PALMAS
DEL IXCÁN

ASSESSMENT SUMMARIES AND MANAGEMENT PLANS FOR THE NPP 2018

PALMAS DEL IXCÁN LIMITADA

CONTENT

1. Company Information

The company Palmas del Ixcán Ltd., owns oil palm plantations in two places, District I is located in the municipality of Sayaxché, Petén Department, being at a distance of approximately 410 km from the City of Guatemala and 68 km from the departmental head. The District I is within the area of influence of the Basin of the Salinas River and micro basin of San Roman river and is also located within the buffer zone of the complex of protected areas in the southwest of Peten. North, South and West, is adjacent to agricultural landscapes, pastures and the Salinas River.

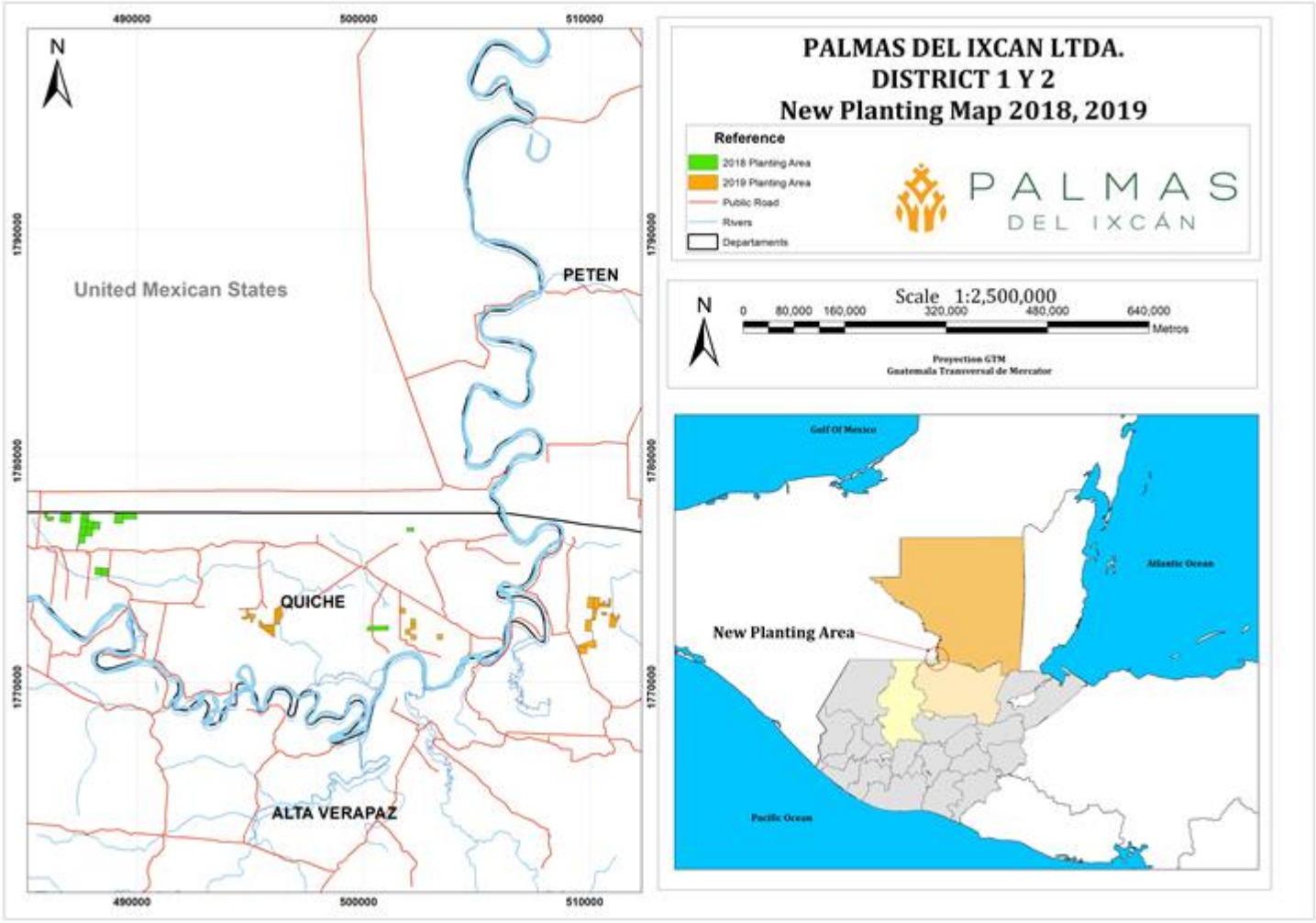
District II covers two sectors, located in the municipality of Chisec, Alta Verapaz department, near the Chixoy River basin within the Salinas River. The area is at a distance of 293 km from the capital city and 72 km from the provincial capital. The other part of this district is known as Ixcan, and it corresponds to a set of scattered plots within the municipality of the same name, in the department of El Quiché. This sector is approximately 315 km from the City of Guatemala and 151 km from the provincial capital. District II is also influenced by the river basin Salinas.

The New Planting project is for 408.40 has. In the area of Ixcan, Chisec aims to perform any conversion of use, and with the new plantings are not going to remove forest cover. Palm cultivation will only be conducted on those areas mainly dominated by pastures and crops, and which are not considered environmentally fragile areas. The new planting area is inserted in a rural area where agriculture and livestock are the main drivers of the local economy. All the properties destined to new plantations are private.

A HCV study was develop, with this HCV: HCV 1, HCV 3, HCV 4, HCV 5, and HCV 6 were identified in the wider landscape of properties intended for new plantations; HCV 1 and HCV 4 were identified under the precautionary principle. The total HCV management area allocated is of 96.8967 ha within the properties destined to new plantations.

The purpose of the HCV assessment is to identify any natural or cultural values considered exceptionally important within the properties intended for new plantations and their surroundings (wider landscape), before beginning any land preparation. The assessment began in April 2017 and concluded in April 2018, sending the report for quality review in August and a resubmission in November 2018. All the properties destined to new plantations are private, the Company has full rights over them counting on the legal possession of each one. There is no overlap with communal, concessions or state rights.

1.1 New Planting Map



1.2 Land title registers

CODE USED IN HCV	Municipality	Location	Comunity	Owner	Farm	Registry	Page	Book
PP-04	Ixcán	District 2	El Prado	Palmas del Ixcán Limitada	P-04	2060	60	25E
PP-09	Ixcán	District 2	El Prado	Palmas del Ixcán Limitada	P-09	2059	59	25E
PP-20	Ixcán	District 2	El Prado	Palmas del Ixcán Limitada	P-20	2068	68	25E
PP-30	Ixcán	District 2	El Prado	Palmas del Ixcán Limitada	P-30	2063	63	25E
PP-38	Ixcán	District 2	El Prado	Palmas del Ixcán Limitada	P-38	2062	62	25E
PP-46	Ixcán	District 2	El Prado	Tecniservicios	P-46	1224	224	23E
EP-29	Ixcán	District 2	Esmeralda	Tecniservicios	P-29	670	170	62E
EP-30	Ixcán	District 2	Esmeralda	Tecniservicios	P-30	4015	15	69E
EP-39	Ixcán	District 2	Esmeralda	Tecniservicios	P-39	2561	61	66E
EP-40	Ixcán	District 2	Esmeralda	Tecniservicios	P-40	888	388	82E
EP-41	Ixcán	District 2	Esmeralda	Tecniservicios	P-41	2563	63	66E
EP-44	Ixcán	District 2	Esmeralda	Tecniservicios	P-44	2283	283	65E
EP-48	Ixcán	District 2	Esmeralda	Tecniservicios	P-48	2285	285	65E
EP-49	Ixcán	District 2	Esmeralda	Tecniservicios	P-49	2558	58	66E
EP-50	Ixcán	District 2	Esmeralda	Tecniservicios	P-50	2282	282	65E
EP-51	Ixcán	District 2	Esmeralda	Tecniservicios	P-51	3006	6	67E
EP-52	Ixcán	District 2	Esmeralda	Tecniservicios	P-52	2560	60	66E
EP-53	Ixcán	District 2	Esmeralda	Tecniservicios	P-53	2564	64	66E
EP-57	Ixcán	District	Esmeralda	Tecniservicios	P-57	2567	67	66E

		2						
EP-58	Ixcán	District 2	Esmeralda	Tecniservicios	P-58	2622	122	66E
EP-59	Ixcán	District 2	Esmeralda	Tecniservicios	P-59	6757	257	74E
FP-26	Ixcán	District 2	Las Flores	Palmas del Ixcán Limitada	P-26	5861	361	32E
FP-32	Ixcán	District 2	Las Flores	Palmas del Ixcán Limitada	P-32	5860	360	32E
	Ixcán	District 2	Nuevo Paraiso	Palmas del Ixcán Limitada	P-38	48528	195	174
MP-22	Ixcán	District 2	Las Minas	Tecniservicios	P-22	62	62	1E
0P1-P1	Ixcán	District 2	Los Olivos	Tecniservicios	P-1-P1	48993	53	176
OP2-P1	Ixcán	District 2	Los Olivos	Tecniservicios	P-2-P1	1173	173	23E
OP1-P2	Ixcán	District 2	Los Olivos	Tecniservicios	P-1-P2	48992	52	176
OP2-P2	Ixcán	District 2	Los Olivos	Tecniservicios	P-2-P2	5044	44	11E
OP-04	Ixcán	District 2	Los Olivos	Tecniservicios	P-04	48631	298	174
OP-05	Ixcán	District 2	Los Olivos	Tecniservicios	P-05	48995	55	176
OP-25	Ixcán	District 2	Los Olivos	Tecniservicios	P-25	36781	291	148
SP-01	Ixcán	District 2	Sonora	Tecniservicios	P-01	1957	457	84E
	Ixcán	District 2	Santa Cruz	Tecniservicios	P-10	831	331	22E
SP-08	Ixcán	District 2	Sonora	Tecniservicios	P-08	47159	19	170
SP-09	Ixcán	District 2	Sonora	Tecniservicios	P-09	47161	21	170
SP-10	Ixcán	District 2	Sonora	Tecniservicios	P-10	47163	23	170
SP-11	Ixcán	District 2	Sonora	Tecniservicios	P-11	47229	89	170
SP-12	Ixcán	District 2	Sonora	Palmas del Ixcán Limitada	P-12	1163	163	43E
SP-18	Ixcán	District 2	Sonora	Tecniservicios	P-18	47219	79	170
SP-19	Ixcán	District 2	Sonora	Tecniservicios	P-19	47181	41	170

SP-27	Ixcán	District 2	Sonora	Tecniservicios	P-27	47179	39	170
SP-28	Ixcán	District 2	Sonora	Tecniservicios	P-28	1123	123	103E
	Petén	District 1	Finca Santa Bárbara	Palmas del Ixcán	P-01	7099	99	15E
QP-21	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-21	831	331	22E
QP-22	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-22	256	256	21E
QP-23	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-23	744	244	244
QP-24	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-24	638	138	22E
QP-25	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-25	640	140	22E
QP-26	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-26	222	222	21E
QP-27	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-27	641	141	22E
QP-28	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-28	820	320	22E
QP-29	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-29	4958	458	270E
QP-30	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-30	628	128	22E
QP-31	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-31	4960	460	270E
QP-32	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-32	848	348	22E
QP-33	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-33	1118	118	23E
QP-34	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-34	523	23	22
QP-35	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-35	2533	33	206
QP-36	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-36	1213	213	22E
QP-37	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-37	644	144	22E
QP-38	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-38	843	343	22E
QP-41	Alta Verapaz	District 2	Las Mercedes	Tecniservicios	P-41	8161	161	277E
	Alta Verapaz	District	Finca	Palmas del Ixcan	P-01	2207	217	9

		2	Victoria	Limitada				
TP-39	Alta Verapaz	District 2	Tierra Blanca 5000	Tecniservicios	P-39	28178	126	119
TP-40	Alta Verapaz	District 2	Tierra Blanca 5000	Tecniservicios	P-40	28178	126	119

2. Assessment process dates

2.1 HCV

No.	Activity	Description	Month/year
1	Initiation of the assessment	Compilation of existing information, general analysis of the assessment area, comparisons to the previous HCV effort (Bioterra 2015)	April 15, 2017
2	Planning and preparation	Designation of assessment team tasks, field trip planning and coordination with key local actors	May 1-5, 2017
3	Initial consultations of key actors and participatory workshops	Participatory workshops were held in communities in the area of influence of the NPP areas	May 15-19, 2017
4	Biological sampling and ecological site description	Sampling of flora and fauna at sites that had not been sampled for the REE effort in 2014 (López 2015)	May 15-19, 2017
5	Field data processing and analysis	Information was generated from the social and biological data collected in the field	June to August 2017
6	Creation of maps of areas of interest, identification of potential HCV areas based on satellite images	Analysis of data obtained during site visits as well as natural resource and cultural site mapping based on the interview and participatory workshop results	August to September 2017
7	Preparation of the HCV report	The initial draft was prepared by the assessment team a	October to December 2017
8	Company's feedback on the report	Report shared with the company representatives for review	January 2018
9	Consultations to validate findings	Meetings were held with COCODE leaders from local communities	March 26-27, 2018
10	Complete HCV report	Inclusión de comentarios de actores clave y comunidades a reporte	March 2018
11	Peer review (by an HCVRN registered peer reviewer)	Extensive review of report findings and subsequently specific responses to comments and observations made by the peer reviewer	February to April 2018
12	Submission of the completed HCV report to the HCVRN		April 20, 2018
13	Quality panel feedback received		August 8, 2018
14	Interviews and expert consultation	Process was required by quality panel to be strengthened	August 30- September 1, 2018
15	Re Submission of HCV report to ALS		November 30, 2018

2.2 LUC

The study was conducted between March and October 2017.

2.3 Social Impact Study

The study was conducted between January 2017 and January 2018.

2.4 Environmental assessment

It was carried out between January 2017 and June 2017.

2.5 Greenhouse gases evaluation

It was carried out between March and September 2017.

3. **Lead Assessors**

High conservation value assessment	Biologist José Luis López Consultant for HCV network ALS 15044JL Management of projects related to biodiversity, management of natural resources, citizen participation in environmental protection. Sampling of fauna, with a greater focus on ornithology.
Environmental Assessment	Ing. Agr. Hugo Mérida Environmental manager for Palmas del Ixcán College of agronomist No. 3082 College of Ministry Environment and Natural Resources No. 1106
Social Impact Study	Licda. Lesly Román CSR Business Advisor CENTRARSE The center for the action of social responsibility in Guatemala.
Greenhouse gases Evaluation	Green Development

	Ing. Amilcar Ordoñez Certified to ISO 14064 standards. 2006 and DIN EN 16001: 2009-08 (No. AI- Eesa - 002-11) and he has worked on the AENOR certifications and TÜV Rheinland.
LUC	Oscar González GIS Analyst and remote perception

4. Methods used for conducting assessments

4.1 HCV

The properties destined for new oil palm plantations are in the municipalities of Chisec and Ixcán, in northwestern Guatemala. In total, there are 62 independent properties scattered in both municipalities that make up the new plantations. Each property is legally registered in the Land Registry and is outside of communal lands. For this report, each property is identified with a code to facilitate its identification in the maps; details of location and extensions are detailed in Table 1.1. In the municipality of Chisec, department of Alta Verapaz, the properties for new plantations add up 107.61 ha. The properties of the municipality of Ixcán, department of Quiché, add up 263.15 ha. These properties do not have palm oil plantations, most are abandoned livestock lands or open lands that used to be corn and bean crops, or for grazing. Some have succession coverage, pastures or even regeneration cover known in Guatemala as "guamil" (INAB-CONAP 2015), which are mainly shrubbery and some pioneer trees with low and scattered canopies.

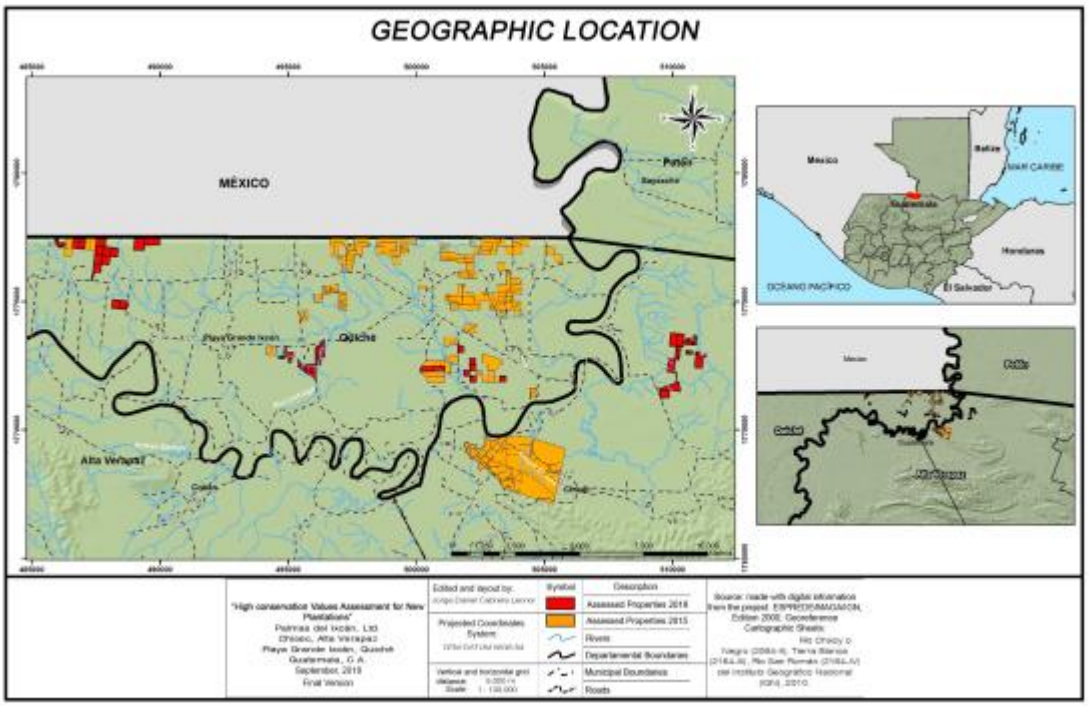


Figure 1.1 Geographic location of 2015 and 2018 HCV assessed areas of Palmas del Ixcán, Ltd

Table 1.1. Location and extension details of the properties for new plantations.

			Geographic Coordinates	
Municipality	Property code	Area (hectares)	Longitude	Latitude
Ixcán	PP-04	5.329	-90.46848	16.02436
Ixcán	PP-09	5.414	-90.47938	16.02431
Ixcán	PP-20	5.398	-90.48162	16.02641
Ixcán	PP-30	5.339	-90.47951	16.02851
Ixcán	PP-38	5.283	-90.47954	16.03061
Ixcán	PP-46	5.958	-90.48393	16.03490
Ixcán	EP-29	4.415	-90.54794	16.03385
Ixcán	EP-30	5.160	-90.54608	16.03276
Ixcán	EP-39	0.599	-90.54990	16.03200
Ixcán	EP-40	0.650	-90.54916	16.03188
Ixcán	EP-41	0.603	-90.54845	16.03185
Ixcán	EP-44	1.695	-90.54614	16.03099
Ixcán	EP-48	2.803	-90.54268	16.02960
Ixcán	EP-49	2.854	-90.54171	16.02873
Ixcán	EP-50	3.266	-90.54058	16.02801
Ixcán	EP-51	4.447	-90.53945	16.02767
Ixcán	EP-52	5.348	-90.53835	16.02728
Ixcán	EP-53	6.347	-90.53727	16.02689
Ixcán	EP-57	7.233	-90.53634	16.03254
Ixcán	EP-58	9.003	-90.53530	16.03283
Ixcán	EP-59	7.538	-90.53412	16.03460
Ixcán	FP-26	15.963	-90.59651	16.07265
Ixcán	FP-32	16.733	-90.60107	16.07171
Ixcán	MP-22	17.941	-90.49411	16.02786
Ixcán	OP-04	9.386	-90.62413	16.07200
Ixcán	OP-05	9.623	-90.62189	16.07190
Ixcán	OP1-P1	1.063	-90.61826	16.05979
Ixcán	OP1-P2	2.934	-90.63115	16.07340
Ixcán	OP-25	0.436	-90.63000	16.07150
Ixcán	OP2-P1	1.444	-90.63125	16.07244
Ixcán	OP2-P2	2.092	-90.62860	16.07161
Ixcán	SP-01	10.814	-90.40623	16.03814
Ixcán	SP-08	9.965	-90.40379	16.03792
Ixcán	SP-09	9.829	-90.39846	16.03852
Ixcán	SP-10	10.339	-90.39860	16.03683
Ixcán	SP-11	10.081	-90.39976	16.03693
Ixcán	SP-12	9.949	-90.40094	16.03703
Ixcán	SP-18	10.056	-90.40208	16.03713
Ixcán	SP-19	0.699	-90.40454	16.03511
Ixcán	SP-27	9.633	-90.40478	16.03323
Ixcán	SP-28	9.487	-90.40494	16.03153
Chisec	QP-21	13.563	-90.40121	16.03368
Chisec	QP-22	12.776	-90.40005	16.03359
Chisec	QP-23	3.078	-90.39744	16.03329
Chisec	QP-24	1.591	-90.39532	16.03211
Chisec	QP-25	1.592	-90.39716	16.03025
Chisec	QP-26	1.469	-90.40714	16.02901
Chisec	QP27	1.537	-90.40543	16.02512
Chisec	QP-28	1.519	-90.40577	16.03126
Chisec	QP-29	2.134	-90.40084	16.03813
Chisec	QP-30	4.552	-90.61500	16.07239
Chisec	QP-31	1.410	-90.61018	16.06892

Chisec	QP-32	1.530	-90.61287	16.06922
Chisec	QP-33	1.532	-90.61562	16.06955
Chisec	QP-34	2.063	-90.61599	16.06650
Chisec	QP-35	4.443	-90.61325	16.06617
Chisec	QP-36	12.363	-90.61636	16.06343
Chisec	QP-37	13.163	-90.61781	16.06120
Chisec	QP-38*	0.398	-90.60691	16.05037
Chisec	QP-41*	0.020	-90.60957	16.05066
Chisec	TP-39	15.994	-90.40671	16.02130
Chisec	TP-40	10.886	-90.40948	16.01907
	TOTAL	370.758		

* properties acquired as right of way (roads) to enter or transit between the properties destined for new plantations.

The Common Guide for Identification of HCV developed by the HCVRN (Brown, et al., 2017) was used to conduct the assessment, which suggests a pre-evaluation phase (scoping study) for all Tier 1 studies.

A Tier 1 was designated since the lead assessor has a temporary license, and not because of the scale, intensity or risk presented by the new plantation areas. However, the lead consultant has developed several assessments in the area of influence of the Company, including the rapid ecological assessment (López 2015) that served as an input for the biological and ecological component of the HCV assessment for the existing plantations of the Company (Bioterra, 2015). In 2017, a corporate responsibility assessment was done, to analyze if Palmas del Ixcán had any social responsibilities with the HCVs identified in 2015 (López and Escobar 2017). In that assessment, key stakeholders were identified with the company's community relations office, as to interview them. Also, communities were identified to approached them. In this process, community leaders were posted about the activities to be developed for this current HCV assessment. Therefore, additional visits for a scoping study for this HCV were considered unnecessary since it was possible to coordinate meetings with the communities and key actors of the evaluated area. Additionally, the 2015 HCV assessment (Bioterra, 2015) of the existing plantations is available, which covers a large part of the areas that are destined for new plantations. Several communities visited already had knowledge of the HCV assessment process due to that first experience and the certification process through the EISA (Centrarse, 2017).

Existing Information

The Company provided all secondary information relevant to this study. Due to the fact that this assessment is part of the process to meet RSPO certification requirements the company already had commissioned many of the relevant studies, such as: environmental impact assessments (EIA) (Ambiente y Desarrallo, 2015), HCV (Bioterra, 2015), rapid ecological assessment (REA) (López 2015), and the social impact study (CENTRARSE, 2017), to mention a few. These studies were mostly prepared for the area evaluated by the 2015 HCV, which influence most of the areas destined for new plantations. Other instruments collected were management plans for protected areas that are in the region (CONAP / TNC, 2006), municipal and departmental development plans (SEGEPLAN 2011), maps of natural disaster risk in the region, among others.

Primary Information

There are six categories of HCV, categories 1 to 3 are environmental / biological issues and categories 4 to 6 are social /cultural; although HCV 4 involves both ecological and social aspects. Once the information gaps were identified during the pre-evaluation phase, field visits were planned for the collection of data and information in pre-selected areas during fieldwork.

Field sampling were performed at different sites of interest, which were previously identified in land coverage maps, land use maps, among others, in the initial phase and that include riparian zones, flood zones, forest remnants and rivers or streams. Seven sampling points were identified (Figure 2.1 to 2.4), including a sampling point for the 2015 assessment that coincides with Landscape 3 (Figure 2.3). The REA information (López 2015) served as a complement for the identification of HCVs 1 to 3, including the rare, threatened and endangered (RTE) species that are in the area.

Table 2.1. Biological sampling site coordinates

Sampling site	**UTM WGS 84 15Q** X	Y	**Wider Landscape**
1	755125	1777658.8	Landscape 1
2	763173.16	1773548.23	Landscape 2
3	762677.54	1773407.5	Landscape 3
4	768403.37	1773618.84	Landscape 4
5	769814.64	1773258.8	Landscape 5
6*	770592	1773669.61	Landscape 6
7	777783.7	1774854.39	Landscape 7

Source: Own elaboration, 2017.

* Sampling point 6 is from the HCV assessment of 2015, its location is within landscape 3, so the information was used to complement the current one.

Biological component: At each point, sampling units for flora and fauna were established. With the samplings, the information generated in the REA of 2015 was strengthened, which complemented the species information for landscape 3. The sampling of flora had greater effort because in some areas of new plantations, some coverage might be cleared. Transect sampling method allows to record a lot of biological information in a brief time, it is a fit to small fragments of forest and it is easy to replicate in different strata.

