Olam's SOPs regarding chemical use (RSPO & Olam Farm code) • HCV sensitisation programme (internal & external) 	
5	<ul style="list-style-type: none"> • Loss of fertile forest land for farming • Loss of access to traditional hunting, fishing and NTFP grounds • Loss of water quality and quantity due to forest loss • Water pollution due to fertiliser and pesticide use 	<ul style="list-style-type: none"> • Ensure sufficient alternative land available for farming or compensation if there are no alternatives; • Establish a community development programme to provide alternative food sources, with emphasis on availability of suitable protein; Ensure controlled access for fishing; • Strict hunting SOP for all Olam staff and all local communities applicable inside the permit - including zero tolerance to any form of illegal hunting (hunting methods and protected species); • Control all hunting in forest zones coupled with provision of protein sources in the zone (Olam Hunting SOP enforcement patrols); • Ensuring rigorous FPIC process to find mutually agreeable solutions to HCV 5 threats and formalise in social contract (quid pro quo); 	<ul style="list-style-type: none"> • Establish and implement a participatory monitoring system to regularly track provision of basic needs to the community;
6	<ul style="list-style-type: none"> • Loss of access • Damage to resource 	<ul style="list-style-type: none"> • Enable all communities to have access to their HCV 6 sites; • Sensitise all communities that have identified any HCV 6 sites that are not on the validated HCV 5 & 6 maps; • Develop robust SOP for the identification, demarcation and enclavement and protection of all HCV 6 sites with the communities; • Ensure community member present when clearing operations occurring in any HCV 6 sensitive zones; 	<ul style="list-style-type: none"> • Develop a simple HCV 6 monitoring system and ensure annual internal reporting against it;

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Proforest Limited
South Suite, Frewin Chambers
Frewin Court, Oxford OX1 3HZ
United Kingdom
T: +44 (0) 1865 243439
F: +44 (0) 1865 244820
E: info@proforest.net
W: www.proforest.net

Proforest is registered in
England and Wales,
company number 3893149