Birds: Record by means of transects with lengths between 500 to 1000 meters, following in most the pattern of the path established. All direct observations and vocalizations of birds are recorded in the transects, bird guides for resident birds (Howell et al., 1995; Peterson, 1973) and migratory birds (National Geographic, 1999) were used. No recordings (playbacks) are used to attract birds.

Mammals: transects of lengths between 500 m and 1000 m, depending on the terrain, topographyand size of the property were established. Direct observations and tracks of mammals are recorded.

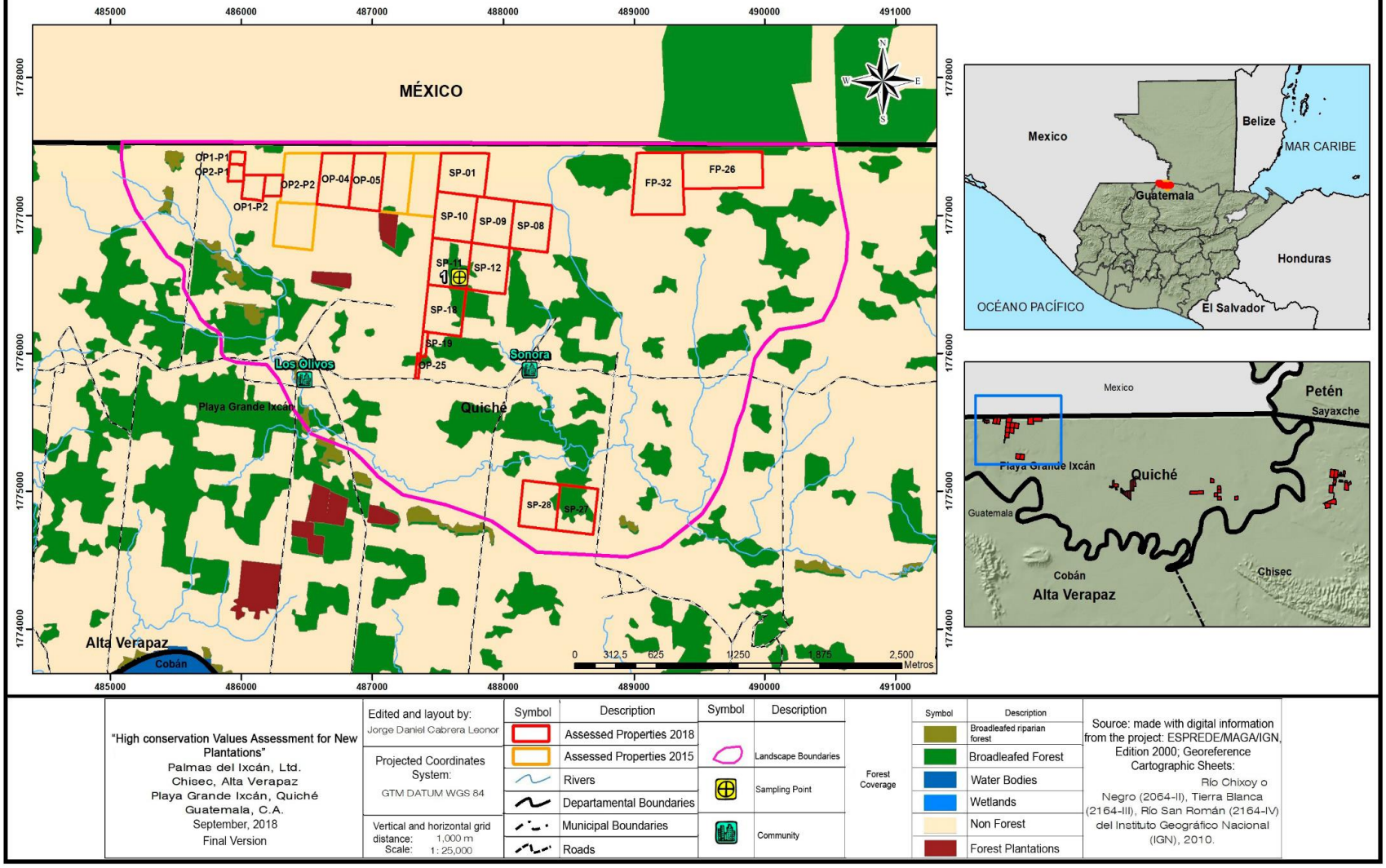
For the identification of species, mammals' guides and their tracks are used, also a camera tophotograph fingerprints, and a ruler to scale footprints. Another method was interviews with people in the locality. Some areas of new plantations had no surrounding communities, so information of field collaborators of the Company was gathered. Figures from the mammal guides (Reid 2009) are used for people to identify the species they mention, including game species.

Herpetofauna: transects were established and recorded any direct observations of species. Also, through interviews, information was obtained on the species richness of the area. Nocturnal samplings were not done due to safety issues in the area. Amphibian identification guides (Kohler, 2011) and reptiles (Kohler, 2008) were used for identification.

Flora: The type of sampling used within each stratum was preferential or selective sampling, placing the sampling units in typical or representative sites based on subjective criteria (Matteucci and Colma 1982). In forests, plots of 500 m_2 were used as they have trees with an adequate diameter at breast height and higher heights. The second method used in guamiles or secondary growth forests was transects, which is designed and dimensioned according to a sampling band on which the data is taken (Phillips and Miller 2002). The transects were made using an area of 100 m_2 (10 m x 50 m) for the tree stratum, with profiles of 2 m for the shrub stratum and 1 m for the herbaceous stratum.

For the identification of HCVs 2 and 3, also official geographic information of the country of protected areas was used, including the updated layer in .kmz format (CONAP, 2015), coverage (ESPREDE / MAGA / IGN, 2000) important areas for birds and ecosystems. Other sources consulted were the global map of intact forest landscapes (IFL) (http://www.intactforests.org/), key areas for biodiversity (http://www.keybiodiversityareas.org), important bird areas (IBA) (http://datazone.birdlife.org/site/factsheet/lachu%C3%A1--ikbolay-iba-guatemala) and literature on fragmentation and its role in biodiversity since the area evaluated is quite degraded.

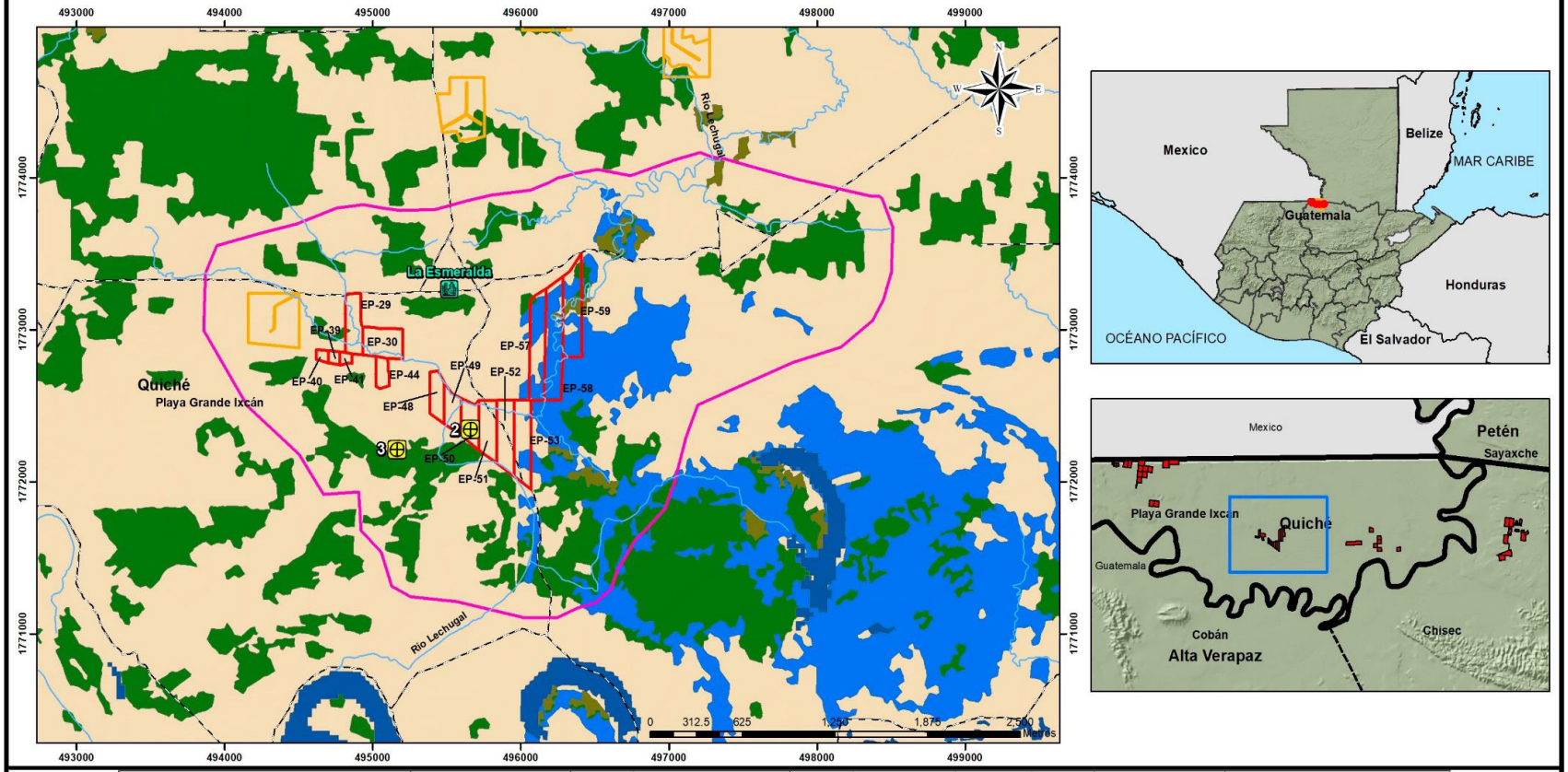
SAMPLING POINTS (LANDSCAPE 1)



"High conservation Values Assessment for New Plantations" Palmas del Ixcán, Ltd. Chisec, Alta Verapaz Playa Grande Ixcán, Quiché Guatemala, C.A. September, 2018 Final Version	Edited and layout by: Jorge Daniel Cabrera Leonor Projected Coordinates System: GTM DATUM WGS 84 Vertical and horizontal grid distance: 1,000 m Scale: 1: 25,000	Symbol	Description	Symbol	Description	Forest Coverage	Symbol / Description
			Assessed Properties 2018		Landscape Boundaries		Broadleafed riparian forest
			Assessed Properties 2015		Sampling Point		Broadleafed Forest
			Rivers		Community		Water Bodies
			Departamental Boundaries				Wetlands
			Municipal Boundaries				Non Forest
			Roads				Forest Plantations

Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

SAMPLING POINTS (LANDSCAPE 2)



"High conservation Values Assessment for New Plantations"
Palmas del Ixcán, Ltd.
Chisec, Alta Verapaz
Playa Grande Ixcán, Quiché
Guatemala, C.A.
September, 2018
Final Version

Edited and layout by:
Jorge Daniel Cabrera Leonor

Projected Coordinates System:
GTM DATUM WGS 84

Vertical and horizontal grid distance: 1,000 m
Scale: 1: 25,000

Symbol	Description
	Assessed Properties 2018
	Assessed Properties 2015
	Rivers
	Departamental Boundaries
	Municipal Boundaries
	Roads

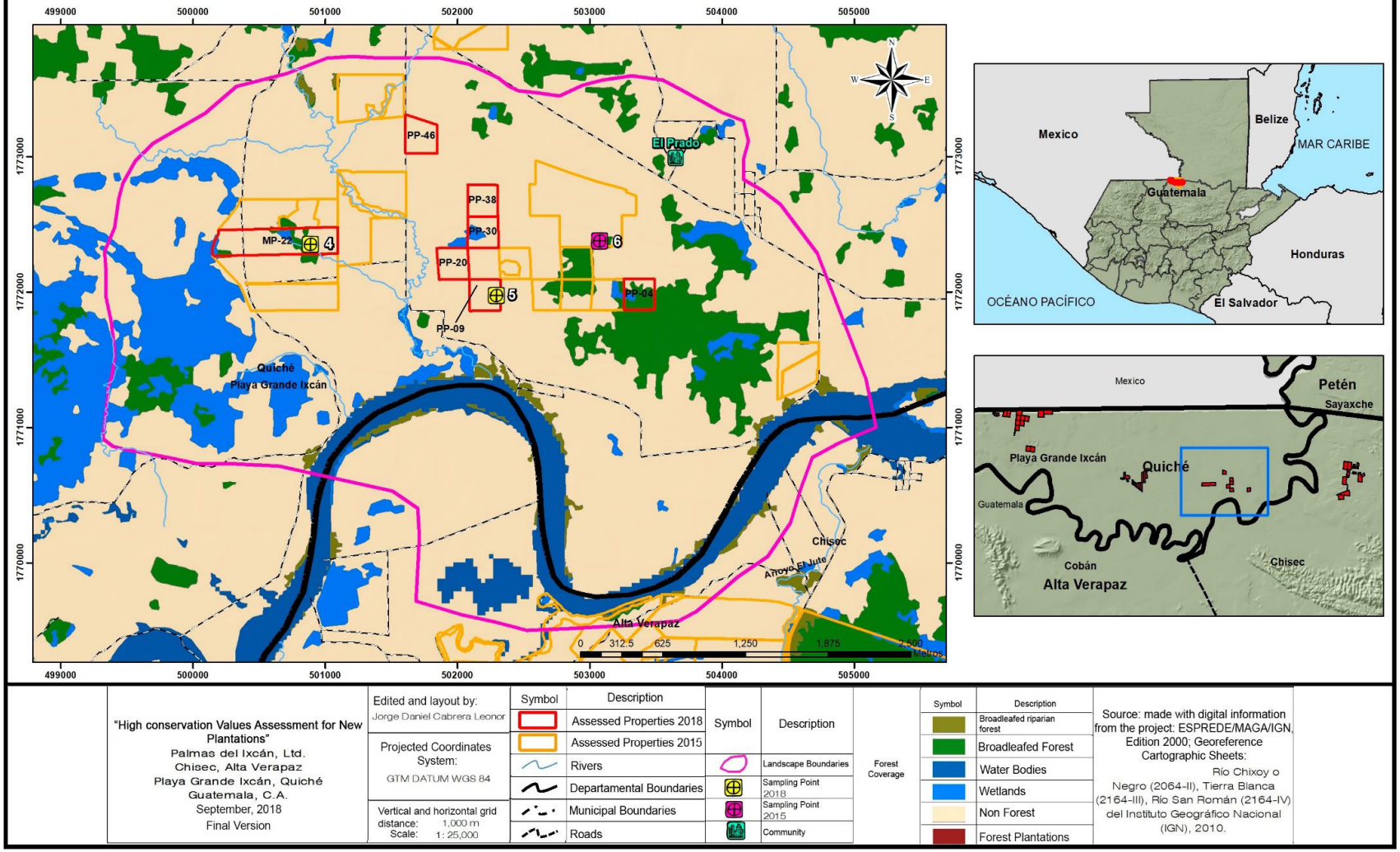
Symbol	Description
	Landscape Boundaries
	Sampling Point
	Community

Forest Coverage

Symbol	Description
	Broadleafed riparian forest
	Broadleafed Forest
	Water Bodies
	Wetlands
	Non Forest
	Forest Plantations

Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

SAMPLING POINTS (LANDSCAPE 3)



"High conservation Values Assessment for New Plantations"
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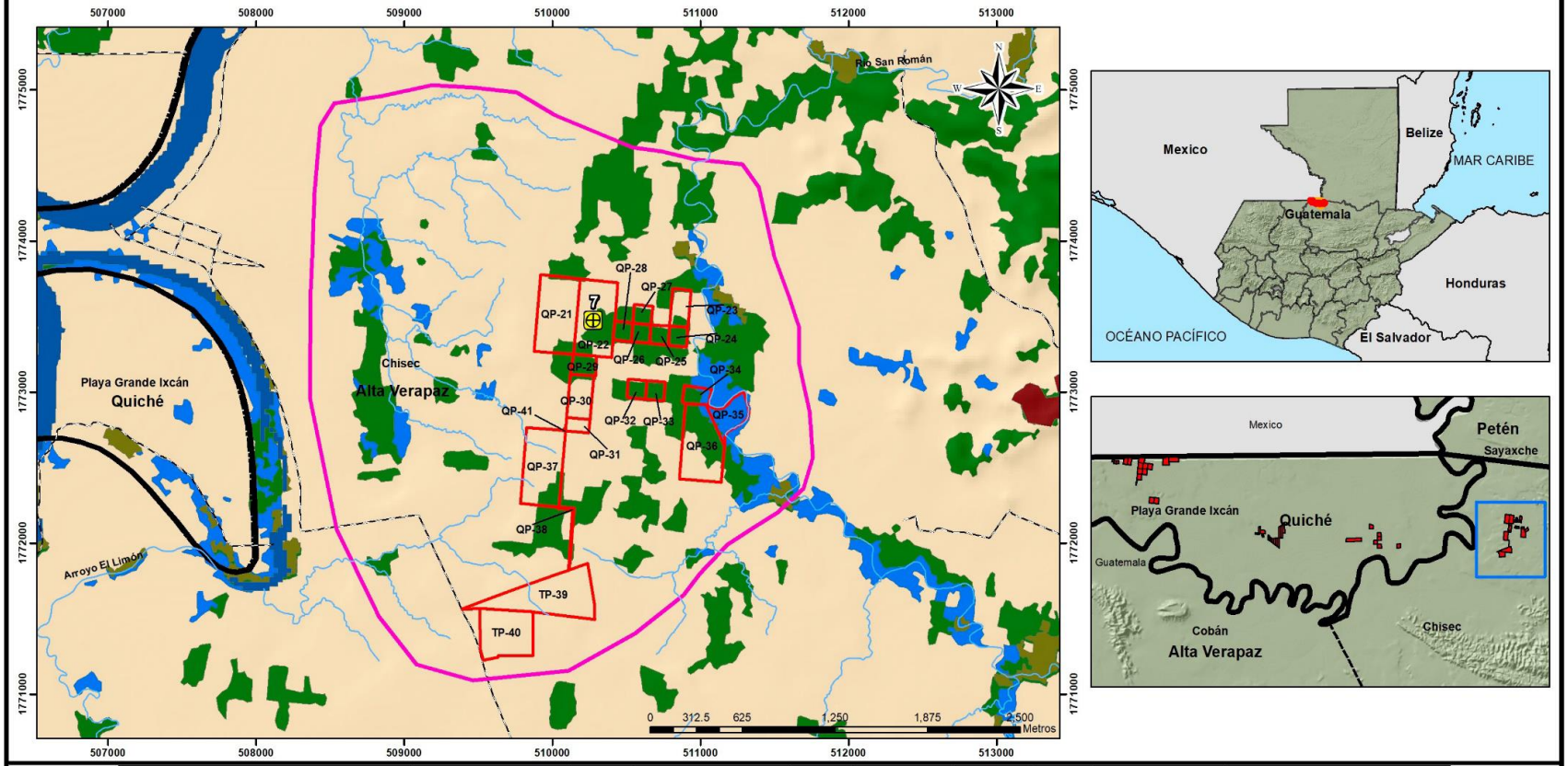
SAMPLING POINTS (LANDSCAPE 4)



"High conservation Values Assessment for New Plantations" Palmas del Ixcán, Ltd. Chisec, Alta Verapaz Playa Grande Ixcán, Quiché Guatemala, C.A. September, 2018 Final Version	Edited and layout by: Jorge Daniel Cabrera Leonor Projected Coordinates System: GTM DATUM WGS 84 Vertical and horizontal grid distance: 1,000 m Scale: 1:25,000	Symbol	Description	Symbol	Description	Forest Coverage	Symbol / Description
			Assessed Properties 2018		Landscape Boundaries		Broadleafed riparian forest
			Assessed Properties 2015		Sampling Point		Broadleafed Forest
			Rivers		Community		Water Bodies
			Departamental Boundaries				Wetlands
			Municipal Boundaries				Non Forest
			Roads				Forest Plantations

Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

For the identification of HCV 4, 5 and 6 communities identified within the four wider landscapes were approached; the landscapes were delimited by physical, administrative and coverage barriers (Table 2.2 and Figure 2.5 and 2.6). The results obtained by the previous study of HCV (Bioterra, 2015) as a secondary source were considered, in some cases the key actors interviewed in that assessment coincide or are very close to the wider landscapes defined for the current assessment. In the 2015 assessment HCV 5 was identified in these areas, however, in that report it is not clear the locations of these values, nor were they mapped, it only mentions that HCV 5 corresponds to the rivers in the area.

What is relevant is the homogeneity of the region where both existing and new plantations are located, which allows us to consider the results of the previous evaluation, albeit in a general way. Other secondary sources include the Social Impact Study (Centrarse, 2017), and the InitialEnvironmental Assessment (Ambiente y Desarrollo, 2015) and Socioeconomic Study of the communities in the area of influence of the Palmas del Ixcán project (Ambiente y Desarrollo, 2008). For archeology topics (HCV 6) the layer of archaeological sites nationwide was reviewed.

We investigated scientific documents about potential archaeological sites in the area under evaluation and consulted an expert on the potential cultural value of the area (interview with Ponciano, 2018, archaeologist). Most of the communities in the area of interest of this study have already been addressed on several occasions, including some community members have expressed that they "feel overwhelmed" by the numerous studies and their intervention required. Therefore, of the six communities identified, four were directly intervened by this study and the rest was worked with the information collected in the studies. The communities intervened *in situ* were: Los Olivos, Sonora, Esmeralda and El Prado.

Table 2.2. Population centers in the area of direct influence of the new plantation areas assessed

Community	Population in 2002*	Projected population in 2016	Coordinates (UTM WGS 84 15Q)	
			X	Y
Los Olivos	484	903	753952.2	1776901.62
Sonora	278	518	755672.68	1776992.39
La Esmeralda	333	621	763022.11	1774469
El Prado	269	502	771162	1774290
Total	**1364**	**2544**		

**Source: Instituto Nacional de Estadística (INE, National Institute of Statistics) 2003*

Participatory workshops were held in each of the four communities in order to identify whether the socially relevant HCVs were present from direct sources. These activities were developed in coordination with local Community Development Councils (COCODEs), which are the official community sociopolitical organizations derived from the governance decentralization laws of Guatemala. These groups are comprised of community leaders who watch over community interests with respect to governmental and private sector activities. For example, COCODEs grant authorization to carry out activities such as the participatory workshops employed for this study,

they also decide if only COCODE representatives participate in such events or whether other community members should be involved. This may exclude minority groups or key actors within the community and relevant to the evaluation. However, the assessing team respected these decisions. The workshops were based on thematic interests, in this case the identification of specific potential HCVs 4, 5, and 6, based on key questions about these components under a defined agenda.

Interviews to 22 key actors of the wider landscapes were made, including two experts in forests and ecosystems (they work in the INAB and Botanical Garden) and an expert in archaeology (works in Tikal National Park) whose characteristics are listed in the following table:

Table 2.3. Sectors and institutions of the interviewed key actors

Sector	Institution
Government	Lachuá National Park (INAB)
	Strategic Ecosystems Unit (INAB)
	Departmental Directorate of Education (MINEDUC)
	Mediterranean Fly Eradication Program (MOSCAMED)
	Vectors; Ministry of Public Health and Social Assistance
	Teachers of educational institutions
	Technical Unit of the Tikal National Park
Local Government	Mayor
	Councilor in charge of the Environment Commission
	Directorate of Municipal Forest Office
Civil Society	Botanical garden of the University of San Carlos
	COCODES Presidents
	Protestant leaders
	Small producers

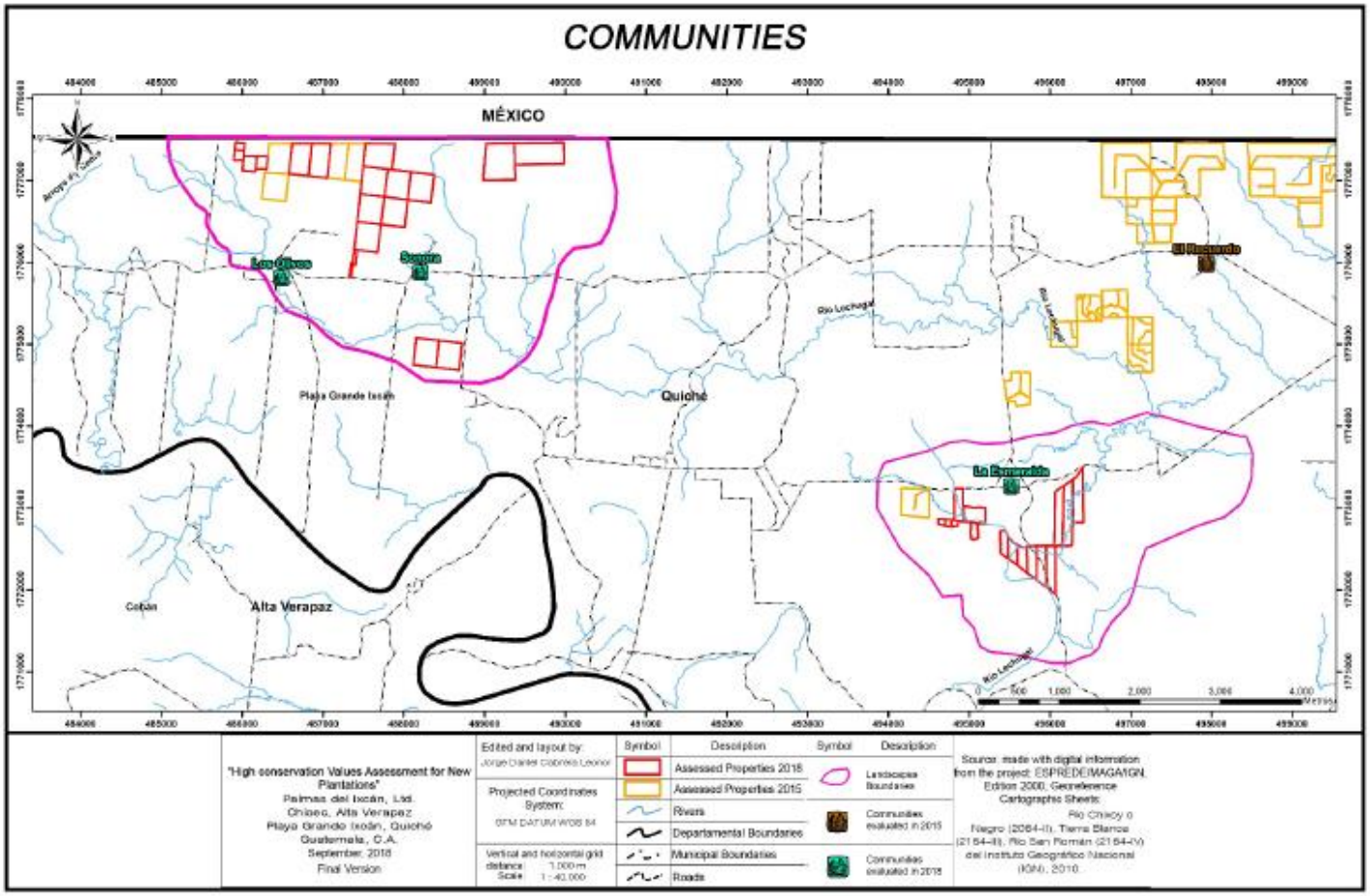


Figure 2.5. Communities in wider landscapes 1 and 2.

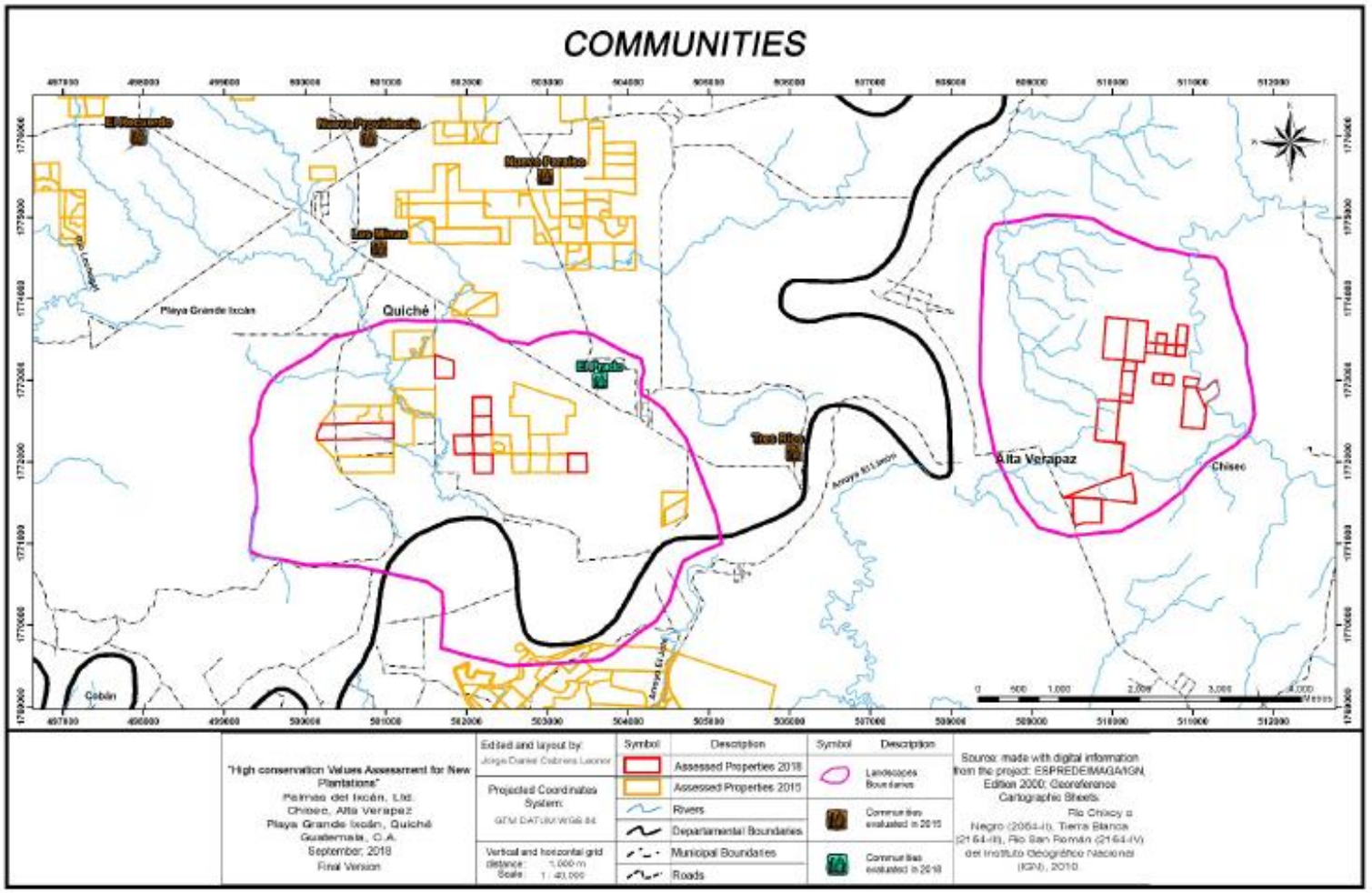


Figure 2.6. Communities in wider landscapes 3 and 4.

Assessment team

The multidisciplinary team of specialists who contributed to the development of this HCV assessment is constituted by environmental and social professionals (Table 1.3). Support in the field for the collection and identification of botanical samples from the evaluated area was also provided by a forestry expert as well as local guides. Each member of the assessment team had a specific role in the execution of the study, and subsequently contributed to the data analyses, synthesis of information and preparation of the final study report.

Table 1.3. HCV Assessment team

Name	Role	Specialty/focus
José Luis López	Lead Assessor	Biologist: responsible for biodiversity research, natural resource management, social participation in environmental protection, and fauna sampling (principally ornithological) efforts
Ximena Hernández	Field Coordinator	Biologist: responsible for the coordination of terrestrial biodiversity sampling, water quality, and environmental impact analysis efforts
Oscar Escobar	Social Researcher	Social worker: responsible for the design and execution of participatory social exchange events with local communities and interviews with key local actors
Jorge Cabrera	GIS Specialist	Agronomist: responsible for the management of geographic information and environmental sampling

4.2 LUC

a. Process overview

The development of data changes in the land use decision based on the satellite image obtained by the Landsat sensor 7 and 8 (only for the northern section of the country, corresponding to the zone of imagen, Path 20 Row 49 LANDSAT).

For changes in the generation process, soil from to year 2006 to 201 7 uses different verification points and verification was taken for each year approximately in the area of interest. These classes were divided into 8: Coverage with forest, Farmland (No coverage Forest), vegetation Shrub (Matorral- Guamil), (Pastures grown), Communities, Waterbodies, Wetlands and without information (Cloud and Shadow) of the years 2006, 200 7, 2010, 2014 and 2017.

The first classification of images bands 4, 5.7 was used to define 8 classes and execute a monitoring using the software package ERDAS IMAGE classification. The second group was used to verify and review the classification by contingency testing using the ArcGIS software package. Sources of information used and spatial and temporal distribution of the images used.

This study included the following sources of geographic information:

• Landsat 7 and 8 for the years Images: 2006, 200 7 , 2010 and 2014 (base map)

• The availability of images depends to a large extent on their quality, which depends on the percentage of cloud coverage, as well as the radiometric characteristics.

b. Selection of images

The images were selected according to the following characteristics:

• Data collected during the dry season (January to April) the years of interest.

• International standards require that the dates of image cartography be within ± 1 year of the selected date (GOFC-GOLD, 2009).

• Absence of clouds and other atmospheric artifacts such as smoke and haze.

Additional images were selected with the same criteria to be used in the filling process, images with problems of lack of data (clouds or problems in the satellite sensor).

c. Geometric accuracy

A geometric precision value of the acquired images is determined and geometrically corrected. For this selection process as originally acquire the Landsat image (UTM15 WGS84) is used. Generating control points for the study area..

d . Classification and view for manual editing

The classification of the satellite images was developed with a supervised method using this mask 8 classes and cloud, as training for the computer to classify the whole image or the area of interest.

This training point is established in areas where the change in land use is known and where the spectral information is extracted. This automated classification process has its limitations mainly because it tends to confuse very similar areas.

For this it is necessary to develop a manual edition of the classified product to reclassify the area error. This process ERDAS IMAGE and Arc Gis work, so that they show analysis and can be observed with other cartographic information that helps us improve our classification changes in use and that can handle the review individually by image may have the wrong class.

Finally the classes shown in the Table were grouped to achieve the objective classes of classified image. Thus, the classes of that table were reclassified to the category of forest; Classes 5, 6 and 7 remained unchanged, areas used for paddocks.

e . Five classes were used in the classification process:

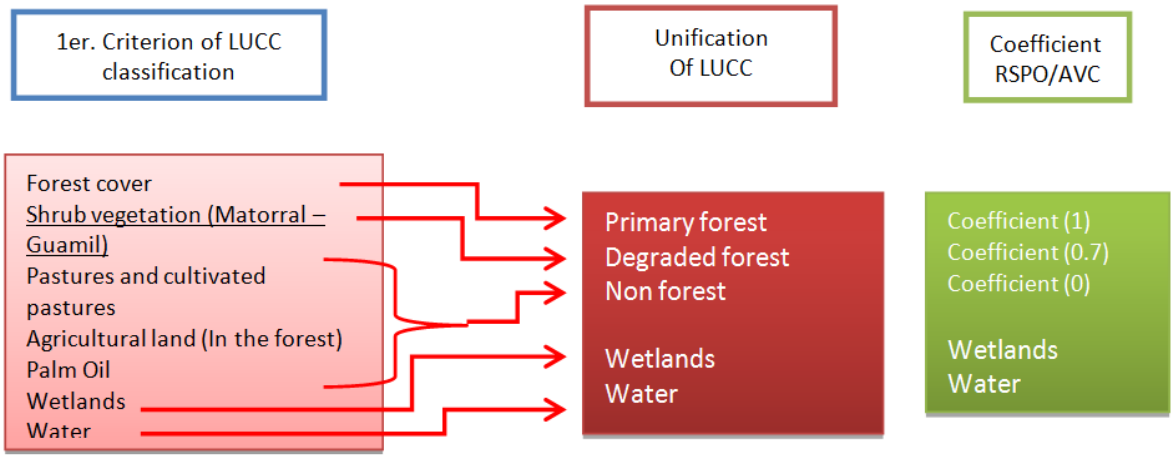
1) Forest coverage
2) Agricultural Lands (Coverage without forest)
3) Pastures / cultivated pastures
4) Shrub vegetation
5) Town and / or Urban
6) Water
7) Wetlands

Observations. (Cultivated Pastures, Scrub-Shrubs, Guamil and Lands in preparation)

This step is applied after returning the classification published in RASTER or IMG format, in order to clean loose dispersions of pixels and small groups of pixels. To make this identifier separate pixels within a homogeneous class (Clump) and then a feature to eliminate pixels (Delete) Erdas, 2015) that are not covered in a certain defined minimum size and apply the same category. In this case, the minimum size of land use changes of 0.54 Ha or 6 pixels was taken into account.

F. Method to evaluate the LUC by categories:

Evaluation of LUCC according to RSPO coefficient, they will be listed and categorized as it happens:



It is the method that will be used for the Area in 10 communities for the Company of Palmas de Ixcán Ltda., Taking the base of the RSPO coefficient indexes .

G. Estimation of exchange rates

At the end of the mapping process for the years 2006, 200 7, 2010, 2014 and 2017, we proceeded to superimpose both maps to identify areas with change and that the soil remains unchanged. And the changes generated this layer was revised again rankings each year to ensure that changes in land use detected were real and not the result of an artificial variation in reflectance images. These raster classified, the land use change 2006 - 201 and dynamic changes were the basis for all calculations presented in the results section.

All calculations are based on the results of a basic interest area (sowing area - Ixcan - Chisec). For each of these units was estimated that the amount of change in land use for each year of interest and dynamic performing an intersection among the polygonal area of these raster. Rasterization of changes in forest cover results in information gain and loss of forest degraded in the base area in question.

This information allows to calculate the change in forest cover for a specific area.

4.3 Social Impact Study

The methodology developed to obtain the inputs of the present evaluation consisted of a participatory process carried out by Palmas del Ixcan and Centrarse to ensure that the communities in the area of influence of the lands where Palmas del Ixcan will be making new plantings are informed about the development of new plantations and their benefits or possible effects on communities. And the identification of the planting will be on property of the company. CentraRSE proceeded to conduct a documentary review of the calls, minutes, delimitation maps of areas, attendance lists and photographs to corroborate that the process has been carried out in a participatory manner and that includes the interested parties and to be able to extract and interpret the main social impacts that can be evidenced and derived from the operations of Palmas del Ixcan, especially for the plantations that will be established during 2018.

4.4 Greenhouse gases evaluation

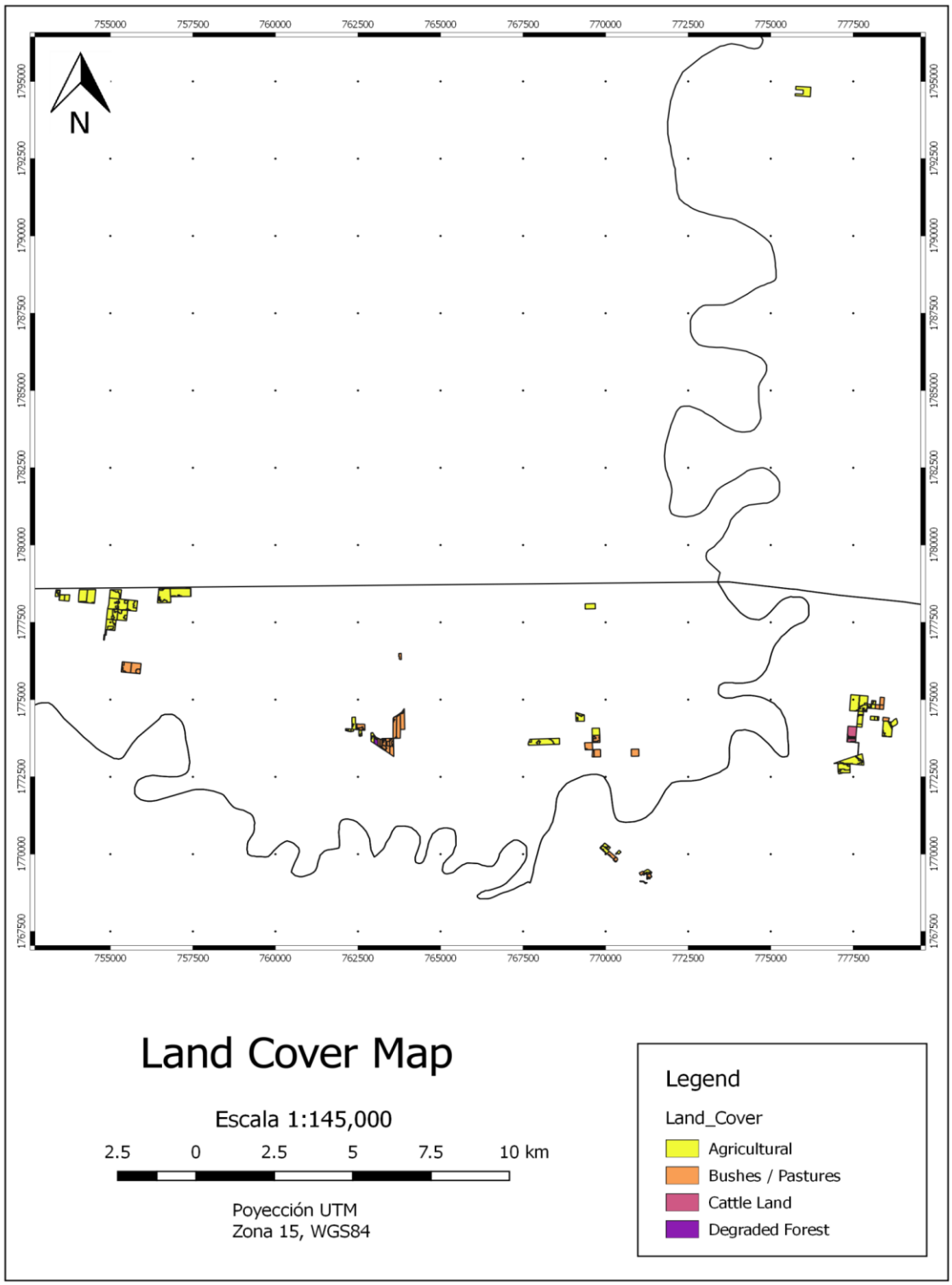
For the quantification of the carbon footprint of the new plantations project of Palmas del Ixcán, it was used the tool developed by the Working Group on Greenhouse Gases (GHG) of the Roundtable on Sustainable Palm Oil (RSPO), called New Development GHG Calculator.

An estimate was made of the net GHG emissions associated with palm oil production, by quantifying the main forms of emissions and GHG sequestration, from the mill to the supply base. The emissions are presented in tons of carbon dioxide equivalent (tCO2e) per unit of product (CPO and PKO).

Stratification and estimation of carbon stocks in Palmas del Ixcán

The stratification of the land coverage for the area of the new plantings was done by a Geographical Information System, in the following maps it can be observe the detail of each stratus including land use, degraded forest and areas located in the estate of the proposed development of common use:

Figure 3. Stratification and soil coverage for plantings 2018, Palmas del Ixcán



Source: Palmas del Ixcán - LUCC, 2017

Regarding the estimation of carbon stocks, RSPO establishes that the predetermined values of the PalmGHG Calculator or other values that can be more precise depending on the country. In the case Palmas del Ixcán the values used for estimation of carbon stocks in the area of new planting of palm oil were the predetermined values of the PalmGHG Calculator. The areas were the new plantings will be taken place are solely covered by cattle lands, bushes and Agricultural lands. The PalmGHG Calculator establishes that 5 tons of carbon are stocked per hectare with grasslands, 8.5 tons of carbon per hectare for agricultural areas and 46 tons per hectare for areas with shrubbery. For the calculation for conservation area sequestration was used RSPO's default carbon sequestration value stablished on 1.5 tC/ha/yr (5.5 tCO2e/ha/yr) for Latin America.

For the calculation of carbon on forest the national sources were used because the country of Guatemala has this type of studies and therefore values will have more precisión because they come from studies done in the same territory. The results that were used where from a study by Universidad del Valle de Guatemala Environmental Study (Quilo, 2007). The results determined the characterization and vegetable carbonstock of the forest latifoidal soil in the northern area of the country. The study stated that for each hectare of natural humid forest in Guatemala, the superficial and underground biomass can stock up to 199 tons of carbon. The data presented was taken from 4 plots in floodable areas and 10 plots of trees in non-floodable areas, the calculations were done with allometric equations that took into account the diameter, height, weight and volume of trees to quantify the biomass.

It is important to mention that a **verification of the stratification** in the areas of new plantings was done and can be observed in the following images of the field visit:

Figure 4. Stratums of soil coverage (grassland or cattle land) in the area of New Plantings

Source: Green Development, 2017.

Figure 5. Stratums of soil coverage (Degraded forest) in the area of New Plantings

Source: Green Development, 2017.

Figure 6. Stratums of soil coverage (Agricultural) in the area of New Plantings

Source: Green Development, 2017.

Figure 7. Stratums of soil coverage (Bushes) in the area of New Plantings

Source: Green Development, 2017.

Considering solely the stratification of the area of new plantings of Palmas del Ixcán (areas outlined red on the maps of vegetable coverage), the following table details the quantity of carbon stocked:

Table 1. Estimation of carbon stock/ha in different stratums of land cover in new development area of Palmas del Ixcán

Type of vegetation	Area (ha)	Estimated carbon (tC/ha)	Carbon Dioxide stocked or sink (tCO_2e/ha)	Total carbon stocked or Sink (tC)	Total Carbon Dioxide (tCO_2e) stocked	Total Carbon Sinks (tCO_2e)
Agricultural	199.567	8.5	31.167	1,696.32	6,219.89	--
Cattle Land	22.174	5	18.334	110.87	406.53	--
Bushes	183.89	46	168.668	8,458.94	31,016.40	--
Degraded forest	2.7633	1.5*	5.50	4.14	--	15.20
TOTAL	**408.40**	**61**	**223.67**	**10,270.27**	**37,642.82**	**15.20**

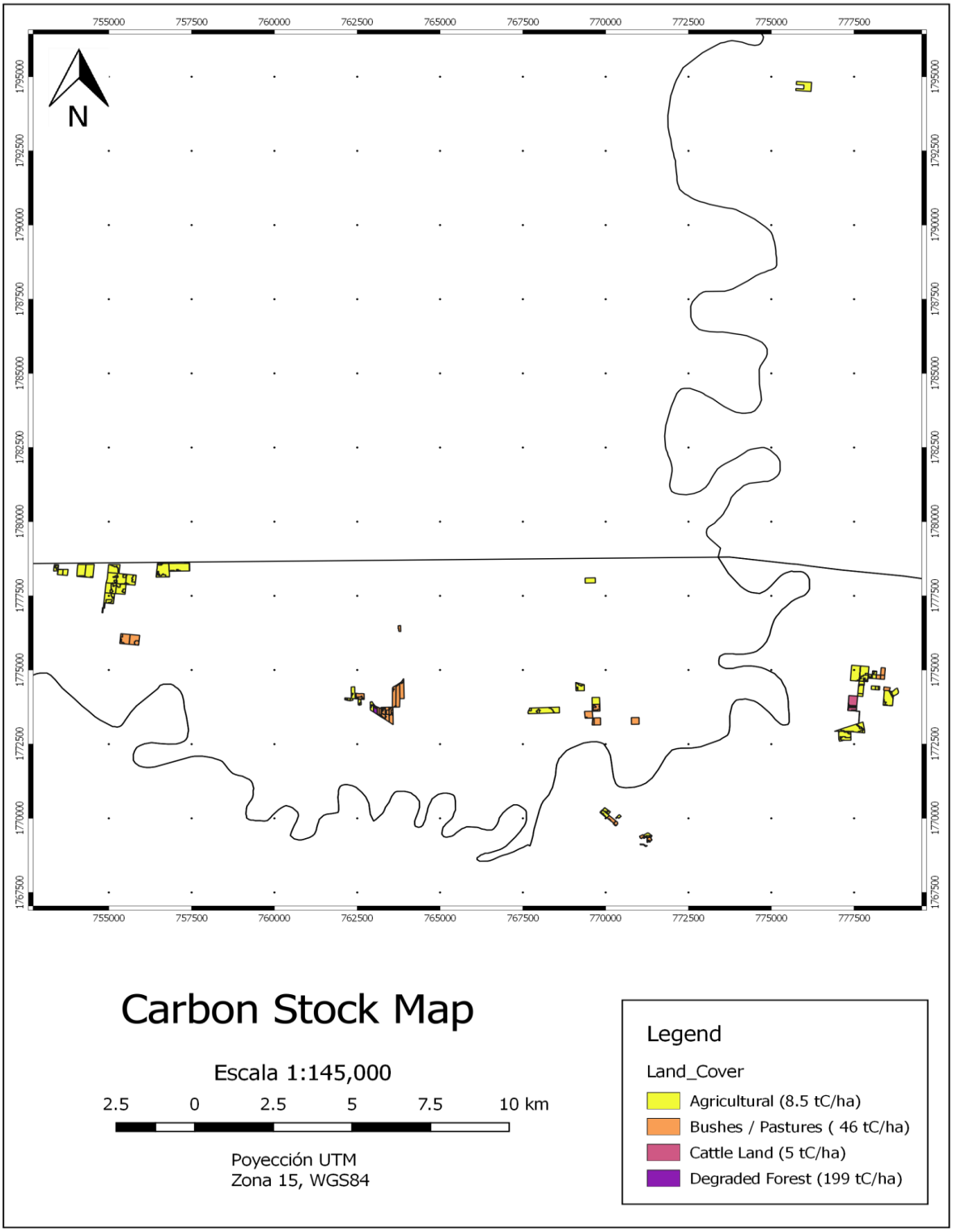
** RSPO's default carbon sequestration value*

Table 2. Total developent areas (ha) and carbon stock estimation according to land cover type

Designated Use	Land Cover Type	Total Influence Area (ha)	Carbon Dioxide stocked & sink (tCO_2e/ha)	Total Carbon Dioxide (tCO_2e) stocked	Total Carbon Sinks (tCO_2e)	Total emissions tCO2e/yr. (including land cleared for other use)
Development Area	Agricultural	199.5671	31.167	6,219.89	--	248.82
	Cattle Land	22.1741	18.334	406.53	--	16.26
	Bushes	183.8942	168.668	31,016.40	--	1240.70
Conservation	Degraded Forest	2.7633	5.50	--	15.20	--
Total		**408.40**	**223.67**	**37,642.82**	**15.20**	**1505.78**

Fuente: Green Development based on New Development GHG Calculator RSPO, 2017

Figure 8. Carbon Stock Map



Source: Green Development, 2017

EVALUATION OF GHG EMISSIONS FOR NEW DEVELOPMENT OF PALMAS DEL IXCÁN

The carbon footprint is the most efficient tool to measure the impact or the mark a person, industry or activity makes to the planet with a recount of emissions of carbon dioxide (CO2) liberated to the atmosphere. Therefore, the carbon footprint is the measurement of the impact induced by the activities of the human towards the environment and it is determined according to the amount of GHG produced, measured in the unit of equivalent carbon dioxide.

According to methodology used, an evaluation of Green House Gases Emissions for the new development of Palmas del Ixcán was made; this evaluation shows the breakdown of projected emissions by focus, as well as the unit emissions. This quantification was made using the RSPO tool, "New Development GHG Calulator" and results appear on next title 9.1.

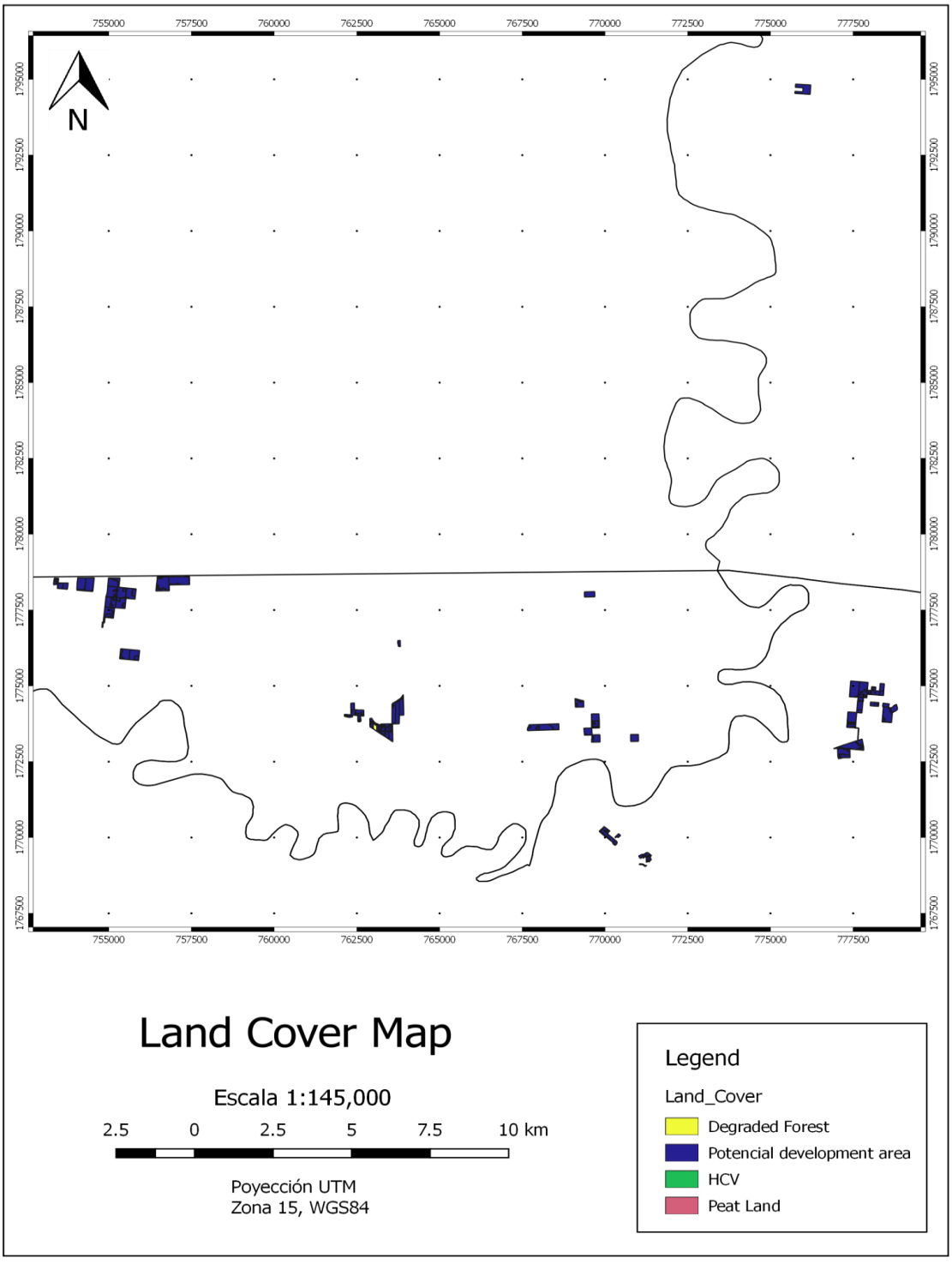
On next table and figures 9 and 10, is a summary of carbon stock identified on previous chapter. According to the complementary studies carried out, **No** presence of peat soils or existence of High Conservation Values (HCV's) was identified. On figures 9 and 10, the potential planting and areas to be avoid can be recognized; these areas to be avoid consist on degraded forest and will only be for conservation.

Table 4. Summary of carbon stock identify, HCV's and pet land.

Land Cover Type	Total Area (ha)	Total Development Area (ha)	Total Carbon (tC) Stocked	Total Carbon Dioxide (tCO_2e) stocked	Total Carbon Sinks (tCO_2e)	tCO_2e/yr. (including land cleared for other use)
Agricultural	199.5671	199.5671	1,696.32	6,219.89	--	248.82
Cattle Land	22.1741	22.1741	110.87	406.53	--	16.26
Bushes	183.8942	183.8942	8,458.94	31,016.40	--	1240.70
Degraded Forest	2.7633	--	4.14	--	15.20	--
HCV's	0	Not Identified	**--**	--	--	0
Peat Land	0	Not Identified	--	--	--	0
Total	**408.40**	**405.64**	**10,270.27**	**37,642.82**	**15.20**	**1505.78**

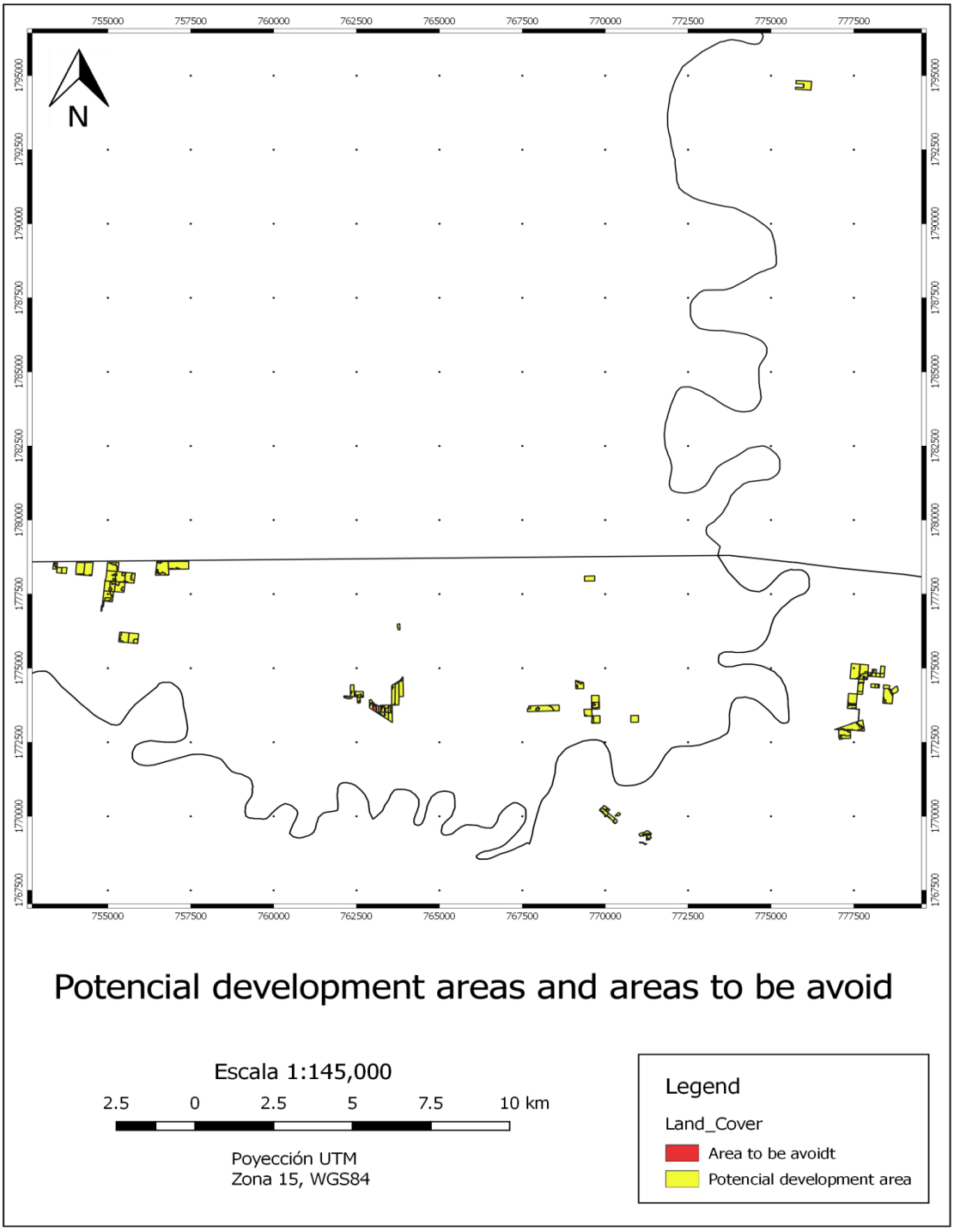
Source: Green Development based on New Development GHG Calculator RSPO, 2017

Figura 9. Land Cover Map for New Plantings.



Source: Green Development, 2017

Figure 10. Areas to be Avoid and Potential Development Areas Map



Source: Green Development, 2017

4.5 FPIC Process

Following the guidelines of FPIC flowchart. (Guide Consent Free, Prior and Informed for members of the RSPO, Nov. 2015) , we conclude that there is no need for FPIC, however the process of dissemination of the project was developed so that communities are informed beforehand of the sowings.

The activities performed during the process were:

1) Prior to the meeting:
   a. Meeting Request (according procedure Department of Foreign Community), all community members were invited to participate in meetings. The invitation was made through the authority of the community as mayor or COCODE.

2) On the day of the meeting:

   a. Signature of assistants.

   b. Focus Group with communities, where they explained the purpose of the meeting, it was explained the concept of RSPO of " Free, Prior and Informed Consent " in the process of "New Plantings Development", talked about the private property and named what the plots that belong to the company, where oil palm will be planted.

   It was explained that the company will work and pay wages according to law, and that forests will be respected because it is forbidden to cut trees.

   A translator was used to Q'eqchi language in some communities so that everyone could understand and communicate their ideas.

   The community expressed that they have no problem with the new plantings, as the company has the liberty to plant on plots that they owned, and planting will benefit them with work.

   c. Development of participatory map: After the explanation of private property, people of the communities agree to Palmas del Ixcán be planted in plots that belong to them and marked on a map plots that belong to the company Palmas del Ixcán, and what is the area that belongs to the community.

   d. Preparation, reading and signing of the minutes: The authorities of the communities prepared an act in their respective books of minutes of the communities, it was read and all agreed, the minutes were signed.

5. Study Results

5.1 HCV

National/regional context

The region where the properties destined for new plantations are located is known as the transversal Strip of the North, created in the 1960s for economic development through massive agricultural colonization. The granting of lands to "militants" and investors close to the government, promoted the exploitation of natural resources, severely impacting the forests. The natural areas were cleared for the introduction to extensive livestock and the use of precious woods. The results of the exploitation of natural resources are still visible in the region, where there is a high level of fragmentation of secondary forests. Many areas that were once cattle pastures, are now abandoned and present plant regeneration, in some cases in early stages with low shrubbery and in other tall shrubs and trees (late secondary forest).

Regarding protected areas, in the region there are some areas that are declared under different categories, according to the Law of Protected Areas, decree 4-89 (Figure 3.1). These protected areas have been invaded mostly, deforested and lost biodiversity, especially the San Román Biological Reserve (RBSR), which is part of the Guatemalan System of Protected Areas (SIGAP), located in Sayaxché, Petén. The Private Natural Reserves (RPN) is a category of protected areas of the SIGAP, of private possession (non-state or communal), which have conservation objectives. To the south of the region where the properties for new plantations are located, there is the RPN Chajumpec and the RPN Entre Ríos. This category of conservation can be a strategy to conserve the few natural resources and biodiversity of the region. Even the RBSR has been severely deforested that the primary forests that once had been intervened. All protected areas are totally outside the area of influence of the properties of new plantations.

According to the classification of life zones of Guatemala (De la Cruz 1983) based on the Holdridge method, the assessed properties at the region level are within the life zone called “very humid subtropical warm forest” (bh-S (c)) (Figure 3.2) and in the ecoregion of “humid forests of Petén-Veracruz”. The natural vegetation is dominated mainly by the species: San Juan (*Vochysia guatemalensis*), corozo (*Attalea cohune*), guarumo (*Cecropia* spp.), Ramón (*Brosimum alicastrum),*ceiba (*Ceiba pentandra*), and others (De la Cruz 1982). According to the information from Landscapes of Intact Forests (PBI) (Patapov et al., 2008) in the region where the evaluated properties are located, there is no PBI. The closest forest mass that is classified as PBI is the coverage of Montes Azules National Park, in Mexico, approximately 30 km from the new plantations. As for archaeological sites, the region is not characterized by having these sites. Figure 3.3 shows the general archeology map of the region. Three archaeological sites are observed in the region at a considerable distance from the areas under evaluation.

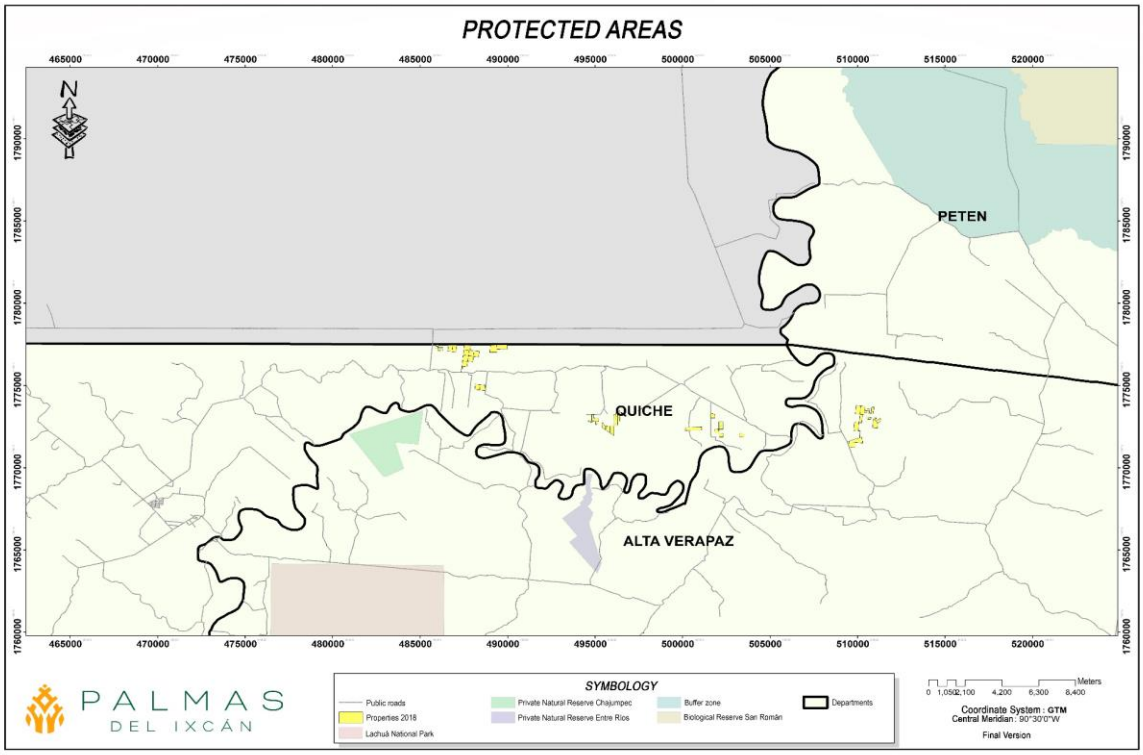


Figure 3.1. Protected areas near the proposed new plantation areas

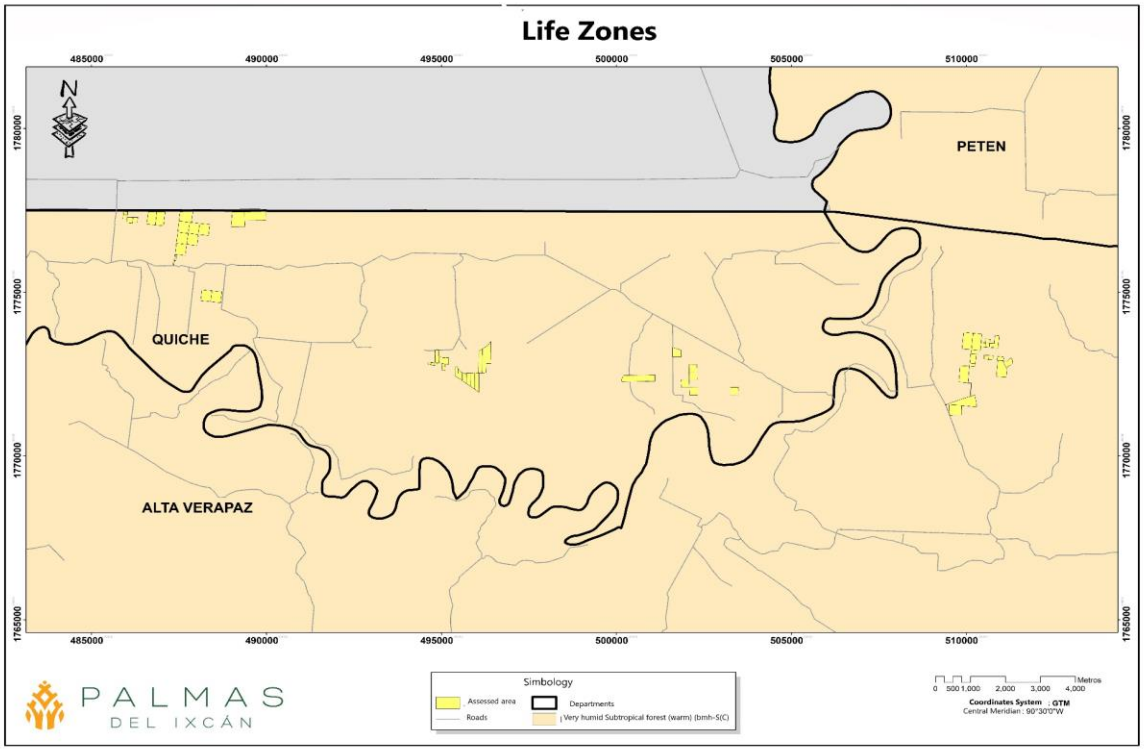


Figure 3.2. Life zone in the region where new plantation areas are located.

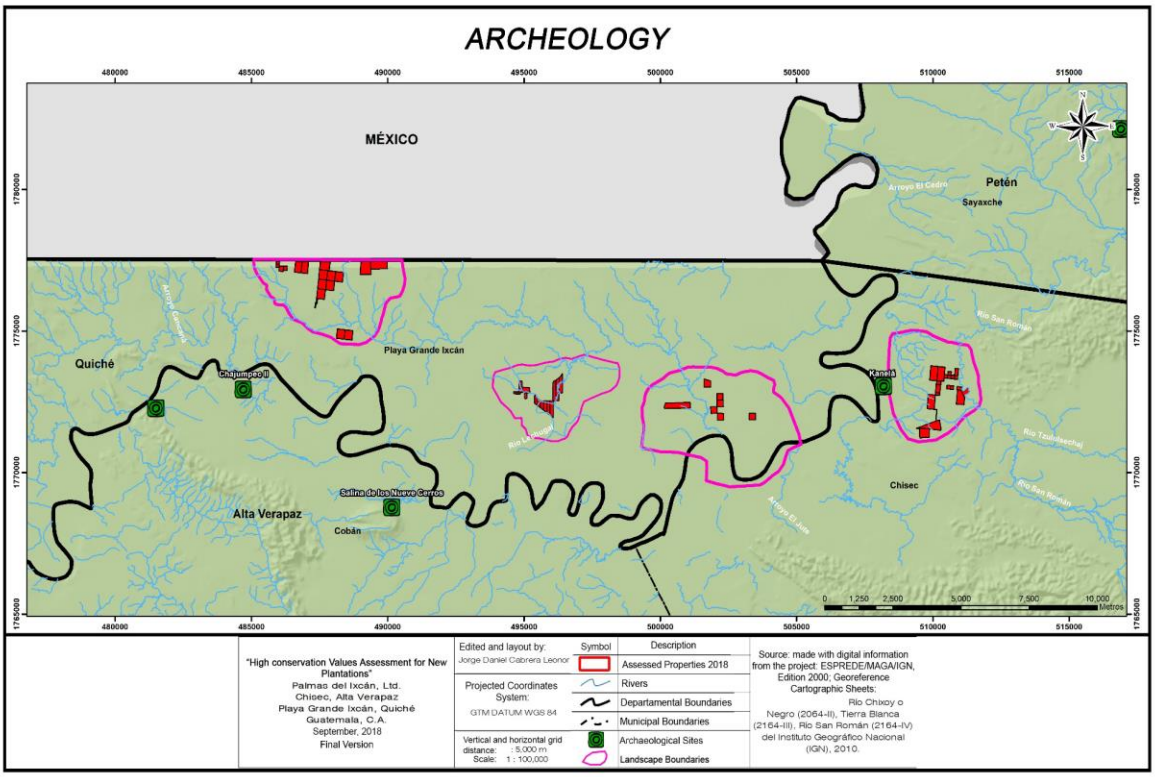


Figure 3.3. Archeological sites in the region where new plantation areas are located.

Landscape context

The boundaries of the wider landscape of the assessed properties were defined based on the following criteria: i) nearby communities that may be affected by the development of these properties, ii) presence of nearby water resources (rivers, lagoons, births) of potential use of communities (especially downstream) or that may be affected by development, iii) coverage of land with potential values (forests, wetlands, pastures) including HCVs identified in the evaluation of existing plantations that may be affected by development, and iv) administrative boundaries since there are properties that are on the border with Mexico.

Some new plantation properties are in the vicinity or at short distances from each other, so they were grouped by proximity to define the wider landscape of these. The Figures 3.4. to 3.7 show the maps with the clusters of properties and their wider landscape, which in total are four wider landscapes. Altogether, the area of the wider landscapes is of 4883,2023 ha, which is the area assessed for the identification of HCV. The management areas of the identified HCVs, however, correspond only to properties intended for new plantations (described in the Management and Monitoring section). It is important to clarify that in the 2015 assessment despite the fact that HCV 5 was identified in the municipalities where the properties of new plantations of this evaluation are located, it is not clear in that report about the locations of the HCVs and their management areas were not identified or mapped its, therefore, could not be represented in the maps of this report.

The descriptions of the four wider landscapes in climatic, socioeconomic, edaphic, land use, archaeological, and coverage aspects are very similar because they are in a homogeneous region. In cases where there are resources or values that stand out in each larger landscape, they are described in greater detail considering their relevance or uniqueness.

For the properties grouped as **Landscape 1**, the delimitation of the wider landscape considered the presence of the rivers that are at the extreme west and east of this cluster, as well as the vegetation cover that may have some potential conservation value; to the north of the properties the landscape with the Mexican border was limited. Within this landscape were included two communities that are the actors that may be affected by the development, being these communities of Los Olivos and Sonora. Adjacent to the properties under evaluation, there are oil palm areas of the Company that have already been assessed in 2015 (Figure 3.4).

For **Landscape 2**, the boundaries were delimited by the forest cover and the presence of flood zones in the area, as well as the Lechugal river that crosses the properties destined for new plantations.

The Esmeralda community, north of the properties under evaluation, was included as the actors involved or that may be affected by the development. In this wider landscape there is presence of palm plantations of the Company already evaluated in the 2015 HCV (Figure 3.5).

For **Landscape 3**, the presence of the rivers that are present in the vicinity of the properties was considered, as well as some flood zones in the east of the cluster. The El Prado community is populated close to these properties and may be affected by the development of the plantations. Within this landscape there is presence of palm oil plantations of the Company already evaluated (Figure 3.6).

For **Landscape 4**, the wider landscape was delimited by the presence of the San Román River, including it within the area to be assessed, as well as the land covarage where forest remnants are present. Near this area there are no communities that may be affected by the development of these properties. In this landscape there are no oil palm plantations of the Company; there is no area previously assessed for HCV (Figure 3.7).

Note that the official maps of the country regarding land coverage, the term "non-forest" is used referring to the coverage that does not classify as forests, but to other uses (agriculture, industry, urbanization and even grasslands). This map of coverage for the No Forest areas considered the information generated by the Ministry of Agriculture, Livestock and Food to generate the land use layer (INAB-CONAP, 2015).

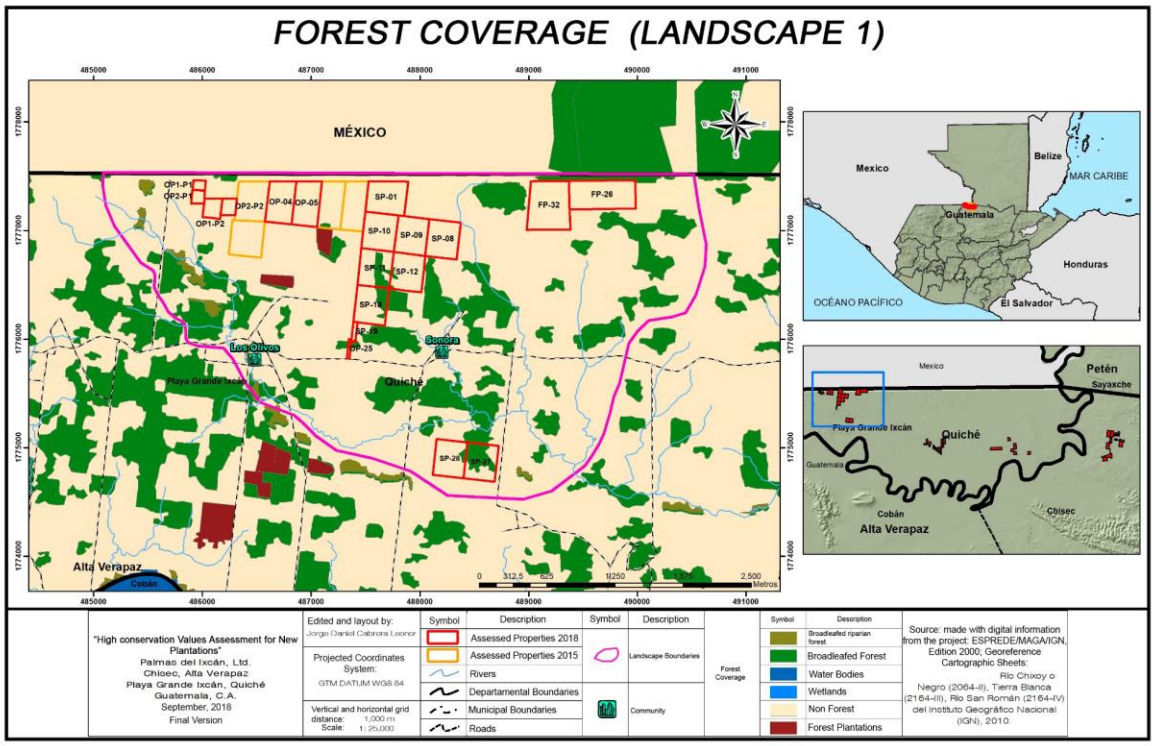


Figure 3.4. Wider lanscape 1 boundaries and land cover.

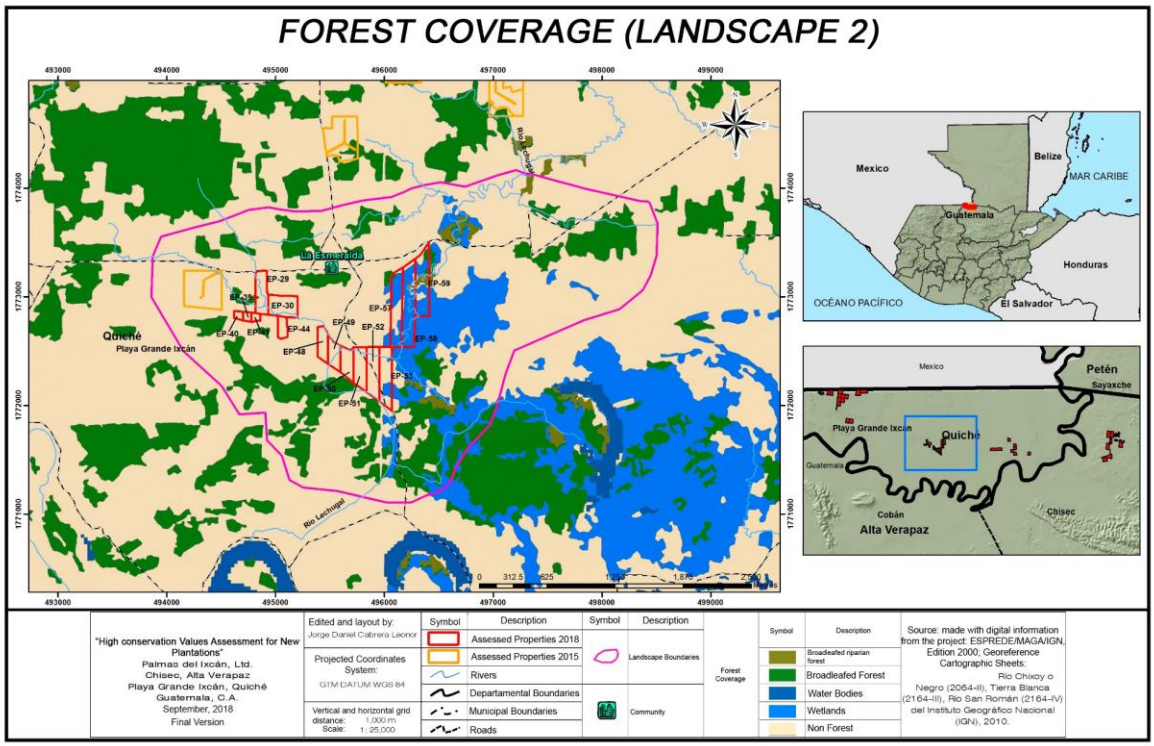


Figure 3.5. Wider lanscape 2 boundaries and land cover.

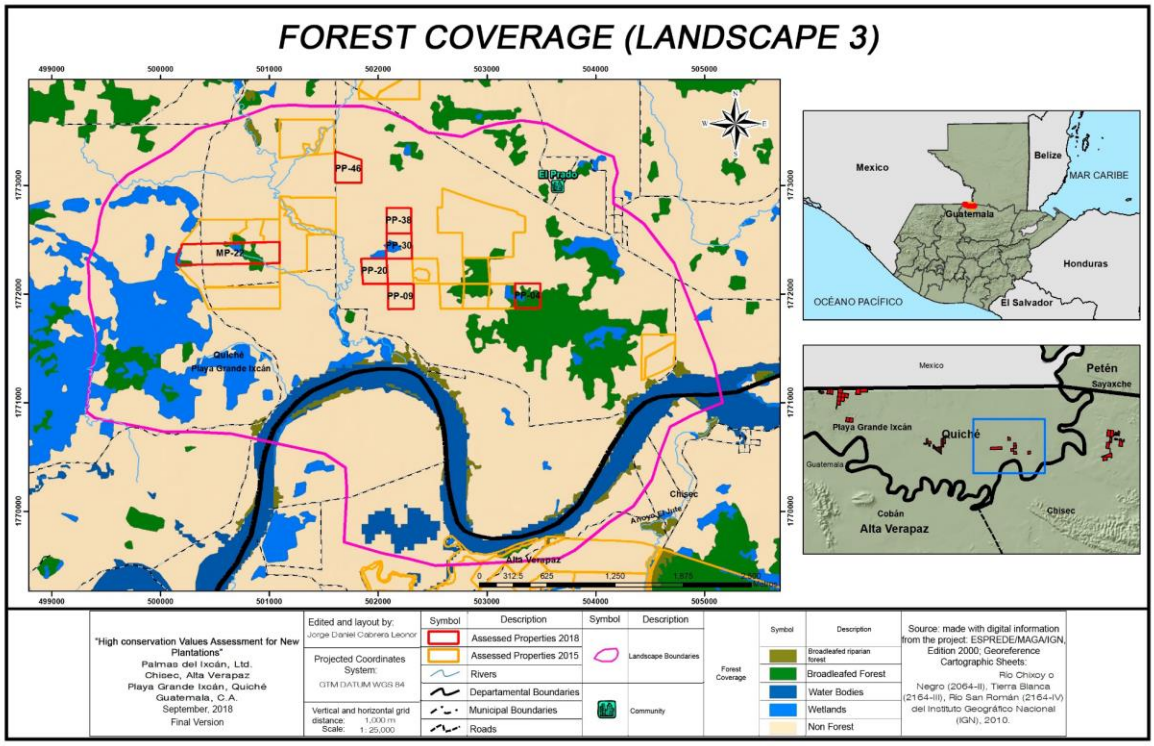


Figure 3.6. Wider lanscape 3 boundaries and land cover.

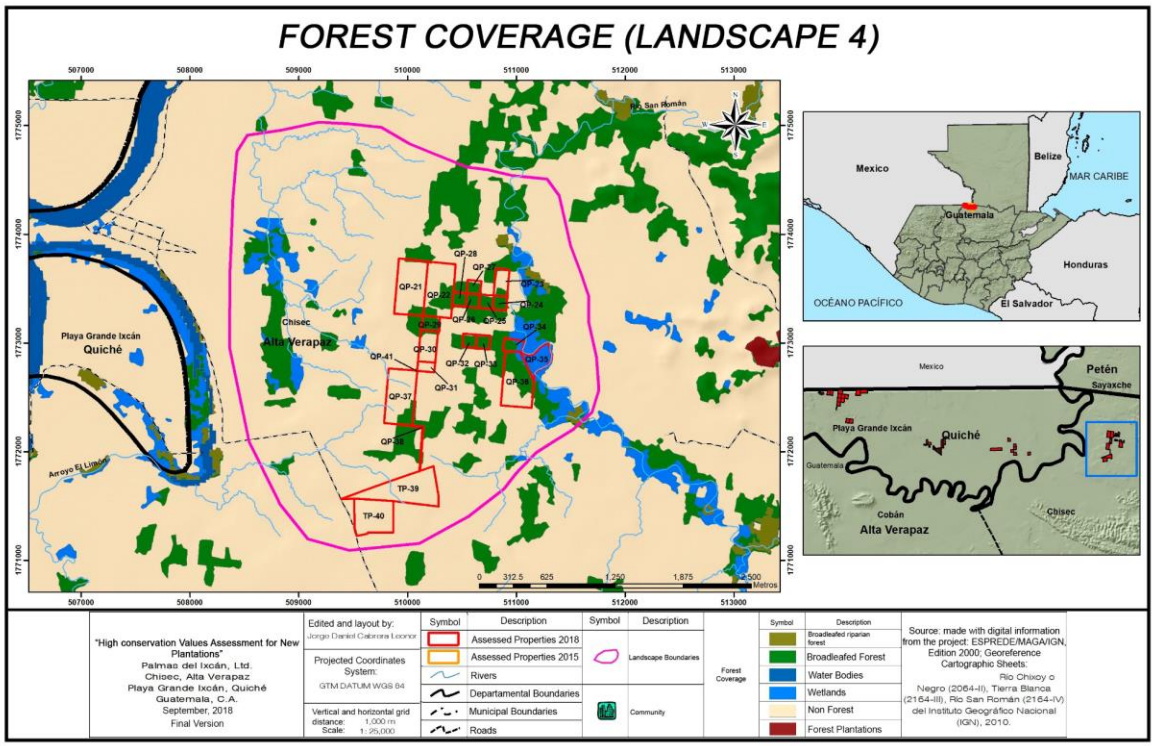


Figure 3.7. Wider lanscape 4 boundaries and land cover.

Land Covarage / Land Use

The history of land use in the municipalities of Ixcán and Chisec is critical to understand the current state of this. These areas were part of an initiative of colonization and economic development in the counterrevolution of 1854. In 1954 the National Council for Economic Planning encouraged massive agrarian colonization and the promotion of industrial nuclei for economic decentralization in this area (Solano 2012). The lands of the Ixcán were uncultivated lands or hunting areas for the Ixil (indigenous ethnic group), which were given by the government (1873-1885) to "militiamen" for participating in the war of 1871. This opened the doors for exploitation of natural resources in the 1970s. At this time, the deterioration of the natural coverage of Ixcán and other municipalities began (Solano 2012). This deterioration is currently evident, with a high level of forest fragmentation. The remaining forests in the assessed landscapes are secondary broadleaf of lowlands (up to 600 meters above sea level) that are critical habitat for threatened and endemic species (Melgar 2003).

Landscape 1. The land use is dominated by the agriculture of basic grains, pastures and abandoned shrublands, pastures for livestock (Figure 3.8). There is also in this area palm oil plantations some are property of the Company and some are not. According to the 2015 HCV assessment (Bioterra 2015) there are no HCV management areas in this wider landscape. The landscape itself has a high degree of fragmentation of natural areas. In the west and south of this landscape the Lechugal River influences. This river is devoid of cover in most of its channel, in some areas it has shrubbery in the riparian zone.

Landscape 2. The dominant use is annual agriculture, low shrub vegetation and secondary forest, which is evident that the area has a lot of pressure for the extraction of natural resources (Figure 3.9). In the east of the landscape there are flood zones that are influenced by the Lechugal River, which are even inside some properties that are destined for new plantations. According to information from settlers, this area remains flooded in the rainy season, in the dry season the land only remains humid. Within the landscape there are some palm oil areas of the Company that have been evaluated for AVC before. According to this assessment (Bioterra 2015) there are no HCV management areas in the this landscape.

Landscape 3. The agricultural use dominates, followed by pastures and oil palm cultivation (Figure 3.10). Within this landscape there are palm oil plantations of the Company that were previously evaluated (Bioterra, 2015). In that HCV assessment, rivers were identified as HCV 5 under the precautionary principle, some within the current landscape. However, in that assessment's report, no management areas were defined or mapped for HCV 5, hence cannot be presented in the land use maps. However, the results of that evaluation were considered for the identification of values for the properties under this study. To the south of this landscape is the Chixoy River, which continues its course to the north to flow into the Salinas River.

Landscape 4: The land use is dominated by annual agriculture, pastures and low shrub vegetation (guamiles-scrub) (Figure 3.11). With less presence, there are patches of secondary forests that show extraction of wood and firewood. In a small portion to the south of the landscape there is presence of oil palm from another company. To the east of the landscape runs the San Román River. In the area were the properties QP-35 and QP-34 and the San Román River meet, the area tends to flood, due to the fact that the river grows during the rainy season. In most of the river's path, the riparian zone is devoid of coverage, areas with riparian forest are scarce or nonexistent. In this landscape, there is no prior assessment of HCV for Company properties.

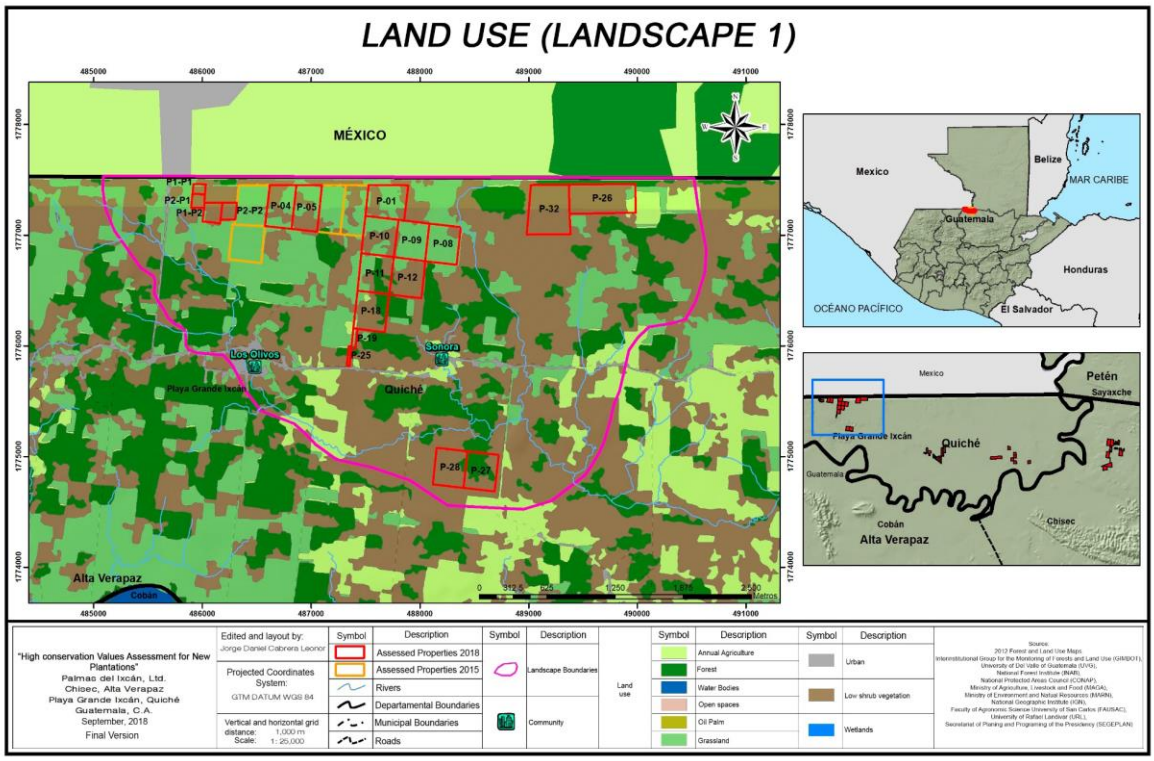


Figure 3.8. Land use for Landscape 1.

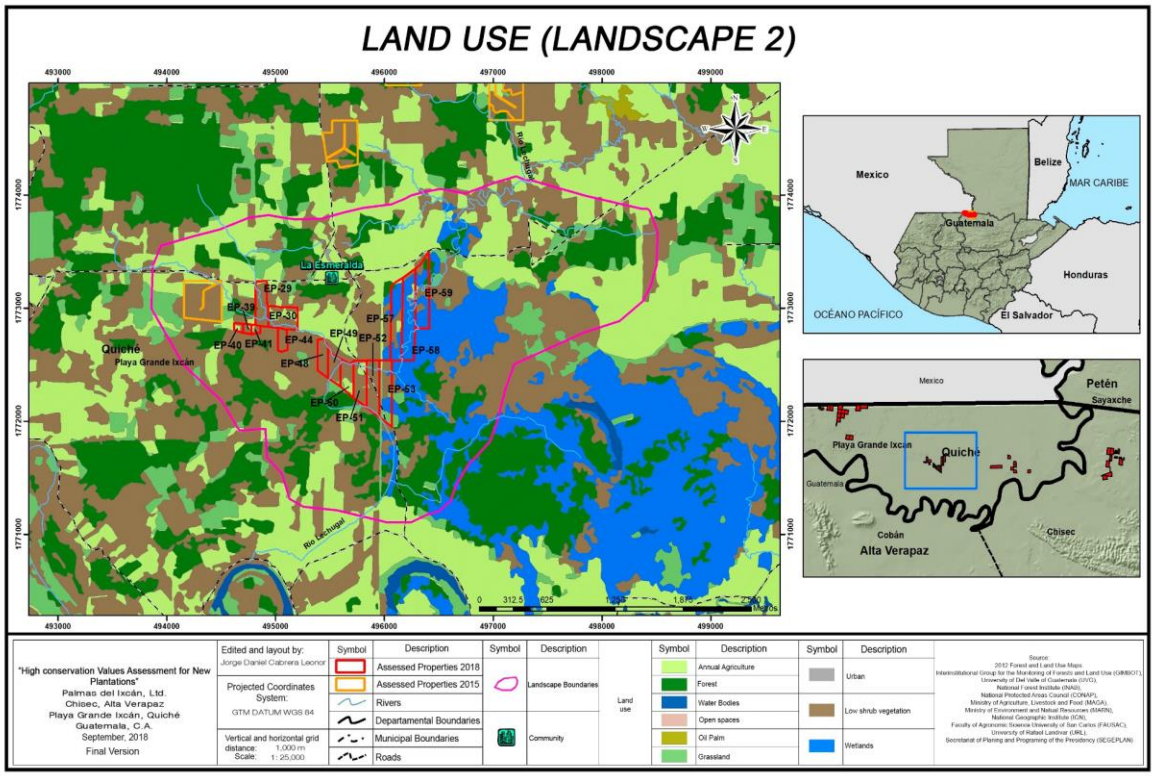


Figure 3.9. Land use for Landscape 2.

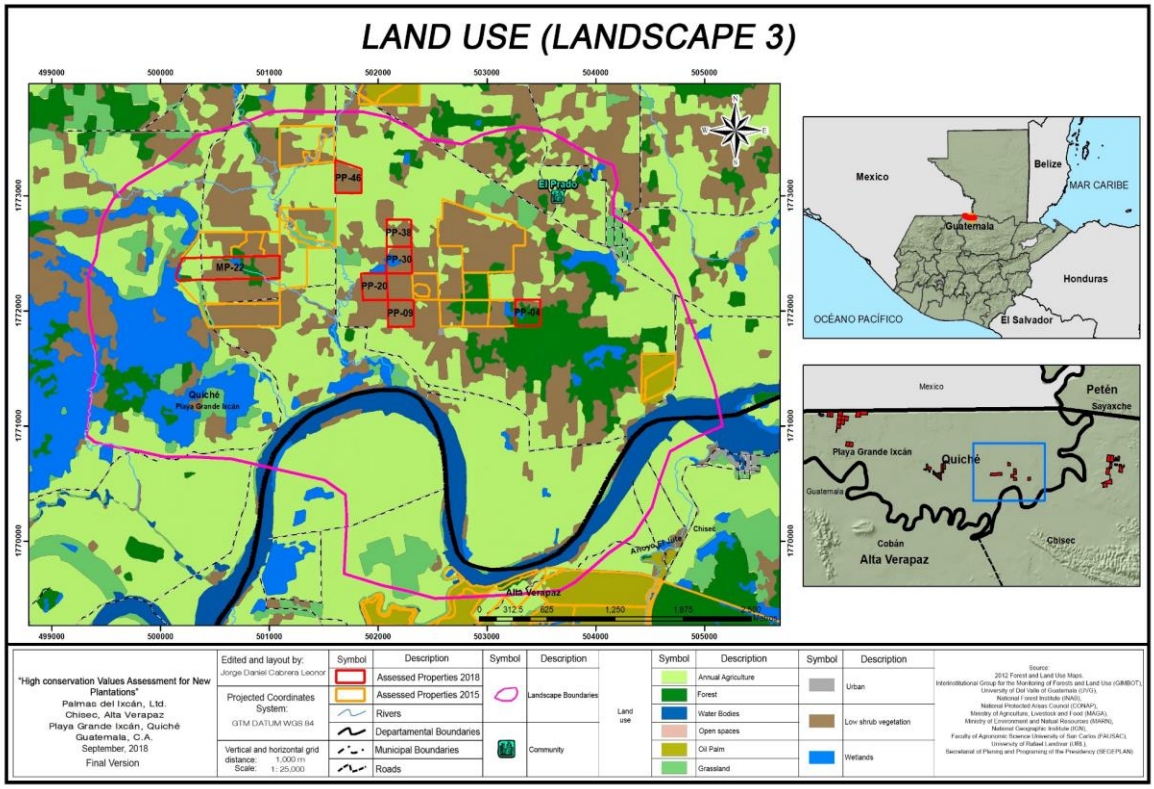


Figure 3.10. Land use for Landscape 3.

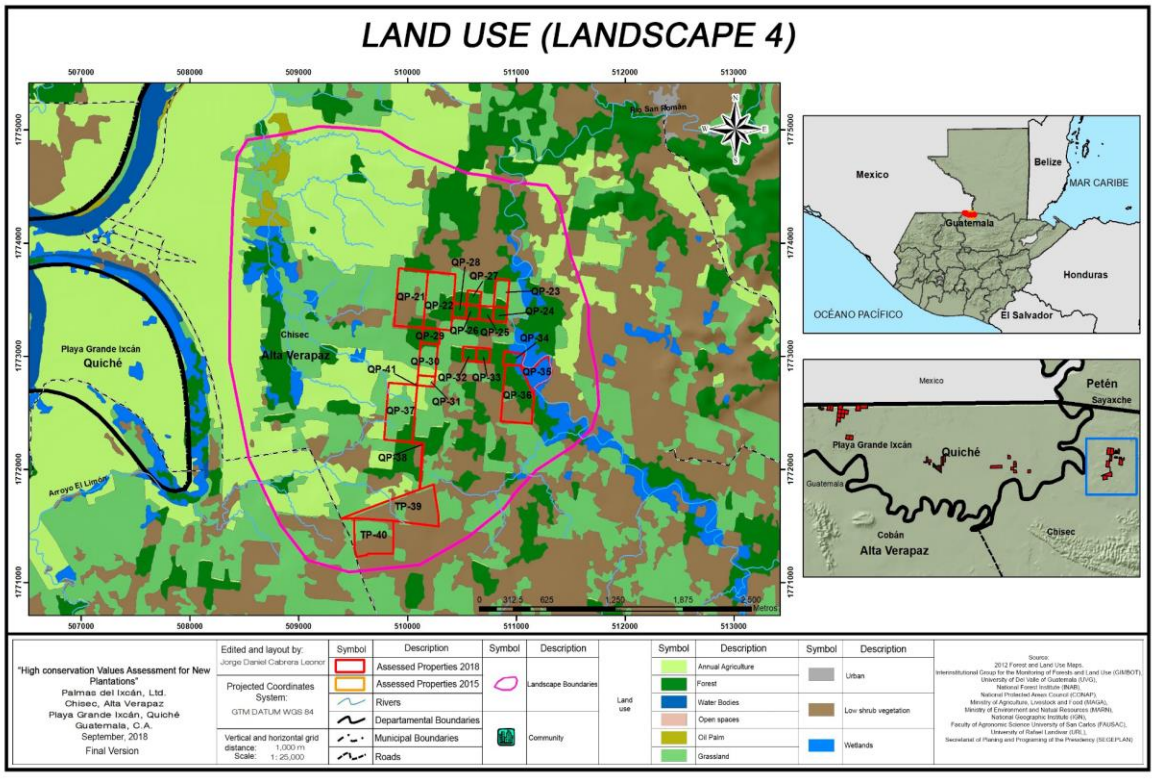


Figure 3.11. Land use for Landscape 4.

Biodiversity and conservation (protected areas, key biodiversity areas)

In the four wider landscapes there are no protected areas (PA) (Figure 3.1), key biodiversity areas (KBA), areas of the alliance of zero extinction (ZAE) or important bird areas (IBA). In terms of species richness, a rapid ecological assessment (REA) was carried out in the area by the lead assessor (López, 2015), for the area assessed in 2015. No biological information or at least, no publications have been generated in the area. Information generated in the National Park of Lachúa was consulted due to lack of local information. Note that this park is still very well preserved and is beyond the scope of this evaluation, so the information was used merely as a reference. According to consultations with experts, the area under evaluation is quite degraded, but maintains the functionality of safeguarding strategic species and forests (Van Tyulen, pers. com, 2018).

There is a presence of timber RTE species that are strongly threatened, such as *Dalbergia stevensonii* Standl., *Swietenia macrophylla* King and *Ceiba pentandra* (L) Gaertn., These are mature forest species and are currently listed on threatened species (Hernández, pers. com, 2018). We sampled sites with potential for the presence of RTE species, as well as sites considered important due to the coverage they have (Figure 2.1 to 2.4). The references for identification of RTE species were the List of Endangered Species (LEA) of the National Council of Protected Areas (CONAP) (CONAP, 2009), the list of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CONAP, 2001) and the red list of the International Union for the Conservation of Nature (IUCN, 2017), as well as the Law on Protected Areas (decree 4-86).

Climate and geography

The climate and geography of the four wider landscapes are similar, so the description of this section is in general for the four landscapes. According to the climate classification system (Thornthwaite 1948), the area under study presents a warm climate with a mild and humid winter without a well defined dry season with natural forest vegetation. The rainfall in the evaluated area has an annual average of 2,500 mm. The maximum temperatures oscillate between 28 ° to 35 ° C and present low temperatures on average between 14 ° to 20 ° C. There are some formations of karstic hills that shelter vegetation representative of the area. The morphography of the area has a flat to slightly concave topography, with a slope of less than 1%, the elevations vary only from 120 to 130 meters above sea level.

Social and cultural values

In Landscape 1, there are two communities, Los Olivos and Sonora, which are considered relevant and which could be affected by the development of the new plantations, as well as the natural orcultural resources they potentially have. For Landscape 2, the Esmeralda community was identified; for Landscape 3, the El Prado community was identified; in Landscape 4 it lacks communities within its wider landscape. Figures 2.5 and 2.6 show the location of each community within the wider landscapes.

Demographic data of the communities are detailed in Table 3.1.

Table 3.1. Communities inside the wider landscapes of the new plantation areas.

Community	Population 2002*	Population Projection 2016	Coordinates UTM WGS 84 15Q	
			X	Y
Los Olivos	484	903	753952.2	1776901.62
Sonora	278	518	755672.68	1776992.39
La Esmeralda	333	621	763022.11	1774469
El Prado	269	502	771162	1774290
Total	**1364**	**2544**		

Source: INE, 2003.

The population gender ratio 50%-50%, in relation to their ethnic origin, 99% is indigenous population which mostly belongs to the Q'eqchi' ethnic group and 1% is non-indigenous (INE, 2003).

Each community addressed is represented by the Community Development Council (COCODE), which are the community organizational structures by law and represent the interests of the population of their respective communities. COCODEs are the main line of access for the development of any activity in the communities. Economic activities include livestock, agriculture and the sale of labor to agricultural companies.

Regarding the cultural aspect, there are no records of archaeological sites in the wider landscapes identified and evaluated, referring to the archaeological map (Figure 3.3). The nearest site is the Kanela site, a secondary center that is in the vicinity of the San Román River (Ponciano, pers. Com, 2018). According to the answers of participants of the consultation workshops, they do not identify sacred sites or archaeological in their communities and they do not know if there are such sites within the areas destined for new plantations, since they mention that they are private property and that access is restricted. There is no mention of ceremonial sites registered or designated by the communities. There are no records of sites or areas declared as cultural heritage declared by the country or UNESCO (http://whc.unesco.org/en/statesparties/gt).

Stakeholders

For the identification of HCV 4, 5 and 6 communities identified within the four wider landscapes were approached; the landscapes were delimited by physical, administrative and coverage barriers (Table 2.2 and Figure 2.5 and 2.6). The results obtained by the previous study of HCV (Bioterra, 2015) as a secondary source were considered, in some cases the key actors interviewed in that assessment coincide or are very close to the wider landscapes defined for the current assessment. In the 2015 assessment HCV 5 was identified in these areas, however, in that report it is not clear the locations of these values, nor were they mapped, it only mentions that HCV 5 corresponds to the rivers in the area.

What is relevant is the homogeneity of the region where both existing and new plantations are located, which allows us to consider the results of the previous evaluation, albeit in a general way. Other secondary sources include the Social Impact Study (Centrarse, 2017), and the Initial Environmental Assessment (Ambiente y Desarrollo, 2015) and Socioeconomic Study of the communities in the area of influence of the Palmas del Ixcán project (Ambiente y Desarrollo, 2008).

For archeology topics (HCV 6) the layer of archaeological sites nationwide was reviewed. We investigated scientific documents about potential archaeological sites in the area under evaluation and consulted an expert on the potential cultural value of the area (interview with Ponciano, 2018, archaeologist). Most of the communities in the area of interest of this study have already been addressed on several occasions, including some community members have expressed that they "feel overwhelmed" by the numerous studies and their intervention required. Therefore, of the six communities identified, four were directly intervened by this study and the rest was worked with the information collected in the studies. The communities intervened in situ were: Los Olivos, Sonora, Esmeralda and El Prado.

Table 2.2. Population centers in the area of direct influence of the new plantation areas assessed

Community	Population in 2002*	Projected population in 2016	Coordinates (UTM WGS 84 15Q)	
			X	Y
Los Olivos	484	903	753952.2	1776901.62
Sonora	278	518	755672.68	1776992.39
La Esmeralda	333	621	763022.11	1774469
El Prado	269	502	771162	1774290
Total	**1364**	**2544**		

**Source: Instituto Nacional de Estadística (INE, National Institute of Statistics) 2003*

Participatory workshops were held in each of the four communities in order to identify whether the socially relevant HCVs were present from direct sources. These activities were developed in coordination with local Community Development Councils (COCODEs), which are the official community sociopolitical organizations derived from the governance decentralization laws of Guatemala.

These groups are comprised of community leaders who watch over community interests with respect to governmental and private sector activities. For example, COCODEs grant authorization to carry out activities such as the participatory workshops employed for this study, they also decide if only COCODE representatives participate in such events or whether other community members should be involved. This may exclude minority groups or key actors within the community and relevant to the evaluation. However, the assessing team respected these decisions. The workshops were based on thematic interests, in this case the identification of specific potential HCVs 4, 5, and 6, based on key questions about these components under a defined agenda.

Interviews to 22 key actors of the wider landscapes were made, including two experts in forests and ecosystems (they work in the INAB and Botanical Garden) and an expert in archaeology (works in Tikal National Park) whose characteristics are listed in the following table:

Table 2.3. Sectors and institutions of the interviewed key actors

Sector	Institution
Government	Lachuá National Park (INAB)
	Strategic Ecosystems Unit (INAB)
	Departmental Directorate of Education (MINEDUC)
	Mediterranean Fly Eradication Program (MOSCAMED)
	Vectors; Ministry of Public Health and Social Assistance
	Teachers of educational institutions
	Technical Unit of the Tikal National Park
Local Government	Mayor
	Councilor in charge of the Environment Commission
	Directorate of Municipal Forest Office
Civil Society	Botanical garden of the University of San Carlos
	COCODES Presidents
	Protestant leaders
	Small producers

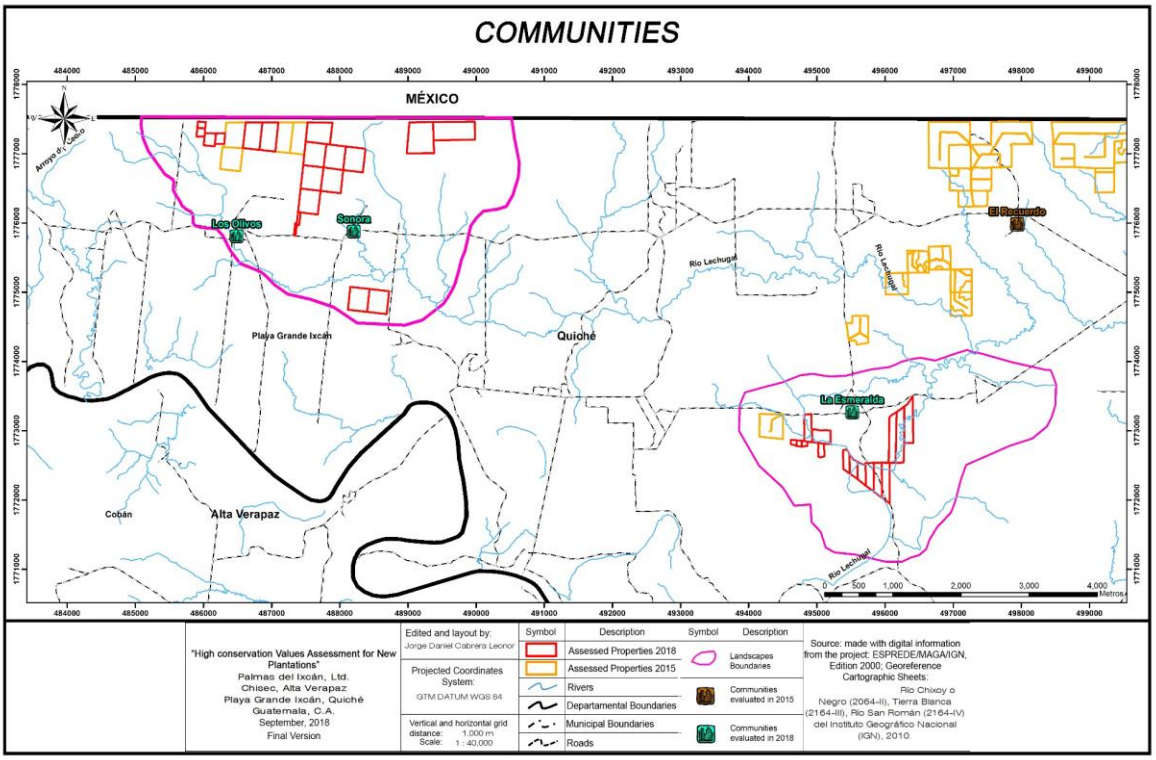


Figure 2.5. Communities in wider landscapes 1 and 2.

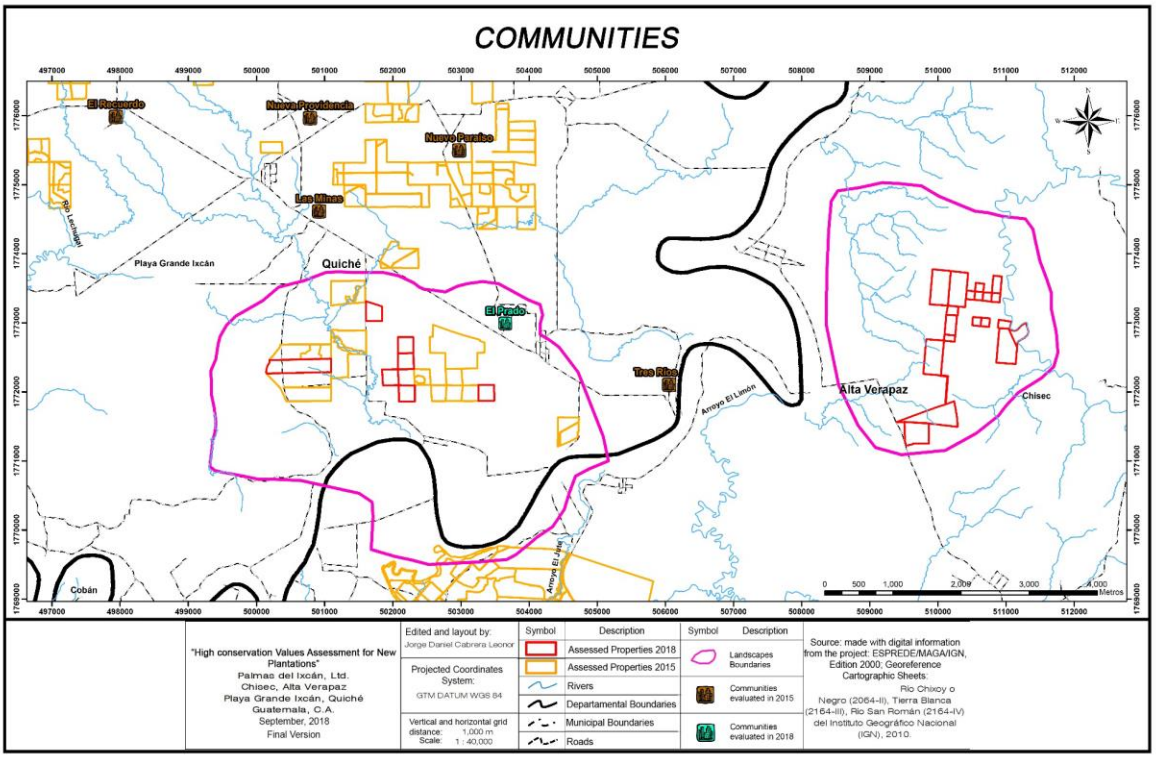


Figure 2.6. Communities in wider landscapes 3 and 4.

Public consultation and stakeholder interviews

In the social context and organization of the communities of the country, the community development councils (COCODE) are the representatives of the inhabitants of the communities. It is through these structures that invitations and calls for events or approaches are made. This presented some limitations in the consultations since the COCODE decides whether there is a broad participation of the community members, or a group chosen by them. This could leave out the participation of some key actor, minority groups or equal participation. On a second occasion, interviews were also carried out with key actors that intervene in the wider landscapes, even if they do not have a physical presence in them (e.g. Strategic Forests Ecosystems Unit of INAB).

These key actors include experts in environmental issues (ecosystems) (Van Tyulen and Hernández) and cultural (archeology-anthropology) (Ponciano). In the wider landscapes and even in the region, nonprofit organizations of an environmental nature are absent; in the review of actors of the 2015 evaluation they were not identified either. NGOs of a social nature are not present in these landscapes, however, the organization Community Association of Health Services (ACCS), which works at a regional level and located in the municipal capital of Ixcán, was identified. The interview with the representative was not finalized and it is considered important to follow up on this consultation, which is why it will be recommended in the management and monitoring section for measures to do so.

Both workshops and interviews included key questions for the identification of HCVs (of the six categories), as well as questions to express their concerns about the establishment of new oil palm

plantations and recommendations to the Company. The workshops were developed in the communities identified for the four broader landscapes (Table 3.6).

Table 3.6. HCV identification workshops per community

Community	Date	Number of Participants
El Prado	15/May/2017	09
Los Olivos	16/ May /2017	07
Sonora	17/ May /2017	04
La Esmeralda	18/ May /2017	20
		40

Interviews with key actors included people from the public and private sectors, with actors from the productive, scientific, administrative, educational and civil society sectors. The interview results of the 2015 HCV assessment coincide in part with those of the present, so they were considered as a reference. The main concerns of the actors interviewed in 2015 was the access to water sources, their contamination by agrochemicals, that is, the concern is focused on water resources in the area. Another issue that was given importance is the felling or removal of forests for the implementation of the crop. They were told that the certification process seeks to develop the crop in a sustainable manner, which includes the conservation of

natural resources under the application of environmental legislation (Bioterra 2015). Similar concerns emerged in the present assessment, which is presented in the following table:

Table 3.7 Summary of interview and consultation with key actors

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
01	Lorenzo Estuardo López López	Small producer of oil palm	Los Olivos community producer	The consequences it could have on resources such as water, because it does not know if there are sources of water within the plantations.	Keep control of the weight of the scale (referring to his fresh fruit bunch). Did not have any other recommendations regarding his concern.	The concern will be considered in the report and for the management measures.
02	Tomás Maquín	Small producer of oil palm	Los Olivos community producer	The palms absorb water from rivers, and worries him that they will dry up.	Take care of water sources and manage them in order to avoid drought.	The message will be transmitted to the company so that they can provide more information about the crop. Measures of conservation of water resources will be considered.
03	Romeo Palacios	Administrator	Lachuá National Park Does not have direct influence in the communities of the wider landscapes	The negative impacts that can derive from deforestation in the new plantations	Conduct an outreach program to advice of the crop, the benefits, objectives, and impacts. Not to interrupt biological corridors. Improve social outreach.	The message will be transmitted to the company so that they can provide more information about the crop. Conservation measures of existing forest remnants and encourage connectivity will be considered.
04	Miguel Tiul	District Coordinator	Vectors / Ministry of Public Health and Social Assistance - Sonora, Esmeralda, Los Olivos, Prado	Loss of areas for corn crops, since the area for this product will be reduced.	The Company should be objective in giving information to the population. Generate more employment.	The concern about food safety will be transmitted to the company and about analyzing the communication strategy that they have to get closer to the population.
05	Carolampio Camposeco	Municipal Councilor, Environment commission	Municipality of Ixcán	The palm harms native forests and water resources. It is not prudent. Drainages divert the community's water supply (Sonora). It divides the people, generates fly pest. It affects cultural and spiritual aspects. North of Sonora, some plots had streets that people used to transit, which is restricted now. Water simples indicate that the rivers are contaminated.	Do not continue to intervene in the area or diversify crops or even integrate forest plantations.	The Company will be suggested to approach the municipality to address these concerns. He was told that there was no answer to these issues, but that they would certainly be taken into account in the management recommendations.
06	Joel García	Technician	MOSCAMED Ixcán communities	No mature forests are in the area. Without forests, there is no fauna.	The Company should allocate reforestation areas. Raise awareness among the population so that they know the benefits of palm plantations through a publicity campaign.	It will be recommended in measures of management of the identified values the recovery of these. In addition, he was informed that there are regulations that the Company must comply with and that it contemplates forest management measures.

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
07	Rosendo Batzin Yool	Director	MINEDUC Sonora, Esmeralda, Los Olivos, Prado	The main concern is that people do not value their land and end up selling them.	The company should protect forests and guide people to resolve social conflicts.	It will be recommended in measures of management of the identified values the recovery of the same. In addition, he was informed that there are regulations that the Company must comply with and that it contemplates forest management measures.
08	Raúl Gutiérrez	Mayor	Municpality of Ixcan	He is concerned about forests, water sources, the proliferation of flies, the change in land use.	Find a balance between the interests of the Company and the expectations of the communities. Create sustainable forests so that there is more oxygen, improve the environment, and basins and micro-basins are conserved. The Company must be involved with the culture of the communities. Socialize projects, take into account community authorities, support education, implement rural health kits, establish a better relationship with the municipality, seek alliances to execute projects.	The Company will be suggested to approach the municipality to address these concerns. He was told that there was no answer to these issues, but that they would certainly be taken into account in the management recommendations.

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
09	Bryan Soberanis	Forest technician	Municipality of Ixcan	Rivalry between people for access to employment within the Company. This problem is due to the selectivity of contractors.	Protection of the remnant of forests. Use or implement forest reserves and strengthen coexistence between communities.	The recommendations for the potential identified values will be taken into account. The concern of hiring will be transmitted to the company.
10	Alejandro Cuc Cucul	Auxiliary Major and COCODE president	Santa Cruz COCODE	Deterioration of natural resources in the plantation areas, such as rivers, springs, forests. Flies propagate with compost applications	Take care of the natural resources found within the plantations. Be careful to control the fly plague when compost applications are made, by means of traps.	The recommendations for the potential identified values will be taken into account. The Company will be recommended to make approaches to discuss crop management concerns.
11	Geremías Chen	Auxiliary Major and COCODE president	Las Minas COCODE	Does not have concerns, but wishes job opportunities continue.	Invest in community projects and help community workers.	The Company will be posted on his recommendations.
12	César Manuel Pérez Coy	COCODE President	La Esmeralda community	The Company's trucks go through a community road and deteriorate it; he wants maintenance. Flood contamination in places near the pipeline that supplies the community.	Leave 5 meters distance between the palm plantations and the basic grain crops of nearby plots, because the shade harms crops (corn, beans) and no longer produce. Protect a stream 8 meters wide, because there they do fishing for family consumption.	Concerns about the management and operations of the Company will be transmitted to the Company, recommending an approach to discuss these issues. It was mentioned that a stream conservation recommendation will be taken into account, that there is even a national regulation

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
					Support the school in the construction of a new roof, because two years ago the strong winds destroyed it. Support in the construction of a communal room for meetings.	that protects up to 25 m of the riparian zones.
13	Marcelino Cac Caal	Directive of COCODE	La Esmeralda community	Road maintenance due to truck transit near the community.	Leave 5 meters distance between the palm plantations and the basic grain crops of nearby plots, because the shade harms crops (corn, beans) and no longer produce. Protect a stream 8 meters wide, because there they do fishing for family consumption. Support the school in the construction of a new roof, because two years ago the strong winds destroyed it. Support in the construction of a communal room for meetings.	Concerns about the management and operations of the Company will be transmitted to the Company, recommending an approach to discuss these issues. It was mentioned that a stream conservation recommendation will be taken into account, that there is even a national regulation that protects up to 25 m of the riparian zones.
14	José Chen Pop	Teacher	School at El Prado and Las Minas	It harms nature and alters the climate. He is also concerned about the crops in the dry season and the pollution caused by bad odors,	Train staff on the proper handling of chemicals (insecticides, herbicides) and do not throw containers in inappropriate places.	Concerns about the management and operations of the Company will be transmitted to the Company,

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
				due to the compost they apply to the palm plantations.		recommending an approach to discuss these issues.
15	Policarpio Mucu	Auxiliary Mayor and COCODE President	Los Olivos community	Fly pest is generated when compost is applied.	Control this pest and avoid diseases.	Concerns about the management and operations of the Company will be transmitted to the Company, recommending an approach to discuss these issues.
16	Santiago Coc Maquín	Auxiliary Mayor and COCODE President	Las Flores	A problem could arise later, due to the proximity of the river, because the communities wash clothes there.	Protect rivers and their banks, planting trees to promote water catchment.	Information will be considered for the assessment and report.
17	Marcos Ichich Ixim	Auxiliary Mayor and COCODE President	Nuevo Paraíso community	Streams drying out due to contamination of drainages found within palm plantations.	Support the community and workers at the company, giving them fair treatment and daily goals. Drainages dry rivers, do not implement these.	Drainage management recommendations that may affect identified values will be taken into account. It was mentioned that the concern of the labor issue will be transmitted to the Company.
18	Colación Ixim	Directive of COCODE	Nuevo Paraíso community	Dry up of rivers close to the communities.	Leave a 3 m distance between palm and community crops, since shadow harm their crops.	Drainage considerations will be considered in the management measures.
19	Cristobal Choc Coc	Religious leader	Nazareno church,	Half of the village has conflicts related to the palm, mainly due to lack of employment	Conserve streams and rivers that are close to the community.	Drainage management recommendations that may affect identified values will be taken into account. It was

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
			Sonora community		Apoyar el desarrollo de la comunidad.	mentioned that the concern of the labor issue will be transmitted to the Company, since they are the company's own decisions.
20	Sharon Van Tuylen	Director of strategic forest ecosystems	National Forest Institute (INAB)	There is no territorial ordering and there is no designation of areas for crop development (palm) for soil capacity. That the project damages the fragmentation of the forests of the area that are fragile due to the degradation they present.	Create or strengthen corridors, foster neighbors in creating or conserving corridors or restore them. Within the design of plantations take into account forests for connectivity.	The suggested measures for the potential values that are found will be considered. The information provided will be used to justify the presence or absence of values in the evaluation landscapes.
21	María José Hernández	Assistant reasercher	Botanical Garden, University of San Carlos	Loss of biodiversity, forest fragmentation and connectivity, as well as ecosystem services that are lost due to the extension of plantations (forest-fauna interactions). That water resources are harmed in the management of the crop. The lack of connectivity also puts at risk the same viability of the patches since there is no greater mobility of the seed dispersers that maintain the development of these forests.	Consider conservation of water resources, forests and connectivity in the design of plantations. Respect areas destined for conservation. Implement IPM programs, waste management, promote biological corridors and conserve existing ones.	The suggested measures for the potential values that are found will be taken into account. The information provided will be used to justify the presence or absence of values in the evaluation landscapes.

No.	Name	Title/role	Organization/ Social group	Summary of answers and concerns		
				Main concerns	Recommendations	Assessment tema response
22	Erick Manuel Ponciano Alvarado	Coordinator of Technical Unit	Tikal National Park, History and Archeological Institute	That there is little information on archeology in the area, and that the development of the plantations could affect potential remains. Clearing forest areas also affects flora and fauna.	Realization of archaeological studies in the region and forest inventories to characterize the area and evaluate the possibility of doing archaeological rescues. Define conservation areas and their properties.	The company must certainly comply with national legislation, including EIAs that contemplate archaeological characterizations in their areas of intervention. The information provided will be used to identify potential HCVs.

Socialization of results to community leaders

As part of the HCV assessment process, the findings were shared with community leaders from the communities under influence. For these activities, the leaders or representatives of the four communities identified in the AID of the new plantation areas. The six were presented AVC, its definitions and the results of absence of each, according to the information that was compiled with the support of them. In summary, all the participants agreed on the findings, they commented that really in the properties that the Company acquired "there is no greater thing", referring to the AVC explained.

They were also presented with the management measures they will be implementing, especially measures to conserve and protect RAP species. In this sense, representatives of the Esmeralda community mentioned that within a lot destined to new plantation there is a river in where they would like to go fishing. They were told that the company has no hunting policies, no fishing, no

felling, and that included all the resources within its properties. That there are other fishing sites that they could visit, outside their properties; the community members understood and agreed.

No comments or suggestions were given that merited changes or additions in the findings of the six HCV categories, or for management measures that are suggested for other natural resources that despite not being identified as HCV, it is worthwhile to make efforts for its conservation. Others comments and questions arose in these meetings outside the evaluation of HCV; participants they asked when the company would start with the plantations since they need the work and see this as one of the few opportunities that are presented to them. They were told that they must first comply with the NPP and have authorization to start with land preparation activities.

HCV identification summary

The assessed areas are within an agro-landscape with a high degree of fragmentation of secondary forests, which can be attributed to colonization activities about 40 years ago. The vegetation cover can be summarized in secondary broad-leaved forests, secondary succession cover, and guamiles. In none of the areas of new plantations land preparations have occurred.

The Company has stipulated in its policies that it will not clear forest areas, including secondary ones in an advanced state of regeneration, for the establishment of plantations. This policy strengthens the decisions of the evaluation for the identification of HCV because there is already a conservation commitment. The precautionary criteria is an important variable in the HCV identification, used when there is no more information or there is no certainty of the absence or presence of an element, so the value is considered to be present. This principle was used in some cases in the evaluation because even though data was obtained in the field, there are some gaps of information that does not allow the values to be discarded. Next, a summary table of the values found, and whether the values are present in the wider landscape and/or in the new plantation properties.

Table 5.1. Summary of HCV identification in the proposed new plantation areas 2018

HCV	DESCRIPTION	Location	PRESENT	POTENTIAL	ABSENT
1	Concentrations of biological diversity that include RTE species and that are significant on national, regional, or global scales	Wider landscape / properties			

2	Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFL), 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 biological refuges	Wider landscape / properties	
4	Basic ecosystem services under critical conditions such as the protection of water table recharge areas and the control of soil erosion and protection of vulnerable slopes	Wider landscape / properties	
5	Sites and resources that are fundamental for meeting the basic needs of local or indigenous communities (e.g., livelihood means, health, nutrition, water, etc.,) identified through dialog with local and indigenous communities	Wider landscape / properties	
6	Significant sites, resources, habitats, and landscapes at national or global scales for cultural, archeological, or historic reasons, or that are of cultural, ecological, economic, religious, or a critical sacred significance to local and indigenous communities identified through dialog with said communities	Wider landscape	

3.1 HCV 1. Species diversity

Concentrations of biological diversity that include RTE species and that are significant on national, regional, or global scales (Brown et al. 2017)

POTENTIAL. HCV 1 is present both at the landscape level and at the local level of the properties for new plantations. In the case of the 2015 HCV assessment, HCV 1 was identified under a precautionary principle only in a protected area in the municipality of Sayaxché, outside the scope of this evaluation. In the areas of the 2015 evaluation that coincide in the wider landscapes of the present assessment, no HCV 1 were identified. The criteria of the common guide for the identification of HCV (Brown, et al., 2017) considered for HCV 1 were: a) populations of multiple endemic species or RTE, b) sites that are used by endemic species or RTE seasonally (temporarily), including migratory corridors, mating sites, refuge or hibernation, or as refuge from the disturbance.

The sites with nearby forest remnants of the sampling areas and within the wider landscape have the potential to protect RTE species identified in the sampling points (Figures 2.1 to 2.4). The criterion of proximity of sites suitable for RTE species as potential HCVs was considered.

Landscape 1. It is worth mentioning that the Company will not clear areas with secondary (or more mature) forests for new plantations. In the landscape there is no presence of key biodiversity sites, protected areas, areas of the alliance for zero extinction or biological corridors. At sampling point 1, 14 RTE species were found in this forest fragment (Figure 3.12). It is a secondary forest with sparse and scattered mature trees. The species that excel at this point are *Allouta pigra* (howler monkey), *Swietenia macro*phylla (mahogany), *Dalbergia stevensonii* (rosul or cocobolo), *Eupsittula ast*ec (parakeet) and *Leopardus pardalis* (ocelot). Howler monkeys move among fragments of forest in search of resources, the fewer resources a patch has, the greater the mobility of these primates in search of sites with better conditions (Anzures-Dadda and Manson, 2006). *A. pigra* is native (endemic) to the Yucatan Peninsula (Mexico and Belize) and north and central Guatemala (Marsh et al., 2008). Also, traces of *L. pardalis* were recorded, which is also a species of wide mobility and of the most common in Neotropical lowlands (Paviolo et atl., 2015). Considering the criteria indicated in the generic guide (Brown, et al., 2017), where the RTE species richness should be considered, and considering that these sites are used temporarily but due to the high fragmentation they acquire a high importance for these species, they deserve to be classified as AVC 1. The properties that have AVC 1 are SP11, SP12, SP18, OP25, SP27 and SP28. (Figure 3.16). The fragments within the assessed landscape are also considered AVC 1 by proximity. This classification is done under the precautionary principle because there are few or no biological studies in the area, and the biological concentration of landscape RTE species is not known.

Landscape 2. Within the landscape there is an area of oil palm of the Company assessed in 2015, within which no HCV 1 was identified. There are some fragments of broadleaf forest and a portion of floodplain. At sampling points 2 and 3 of Landscape 2, 12 RTE species were recorded (Figure 3.13 and Table 3.4). The species *Eupsittula astec* (Aztec parakeet) was observed a small flock, flying over the forest remnant of point 2. Most of the RTE species recorded in this landscape correspond to mammals, having presence of *A. pig*ra and *L. pardalis*, as well as other species whose main threat is hunting. Like the previous discussion, these broadleaf forest fragments are critical for RTE species, and even those that are not under any conservation category are considered to merit listing under HCV 1 under the precautionary principle. The latter because there is not much information about populations of RTE species in the landscape, as well as the viability of these in this fragmented scenario. The measure of conserving the potential habitat of these species may increase the chances of their conservation. The properties with HCV 1 are EP29, EP57, EP58 and EP59 (Figure 3.17).

Landscape 3. Annual agriculture predominates in this landscape, as well as shrub vegetation or low scrub. West of the landscape there are flood zones that are fed by some streams and rivers. There are also several areas planted with palm oil that were evaluated in 2015, in which no HCV 1 was identified. Fragmentation in this landscape is high, with little connectivity between forest remnants. At sampling points 4 and 5 were made within the remnants of broadleaved forest present in properties MP22 and PP04. Point 6 was evaluated in 2015 as part of the REA (López, 2015) and coincides with landscape 3. Despite the high fragmentation, 17 RTE species were recorded among the three sampling points (Figure 3.14). In the case of flora, only sampling points 4 and 5 presented RTE species while point 6 did not. Most of the RTE species are mammals, with the species *A. pigra* standing out, which was registered in sampling point 5 (property PP04) with a troop made by 4-6 individuals (Table 3.4). Considering the presence of RTE species in these fragments and because there is no information on the populations of RTE species present in the

landscape, under the precautionary principle these fragments (of the wider landscape) are classified as HCV 1. Properties with HCV 1 are PP04, and MP22 (Figure 3.18).

Landscape 4. The main land use is annual agriculture, and the cover is dominated by grassland, shrub vegetation or low scrub. In this landscape there are no areas that have no previous HCV assessment. In the sampling of point 7, a total of 5 RTE species were recorded (Figure 3.15), two birds of prey and three mammals that are subject to hunting (Table 3.4). It is observed in the coverage maps, that there is still some connectivity between the forest fragments, including the riparian forest of the San Román River. Because the characteristics of these fragments are very similar to those that have been evaluated in other landscapes, they have the potential to protect similar RTE species.

Therefore, considering the precautionary principle in order to reduce the risk of excluding some RTE species dependent on these fragments, the broadleaf forest fragments are classified as AVC 1. The properties that have AVC 1 are QP21 to QP30, QP32 QP33, QP37, QP36 (Figure 3.19).

Table 3.3. Summary of HCV 1 identified in the areas of new plantations 2018.

Landscape	No. RTE species	Brief HCV 1 Description	Properties with HCV 1
1	14	RTE species, mostly in fragments of broadleaved forest, which are critical for the maintenance of these species. It is considered that these remnants are important despite their high degradation, they are still capable of being functional for species such as *Allouta pigra* and *Leopardus pardalis*. There is a presence of RTE tree species, including precious woods, such as *Blepharidium guatemalense*, native of Guatemala and Honduras, *Swietenia macrophylla* and *Dalbergia stevensonii*. The RTE birds are hummingbirds, raptors and psittacids, and a species of duck, *Dendrocygna autumnalis*, threatened nationally.	SP11, SP12, SP18, OP25, SP27 y SP2
2	12	RTE species in the landscape, with little occurrence within the properties of new populations. The fragments of the landscape are critical for the maintenance of these species and their development in the landscape. Occurrence of species such as *Allouta pigra, Leopardus pardalis, Amazilia tzacatl, Eupsittula astec, Herpetotheres cachinnans* and *Rupornis magnirostris* are relevant for the conservation of their habitats.	EP29, EP57, EP58 y EP59
3	17	RTE species in the landscape, including within the fragments of broadleaved forest of evaluated properties. Despite the high intervention of area by agricultural activities, in the remnants of forest there were still individuals of *Allouata pigra, Tamandua mexicana,* and species vulnerable to hunting. Forest species such as *Blepharidium guatemalense* and *Pithecolobium leucocalyx,* threatened nationally, are present. *Amazilia tzacatl*, *Buteo plagiatus, Dendrocygna autumnalis, Herpethoteres cachinnans* and *Rupornis magnirostris* are RTE birds.	PP04, y MP22
4	5	Despite the low number of RTE species, it is considered that in the landscape there is and potential presence of RTE species in the fragments of broadleaved forest. The characteristics of the forests are very similar to those of the previous landscapes, including riparian forests that may have even more presence of RTE species. Therefore, fragments of broadleaved forest, which are critical to maintaining the biodiversity of the area, deserve to be classified as high value.	QP21 a la QP30, QP32 QP33, QP37, QP36

Table 3.4. RTE species sampled in each of the sampling points per landscape.

No.	Scientific name	Common name	Sampling point					State of Conservation		
			1	2/3	4/5	6	7	LEA	UICN	CITES
		Flora (trees)								
1	*Pithecolobium leucocalyx* (Britt. & Rose) Standl.	Guaciban	x		x			3	-	-
2	*Blepharidium guatemalense Standl.*	Irayol			x			2	EN	-
3	*Swietenia macrophylla* King	Mahogany	x					3	VU	II
4	*Dalbergia stevensonii* Standl.	Rosul	x					2	-	III
		Birds								
5	*Amazilia tzacatl*	Colibrí cola rojiza	x			x		3	LC	II
6	*Buteo plagiatus*	Aguililla gris	x	x	x				LC	II
7	*Dendrocygna autumnalis*	Pijije				x		3	LC	
8	*Eupsittula astec*	Perica azteca	x	x				3	LC	II
9	*Herpetotheres cachinnans*	Halcón reptilero		x		x	x	3	LC	II
10	*Rupornis magnirostris*	Gavilán caminero	x	x			x		LC	II
		Mammals								
11	*Allouata pigra*	Aullador	x	x	x			2	EN	I
12	*Procyon lotor*	Mapache		x	x		x	3	LC	
13	*Didelphis marsupialis*	Tacuazín						3	LC	
14	*Didelphis virginiana*	Tacuazín	x	x	x	x	x	3	LC	
15	*Sylvilagus brasilensis*	Conejo	x	x	x	x	x	3	LC	
16	*Sciurus aureogaster*	Ardilla	x	x				3	LC	
17	*Sciurus deppei*	Ardilla			x			3	LC	
18	*Dasypus novemcinctus*	Armado	x	x	x	x		3	LC	
19	*Tamandua mexicana*	Tamandúa/oso colmenero	x	x	x			3	LC	III
20	*Leopardus pardalis*	ocelote	x	x				2	LC	I

3.2 HCV 2. Ecosystems and landscape scale mosaics

Large landscape-level ecosystems, ecosystem mosaics and Intact Forest Landscapes (IFL), 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 (Brown et al. 2017).

ABSENT. The layers of protected areas were consulted (ESPREDE / MAGA / IGN, 2000) including, updated layer in .kmz format (CONAP, 2015), forest cover layers by type and subtype of forests (INAB, CONAP, 2012) Google images Earth and the map of intact forest landscapes (IFL), in the four

wider landscapes analyzed. There are no protected areas in the landscapes or forest masses that adhere to the threshold mentioned by the common guide of HCV (Brown et al. 2017) which is 50,000 ha. The history of land use indicates that due to the process of colonization and establishment of extensive livestock, the region suffered this high fragmentation since the 1960s, which it would not classify as HCV 2 because it is a fragmentation of anthropic origin. The common guide (Brown et al., 2017) also indicates that fragmented landscapes, which are below the 50,000 ha threshold, may be candidates for HCV 2 if they function as corridors / connectivity or buffer zones (e.g. buffer zone of protected areas, corridors that connect protected areas or high quality habitats). Smaller areas (fragments) would be considered HCV 2 if they play an important role in the maintenance or improvement of larger areas in the wider landscape (Brown et al., 2017). This is not the case for the four wider landscapes evaluated, the forest fragments have little connectivity with each other and do not contribute to connectivity with larger natural areas.

The experts consulted on the ecosystems of the area did not indicate the presence of key areas or high quality of habitat in these landscapes. The areas evaluated in the 2015 HCV that coincide with the areas evaluated in this report did not find HCV 2. It is considered that there are no areas that deemed of HCV 2 in the four landscapes.

3.3 HCV 3. Threatened ecosystems and habitats

Rare, threatened, or endangered ecosystems, habitats or biological refuges (Brown et al. 2013).

PRESENT. Most of the ecosystems, threatened or endangered habitats are contemplated in the Guatemalan Protected Areas System (SIGAP). As mentioned above, in the assessed landscapes there are no protected areas or key biodiversity sites (KBA, ZEA, IBA). The areas declared under the RAMSAR Convention were also reviewed within the National Wetlands Policy (CONAP, 2005), with no presence of wetlands or sites under this category. Additionally, the list of threatened ecosystems of the IUCN (https://iucnrle.org/) was reviewed to know the evaluations carried out or in process in the region where this HCV is being carried out. There are no areas cataloged for the country.

The remaining tropical forest of Guatemala is considered a critical habitat for endemic and threatened species (Melgar, 2003); even worldwide, they are considered the most deforested and fragmented forests (FAO, 2011). These forest patches can increase landscape connectivity (Dunning et al., 1992), and play a critical role in the viability of RTE species. Broadleaf forests in Guatemala are not uncommon, as the country's coverage is mostly of this type, however, in the areas assessed they are very fragile and vulnerable to changes in land use, felling, and unsustainable agricultural practices. (Van Tyulen com pers 2018). Since more than some RTE species was actually recorded in the four landscapes, and the use of these fragments was shown for mobilization and foraging (*Allouta pigra*), it is considered that they deserve to be classified as HCV 3. In some cases, the fragments include riparian forests within properties (landscapes 2 and 4) that are also considered HCV 3.

Landscapes 2, 3 and 4 have some flood zones, which are influenced by the Lechugal river (Landscape 2) and the San Román river (Landscape 4). These landscapes are in an area where water stress is acute in the dry season, these flooded areas might be the few water resources available for wildlife species, including RTE. The extensions of these areas and the role they play in

the hydrology of landscapes, and their importance for the edaphic resource and for biodiversity are unknown.

However, in the maps of land use and coverage (Figures 3.8 to 3.11) it is evident that they are rare and scarce habitats, so it is deemed to be classified as HCV 3.

The fragments cataloged as AVC 3 in the four landscapes are the same as those classified as AVC 1, including the same properties described in table 3.3. The difference is in the flood zones that are considered AVC 3, which in Landscape 2 are also present properties EP53, EP57, EP 58 and EP59. In Landscape 3, there are flood zones within properties MP22, PP30 and PP04. In Landscape 4, flood zones classified as AVC 3 are also present within properties QP34, QP35 and QP36 (Figures 3.16 to 3.19).

3.4 HCV 4. Ecosystem services

Basic ecosystem services under critical conditions such as the protection of water table recharge areas and the control of soil erosion and protection of vulnerable slopes (Brown et al. 2013).

POTENTIAL. Critical situations occur when the ecosystem service is interrupted and represents a severe, catastrophic or cumulative threat of negative impacts on the welfare, health or survival of a local community, or infrastructure or another HCV. In the current evaluation, the ecosystem services of support and regulation (regulation of floods, climate, diseases, water purification, genetic resources, nutrient cycling, primary production) are considered to as HCV 4. Other provisioning or cultural services are addressed later on since they overlap more directly with HCV 5 and 6.

Maintenance of quality of water resources: At national level, the coverage of the country has differentiated the gallery or riparian forests of other forests. These are forests that are of great importance in the protection of water sources, and for restoration of the banks of rivers and lakes and lagoons. These riparian forests dampen some of the sedimentation processes of riverbeds. These ecological services maintain the quality of the water and provide protection against floods and erosion (INAB-CONAP 2015). In the assessed landscapes there are several rivers or creeks, some pass-through assessed properties, and are used by the communities of the wider landscape. In the community consultations, information was received that many rivers or streams are used to obtain water for consumption or other activities (washing, recreation, fishing, etc.). Due to the functionality of the riparian forests in terms of protecting, maintaining or improving the quality and quantity of water of these landscapes, which are fragmented and arid areas, and that communities have difficulties in acquiring water (Bioterra, 2015), it is considered that the riparian zones should be classified as HCV 4. On a national level "the cutting down of trees is strictly prohibited, on the banks of rivers, streams, lakes, lagoons and water sources, up to 25 meters from their river banks ", according to decree 90-97 of the Health Code. Although there is not much hydrological information of the area, water balances studies or the ecosystem services that the riparian forests of this area really provide, under the precautionary principle, riparian zones are classified as HCV 4 (Figures 3.16 to 3.19).

Table 3.5. Summary of HCV 4 identified in the areas of new plantations 2018.

Landscape	Communities	Brief HCV 4 Description	Properties with HCV 4
1	Los Olivos y Sonora	The HCV is present at the landscape level and not within the properties assessed for new plantations. There are rivers that go through the communities. The river banks are mostly devoid of riparian forests, in some cases shrubs or low shrubs that are in this riparian zone and secondary forests. Within the evaluated properties there is no influence of the riparian zones, or its delimitation of 25 m of protection regulated by decree 90-97. It is considered that riparian zones can also serve as a corridor for RTE species in the landscape.	
2	La Esmeralda	The riparian zones of the Lechugal river cover a large part of this landscape, crossing several evaluated properties for new plantations. Much of the riparian zone lacks of coverage, however, within the properties will have the opportunity to restore, preserve or improve this value, as is the purpose of the identification of HCV. In this case, the riparian zone can also serve as a corridor for RTE species and maintain the flow regime for humid landscape areas.	EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59
3	El Prado	The value is present both at the landscape level and at assessed properties. In this case, the community within the landscape obtains its water from artesian wells and some streams, however, in the official hydrology layer there is no presence of rivers nearby. The streams or rivers may be very small. Some riparian zones can be corridors for the RTE species registered in the landscape, favoring the genetic flow, even maintaining the flow regime to the humid zones. There is connectivity between these riparian zones and that of the Chixoy River (some community members identify it as Salinas).	MP22
4	-	The value is present in the landscape and in the assessed properties. In this landscape, the service that the riparian zones provide is the connectivity of patches and genetic flow of the RTE species, as well as maintaining the quality and quantity of water from the San Román River and other tributaries of the Chixoy River. There are areas that can also help regulate the flow regime of flood areas.	QP21 a la QP30, QP32 QP34, QP35, QP37, TP39

Protection against floods or landslides: The topography, although it may be considered undulating in some areas, is mostly flat and does not present an imminent risk of causing landslide effects on any village or community (Bioterra 2015). In none of the assessed landscapes there is a risk of floods or landslides, which is why the regional risk susceptibility map is presented, generated with information from the National Coordinator of Risk Reduction (CONRED). As for level curves, the topography of the region is mostly flat, landscape 4 is the one that has greater variations, with sections where there are curves with differences of 50 m.

3.5 HCV 5. Community needs

Sites and resources that are fundamental for meeting the basic needs of local or indigenous communities (e.g., livelihood means, health, nutrition, water, etc.,) identified through dialog with local and indigenous communities (Brown et al. 2013).

PRESENT. In the community consultations, which most of the population are indigenous, the common denominator of the vital resource for subsistence is water. Most have access to the resource through artesian wells, however, in dry season the resource is reduced, and many depend on rivers and streams to supply. In the 2015 assessment, rivers were identified as HCV 5 under the precautionary principle, because it is a critical resource for human consumption and supply (Bioterra, 2015).

Landscape 1. The communities within this landscape are Los Olivos and Sonora, in which consultations with community leaders were developed. Regarding the use of natural resources for subsistence or basic needs, water was mainly mentioned. In Los Olivos and in Sonora there are some streams with low flows, but in dry season they are essential since it reduces the level of artisanal wells. Fishing is done in some rivers, not mentioning exactly which, as it is done recreationally and not as a critical resource to survive. The use of medicinal plants is not done since they also have access to local pharmacies. It is mentioned in the workshops that the population has been losing the practice of the use of medicinal plants. Firewood used for fuel is obtained by each family from their own plots, some buy the resource from street vendors. Because water bodies are an irreplaceable resource, it is critical for communities, especially in the dry season, all rivers and streams in the landscape are deemed as HCV 5 (Figure 3.16). In the assessed properties of 2018 there are no rivers or streams.

Landscape 2. The La Esmeralda community identified the rivers and streams as indispensable for the community. Although there are artisanal wells for the supply and consumption of water, riversplay a crucial role in the dry season. Other resources such as fishing are obtained from these rivers, which consume it as a supplement to the diet of the families. Medicinal plants and hunting are not mentioned as relevant to the community; both activities are not common in the community. The wood used for cooking is supplied from the plots of each family or bought from vendors. Because rivers provide essential and irreplaceable resources to the community, all these bodies of water are classified as HCV 5 (Figure 3.17). The properties that have AVC 5 are the same described in table 3.5 for this landscape.

Landscape 3. The El Prado community is the one found in this landscape, which has no rivers or streams nearby. The nearest river to obtain water is the Chixoy (some know it as Salinas), although some residents mentioned that they get water in some nearby streams. The community has artisanal wells, however, in the dry season the water levels fall, and it is necessary to head for the rivers and streams. In the Chixoy River people also fish as leisure activity but is not part of the family subsistence diet. Hunting is not a relevant activity in family subsistence, it is done by recreation. There are some water bodies in the landscape that can provide resource for the community; being similar the characteristics and needs of other communities, it is considered prudent to classify these bodies as HCV 5, being consistent with the 2015 evaluation at the same time (Figure 3.18). The properties with HCV 5 are the same as those described in table 3.5.

Landscape 4. There are no communities within this defined wider landscape, however, the presence of rivers and streams in the landscape have the potential to provide water resources in productive activities (irrigation agriculture). Because there was no consultation in this landscape, it is not known with certainty if these bodies supply any population or group of people downstream. Therefore, considering the precautionary principle, but also considering the findings of other landscapes, water bodies are classified as HCV 5 (Figure 3.19). Properties with this value are the same as those identified in Table 3.5, in the respective landscape.

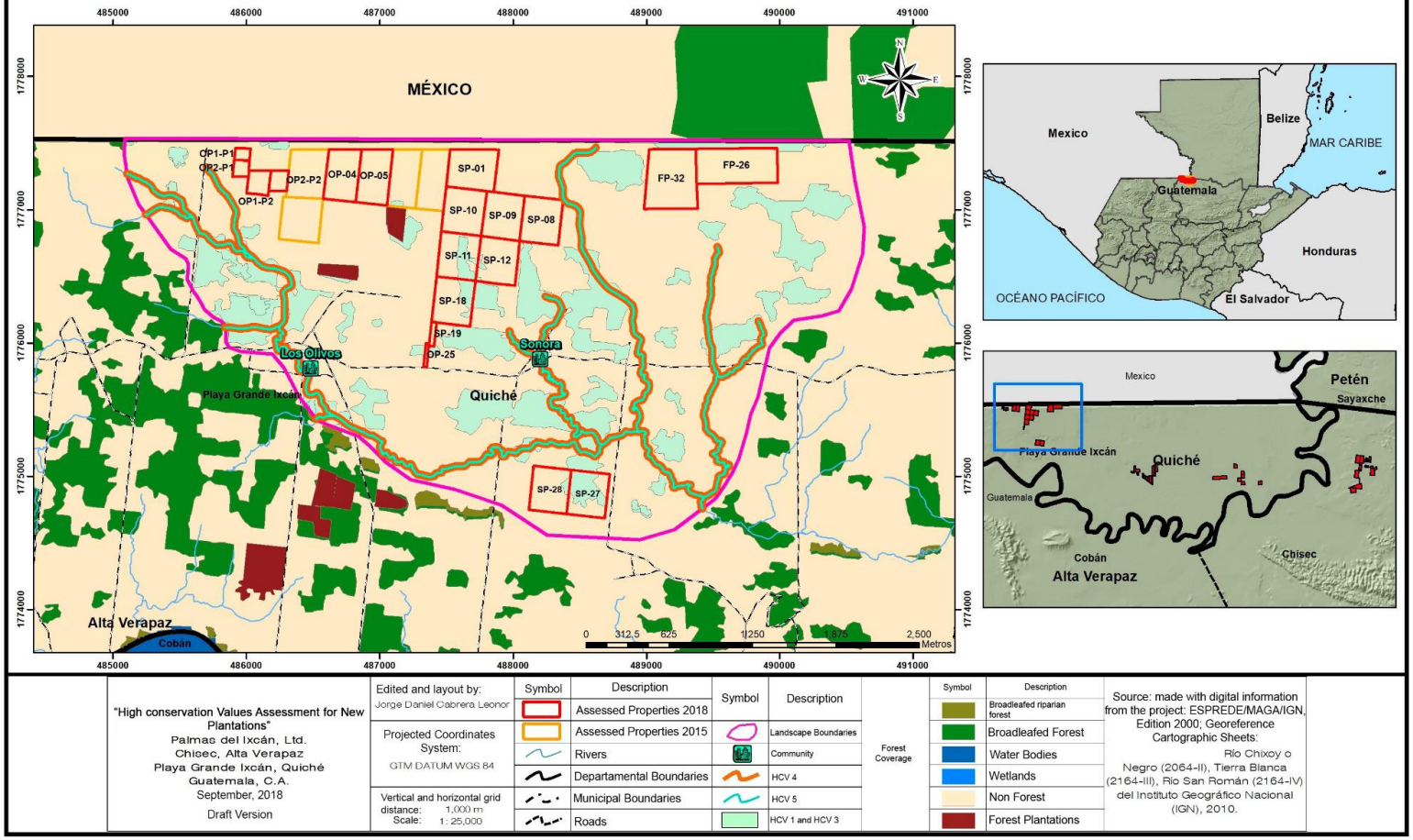
3.6 HCV 6. Cultural Values

Significant sites, resources, habitats, and landscapes at national or global scales for cultural, archeological, or historic reasons, or that are of cultural, ecological, economic, religious, or a critical sacred significance to local and indigenous communities identified through dialog with said communities (Brown et al. 2013).

PRESENT. The definition of HCV 6 is broad, so it is useful to divide it into two categories: cultural values of global or national importance, and critical values for the local population at the site scale (Brown et al., 2017). In the first instance, there are no sites declared as world cultural heritage in or near the evaluated landscapes, for which UNESCO was consulted (http://whc.unesco.org/en/statesparties/gt). The archaeological map that is on a general scale due to the scarcity of archaeological sites in the four landscapes evaluated, shows that these landscapes do not contemplate these sites. In the community consultations of the four landscapes the same answer was obtained, that they were not aware of the existence of cultural sites in the properties of new plantations and that there were no such values in their communities. The expert consulted informed that more research should be done in the region to characterize the area and rescue potential archaeological sites. The closest one is Kanela, which is near landscape 4 and is a secondary center (Ponciano com. Pers., 2018).

In the case of landscape 2, in consultation with the La Esmeralda community, people mentioned that as part of their religious beliefs, baptisms are carried out in the Se Chochoc river, which is located north of the community. These baptisms have been carried out for several decades, according to the people consulted, and are part of the beliefs of the group that practices these activities. The baptisms are made at several points of the river Se Chochoc, according to the appropriate characteristics of the site (presence of pools, without major current), there is no specific location in this river to pin out in the map. Therefore, considering what is indicated by the common guide to HCV identification (Brown, et al., 2017), religious or sacred sites that have an importance to local communities deserve to be classified as HCV 6 (Figure 3.17).

HIGH CONSERVATION VALUES (LANDSCAPE 1)



"High conservation Values Assessment for New Plantations"
Palmas del Ixcán, Ltd.
Chisec, Alta Verapaz
Playa Grande Ixcán, Quiché
Guatemala, C.A.
September, 2018
Draft Version

Edited and layout by:
Jorge Daniel Cabrera Leonor

Projected Coordinates System:
GTM DATUM WGS 84

Vertical and horizontal grid distance: 1,000 m
Scale: 1: 25,000

Symbol	Description
	Assessed Properties 2018
	Assessed Properties 2015
	Rivers
	Departamental Boundaries
	Municipal Boundaries
	Roads

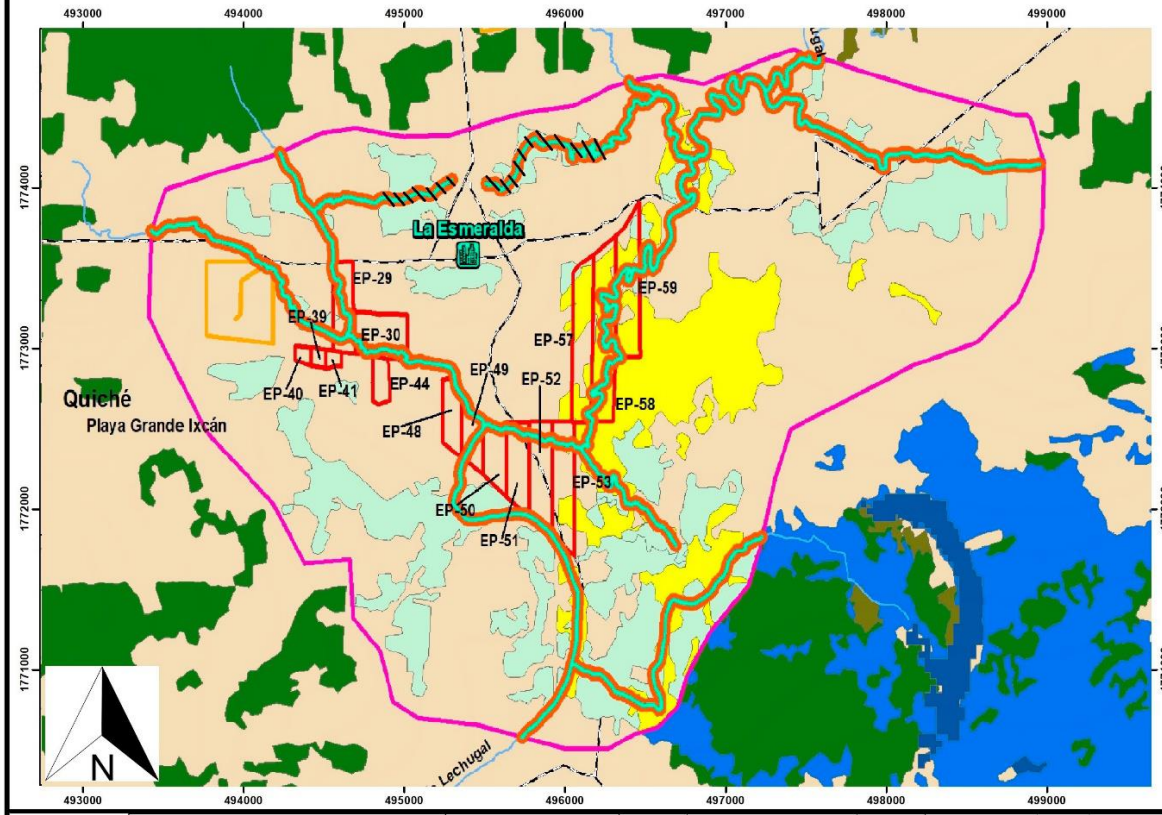
Symbol	Description
	Landscape Boundaries
	Community
	HCV 4
	HCV 5
	HCV 1 and HCV 3

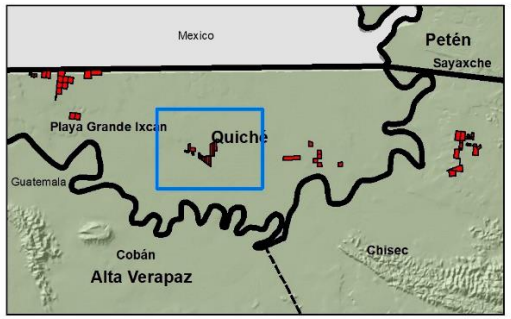
Forest Coverage

Symbol	Description
	Broadleafed riparian forest
	Broadleafed Forest
	Water Bodies
	Wetlands
	Non Forest
	Forest Plantations

Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

HIGH CONSERVATION VALUES (LANDSCAPE 2)





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Vertical and horizontal grid distance: 1,000 m
Scale: 1: 25,000

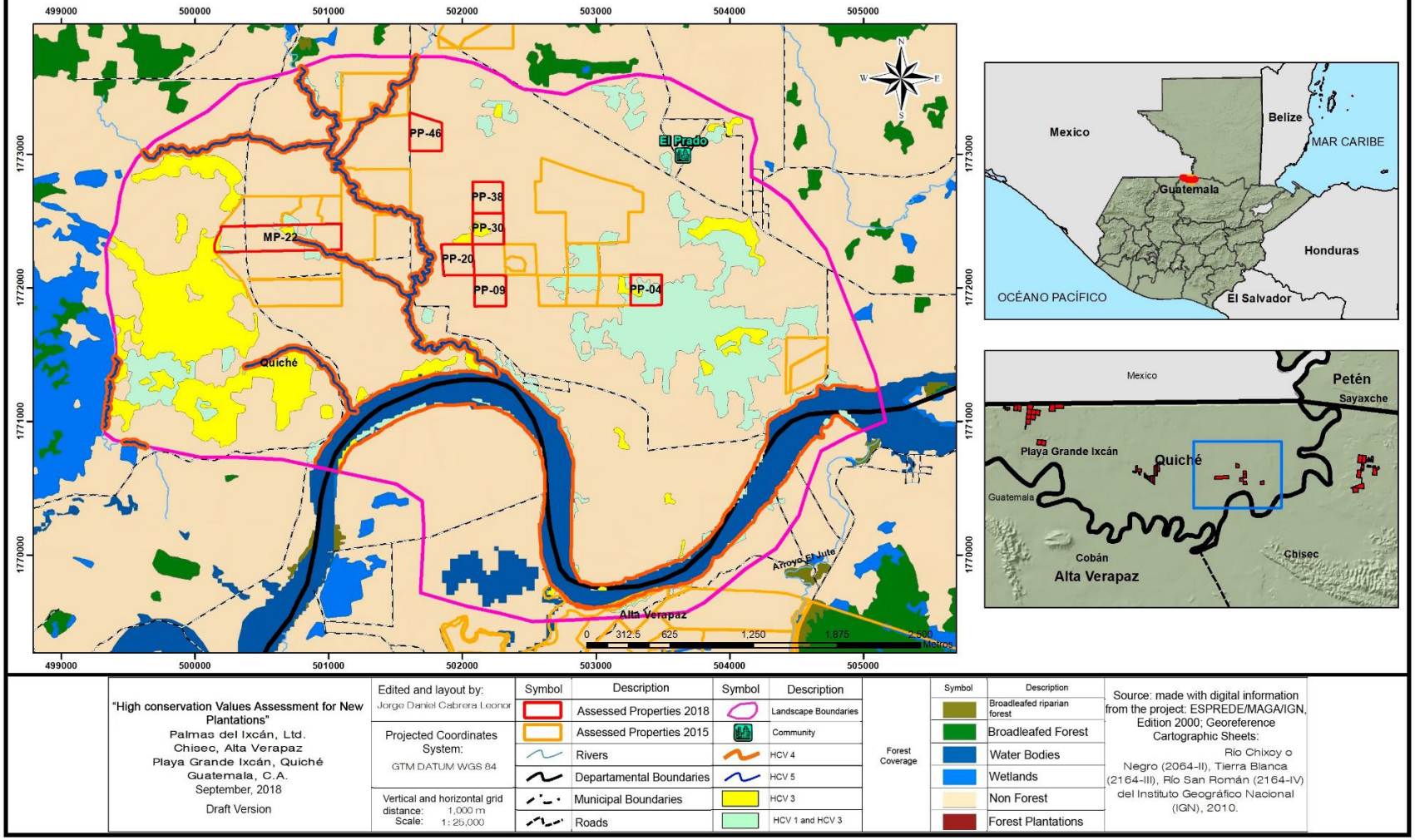
Symbol	Description	Symbol	Description	Symbol	Description
	Assessed Properties 2018		Landscape Boundaries		HCV 6
	Assessed Properties 2015		Community		
	Rivers		HCV 4		
	Departamental Boundaries		HCV 5		
	Municipal Boundaries		HCV 3		
	Roads		HCV 1 and HCV 3		

Forest Coverage

Symbol	Description
	Broadleafed riparian forest
	Broadleafed Forest
	Water Bodies
	Wetlands
	Non Forest
	Forest Plantations

Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

HIGH CONSERVATION VALUES (LANDSCAPE 3)



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Chisec, Alta Verapaz
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September, 2018
Draft Version

Edited and layout by:
Jorge Daniel Cabrera Leonor

Projected Coordinates System:
GTM DATUM WGS 84

Vertical and horizontal grid distance: 1,000 m
Scale: 1: 25,000

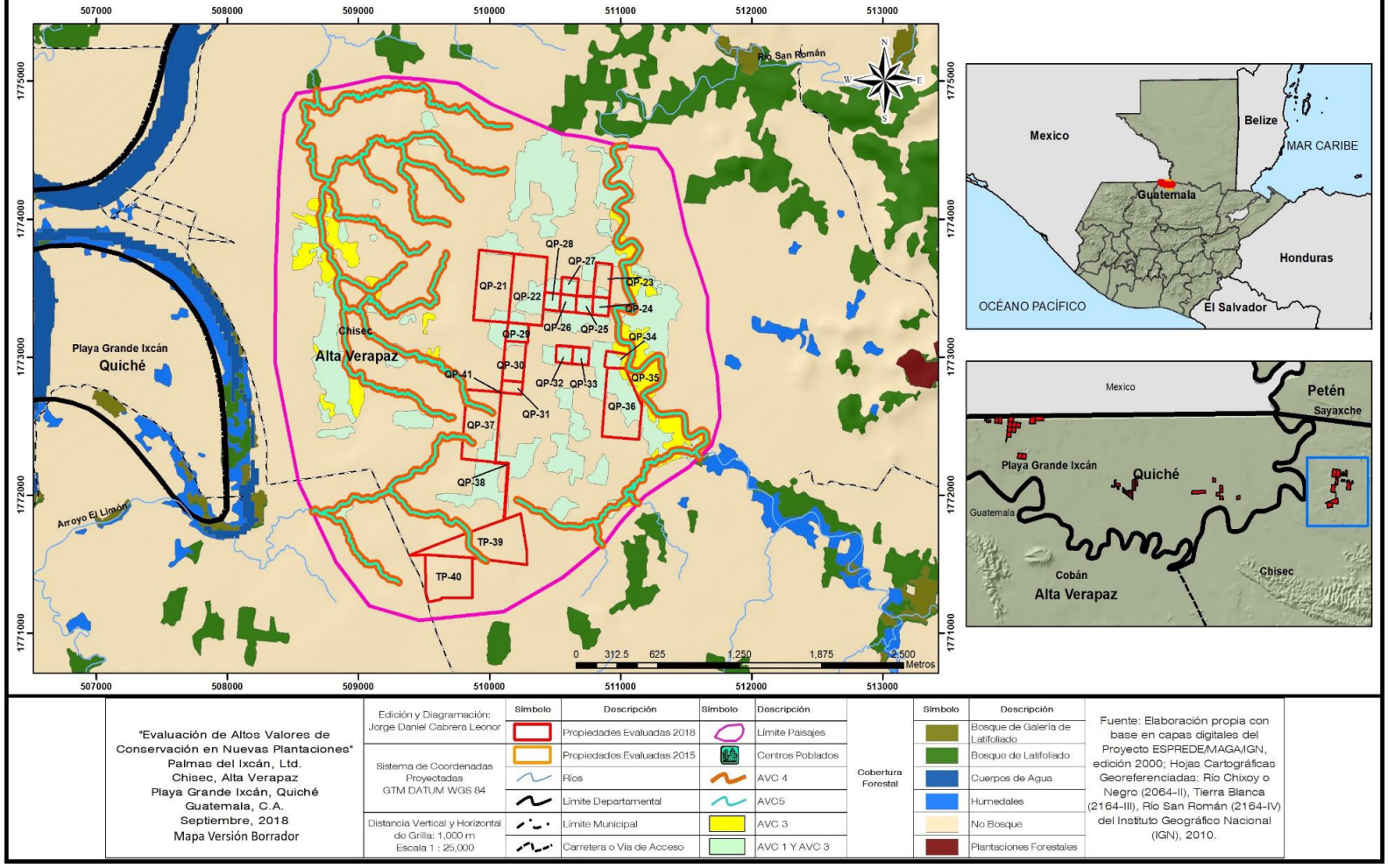
Symbol	Description	Symbol	Description
	Assessed Properties 2018		Landscape Boundaries
	Assessed Properties 2015		Community
	Rivers		HCV 4
	Departamental Boundaries		HCV 5
	Municipal Boundaries		HCV 3
	Roads		HCV 1 and HCV 3

Forest Coverage

Symbol	Description
	Broadleafed riparian forest
	Broadleafed Forest
	Water Bodies
	Wetlands
	Non Forest
	Forest Plantations

Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

ALTOS VALORES DE CONSERVACIÓN (PAISAJE 4)



"Evaluación de Altos Valores de Conservación en Nuevas Plantaciones"
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Chisec, Alta Verapaz
Playa Grande Ixcán, Quiché
Guatemala, C.A.
Septiembre, 2018
Mapa Versión Borrador

Edición y Diagramación: Jorge Daniel Cabrera Leonor

Sistema de Coordenadas Proyectadas GTM DATUM WGS 84

Distancia Vertical y Horizontal de Grilla: 1,000 m
Escala 1 : 25,000

Símbolo	Descripción	Símbolo	Descripción
	Propiedades Evaluadas 2018		Límite Paisajes
	Propiedades Evaluadas 2015		Centros Poblados
	Ríos		AVC 4
	Límite Departamental		AVC5
	Límite Municipal		AVC 3
	Carretera o Vía de Acceso		AVC 1 Y AVC 3

Cobertura Forestal

Símbolo	Descripción
	Bosque de Galería de Latifoliado
	Bosque de Latifoliado
	Cuerpos de Agua
	Humedales
	No Bosque
	Plantaciones Forestales

Fuente: Elaboración propia con base en capas digitales del Proyecto ESPREDE/MAGA/IGN, edición 2000; Hojas Cartográficas Georeferenciadas: Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

As it is shown in the high conservation values map, the HCV 1 and HCV 3 areas are overlap, the company is going to follow a management plan to preserve this areas:

- No hunting and no logging policy.
- Label area with prohibitions (Spanish and Q'echí).
- Restrict or control access to areas with RTE species, control and surveillance.
- Sensitize the Company's collaborators and extend talks to communities of the broader landscapes on HCV, conservation of wild species, with special focus on RTE.
- Restoration un degraded sites of fragments of broadleaved forest, by means of natural succession or intervention (use local species, local seed of the same landscape patches).

5.2 LUC

ANALYSIS OF CHANGE OF USE / LAND COVERAGE (LUCC) 2006-2017

Date RSPO	Nov 05	Nov 07	Dec-09	May-14	Current year

LUC Year Landsat data	12/03/2006	28/12/2007	24/04/2010	03/02/2014	05/01/2017
	2006	2007	2010	2014	2017
Community El Prado					
Agricultural / Cattle Land	17.89	7.88	7.88	7.09	11.67
Bushes / Pastures	14.99	24.69	25.38	26.17	21.59
degraded Forest	0.38	0.70	0.00	0.00	0.00
Total	**33.26**	**33.26**	**33.26**	**33.26**	**33.26**
Community Esmeralda					
Agricultural / Cattle Land	47.67	48.38	47.93	34.40	20.78
Bushes / Pastures	14.23	13.36	13.81	27.00	41.32
degraded Forest	0.31	0.47	0.47	0.82	0.12
Total	**62.22**	**62.22**	**62.22**	**62.22**	**62.22**
Community Las Flores					
Agricultural / Cattle Land	6.98	10.18	10.18	16.07	3.65
Bushes / Pastures	10.60	6.89	6.89	17.26	29.61
degraded Forest	15.75	16.25	16.25	0.00	0.06
Total	**33.33**	**33.33**	**33.33**	**33.33**	**33.33**
Community Las Minas					
Agricultural / Cattle Land	13.78	12.88	12.88	6.48	12.13
Bushes / Pastures	4.19	5.09	5.09	11.49	5.83
Total	**17.97**	**17.97**	**17.97**	**17.97**	**17.97**

Community Los Olivos					
Agricultural / Cattle Land	28.82	21.94	21.94	27.72	27.40
Bushes / Pastures	0.00	0.00	7.46	1.68	1.99
degraded Forest	0.57	7.46	0.00	0.00	0.00
Total	**29.39**	**29.39**	**29.39**	**29.39**	**29.39**
Community Nuevo Paraiso					
Agricultural / Cattle Land	0.82	0.23	0.55	3.00	5.28
Bushes / Pastures	1.02	2.01	2.20	2.27	0.00
degraded Forest	3.43	3.03	2.52	0.00	0.00
Total	**5.28**	**5.28**	**5.28**	**5.28**	**5.28**
Community 5000 Tierra Blanca					
Agricultural / Cattle Land	17.87	25.88	25.31	14.32	20.46
Bushes / Pastures	9.02	1.01	1.58	12.57	6.43
degraded Forest	0.00	0.00	0.00	0.00	0.00
Total	**26.89**	**26.89**	**26.89**	**26.89**	**26.89**
Community Las Mercedes					
Agricultural / Cattle Land	51.00	43.13	43.13	43.90	45.05
Bushes / Pastures	17.81	31.29	31.29	30.75	33.33
degraded Forest	11.92	6.31	6.31	6.07	2.36
Total	**80.73**	**80.73**	**80.73**	**80.73**	**80.73**
Community Santa Cruz					
Agricultural / Cattle Land	0.26	0.64	0.64	0.00	0.00
Bushes / Pastures	1.06	0.68	0.68	1.32	1.32
Total	**1.32**	**1.32**	**1.32**	**1.32**	**1.32**
community Sonora					
Agricultural / Cattle Land	58.68	35.40	42.37	58.66	50.86
Bushes / Pastures	23.32	45.55	38.58	30.44	39.69
degraded Forest	8.77	9.82	9.82	1.66	0.22
Total	**90.76**	**90.76**	**90.76**	**90.76**	**90.76**
community Victoria					
Agricultural / Cattle Land	9.63	10.08	14.55	14.46	13.58
Bushes / Pastures	5.81	5.60	1.48	1.86	2.74
degraded Forest	0.88	0.64	0.30	0.00	0.00
Total	**16.32**	**16.32**	**16.32**	**16.32**	**16.32**

Community Nursery D1					
Agricultural / Cattle Land	0.00	7.02	10.78	10.78	10.78
Bushes / Pastures	2.93	3.77	0.00	0.00	0.00
degraded Forest	7.86	0.00	0.00	0.00	0.00
Total	**10.78**	**10.78**	**10.78**	**10.78**	**10.78**
Grand total	408.25	408.25	408.25	408.25	408.25

SUMMARY ANALYSIS OF LAND USE CHANGE / LAND COVER (LUCC) 2006 - 2017

Date RSPO	Nov 05	Nov 07	Dec-09	May-14	Current year

LUC Year Landsat data	12/03/2006	28/12/2007	24/04/2010	03/02/2014	05/01/2017
	2006	2007	2010	2014	2017
Agricultural / Cattle Land	253.41	223.63	238.14	236.88	221.65
Bushes / Pastures	104.97	139.94	134.44	162.82	183.84
degraded Forest	49.87	44.67	35.67	8.55	2.76
Grand total	**408.25**	**408.25**	**408.25**	**408.25**	**408.25**

5.3 Social Impact Study

In the minutes of the community assemblies that each village proceeded to carry out, the agreements regarding what was reported by Palmas del Ixcan remained.

Among the social impacts perceived by the community and identified as important in this documentary review, the following are indicated:

Impacts received	% of perceived impact / category prevalence	Recommendation
Risk of accidents on the road due to imprudence of palm fruit transport pilots	13% Category: Low	Ensure that transport service providers are aware of respect for traffic legislation and respect for speed on roads near towns.

Generation of jobs for people in the community (local jobs)	63% Category: High	It is recommended to continue with the current strategy of Palmas de Ixcan on giving notice of the hiring of local jobs through the COCODES of the communities, it is recommended to report with truth the capacity of the company for hiring and the specifications of the characteristics of the jobs such as temporary hiring, income subject to productivity, etc. because the risk of generating a large expectation in the communities and then not being able to fulfill it can generate local conflicts. ¨ On the other hand it is perceived as a very positive impact regarding the generation of income through stable employment.
Respect for the environment	38% Category: Medium	It was noted the concern for the conservation of the environment, especially water sources (births) that exist close to some of the parcels so it is suggested to address this issue with special care applying the company's policies and current national legislation . Some people indicated that they agreed with the planting, however, they made it clear that they did not agree with the implementation of the extractor plant in the community since there is a perception that this generates contamination.
Road infrastructure	38%	The community expects that street extensions will be made

	Category: Medium	and that the plots will not have feathers (talenqueras) to prohibit the passage, so as not to limit the roads that may be of use to the community.

It is essential that Palmas de Ixcan take into account the expectations of the communities expressed through this participatory exercise and that these are included in the mitigation and promotion plans in the thematic axes that correspond to Palmas de Ixcan works, this in order to ensure that the actions are stipulated as part of an integrated plan and not that actions are carried out in isolation.

It can clearly be deduced that the local authorities and the neighbors that participated in the process positively see the establishment of new plantations in their communities, mainly because the main perceived effect is the generation of jobs for local labor, therefore, It is essential that Palmas de Ixcan has considered the possibility of filling this expectation which is the highest.
In addition, considering that the communities that participated in this exercise are in areas of influence where Ixcan Palms already has operations for years, it is considered a competitive advantage to have a cordial relationship and under a communication scheme with local authorities and the neighbors of these areas, maintaining clear communication channels and highlighting the Open Doors policy of the company will contribute to maintaining good relations and dialogue.

The communities that participated in this Free Prior and Informed Consent process are part of the areas of influence of Palmas de Ixcan, which even participated during the year 2017 in the focus groups carried out with the purpose of updating the mitigation and promotion plans of The company, for this reason, CentraRSE suggests taking into account the information gathered on that occasion, where neighbors and authorities had the opportunity to express more widely the impacts that they perceived derived from the operations of Palmas del Ixcan in 4 areas: Impacts on the home, Impacts on work, impacts on the community and impacts on the environment.

In order to ensure that Palmas de Ixcan takes into account this information, which becomes the expectations of the stakeholders, we will quote in this document the result of this exercise carried out in 2017 corresponding to the interest groups in the areas of influence of Palmas de Ixcan.

82% of participants highlighted the importance of having a stable income, the generation of local economy and work according to what is stipulated by the law, 18% also highlighted that this situation represents an improvement in the quality of life of their person and family. In addition, there are other comments with coincidence regarding the opportunity of studies that give and the reduction of migration as a positive effect of the establishment of the company in the region.

The main direct impacts identified in terms of the work provided by Palmas del Ixcan in the area are highlighted that 60% of the participants consider an improvement of the economy and stable income in the region due to the operations of Palmas de Ixcan in the area, also that 3% of the participants considered very important the contribution of supplies that are given to small

producers. Palmas del Ixcan is perceived as a flexible company in terms of allowing permits and considerations to workers and highlighted the favorable working conditions both in terms of work environment and safety when performing work. In addition, another topic of much coincidence among the participants was the opportunity that has been given internally to opt for professional growth within the company through promotions and salary improvements, training and professional development.

35% of the participants consider that the main impact of Palmas del Ixcan is the generation of economic dynamics at the community level where work generates stable income according to the law and as a consequence the establishment of small business units that generate better economy in the community, another high percentage perceives the contribution of Palmas de Ixcan in improving the community's infrastructure, such as the repair and renovation of schools, health centers and streets and highways. 7% of the participants also highlighted the contribution that Palmas del Ixcan has made in payment to teachers and delivery of school supplies. The trainings and talks given to the community are also perceived as a positive impact since they indicate that they have managed to change behaviors and know good community practices to implement them, and again in this section it is mentioned that the previous impacts contribute to reduce migration.

The topic of the environment is one of the topics most linked to the cultivation of oil palm, however, acceptance and perception of positive impacts predominate, such as that participants know that Palmas de Ixcan complies with the environmental regulations of the country, 51% of the participants considers the efforts made by the company for the preservation of the environment (flora and fauna) and natural resources such as water sources and forests. 13% of the participants know about the reforestation programs and initiatives of Palmas de Ixcan and translate this as an improvement in the quality of life of the people in the communities. They also highlighted the recycling practices of the company, with a high percentage that He mentioned having participated in the trainings and talks that are given on the subject of the environment to the people of the communities.

Among the perception of the negative impacts, 29% of the participants consider that environmental conditions should improve, perceive a deterioration of the environment related to the use of fertilizers, extinction of habitat of species such as monkeys and deer. 14% of the comments referred to improving the control of pests (especially flies) and the existence of smoke and bad smell.

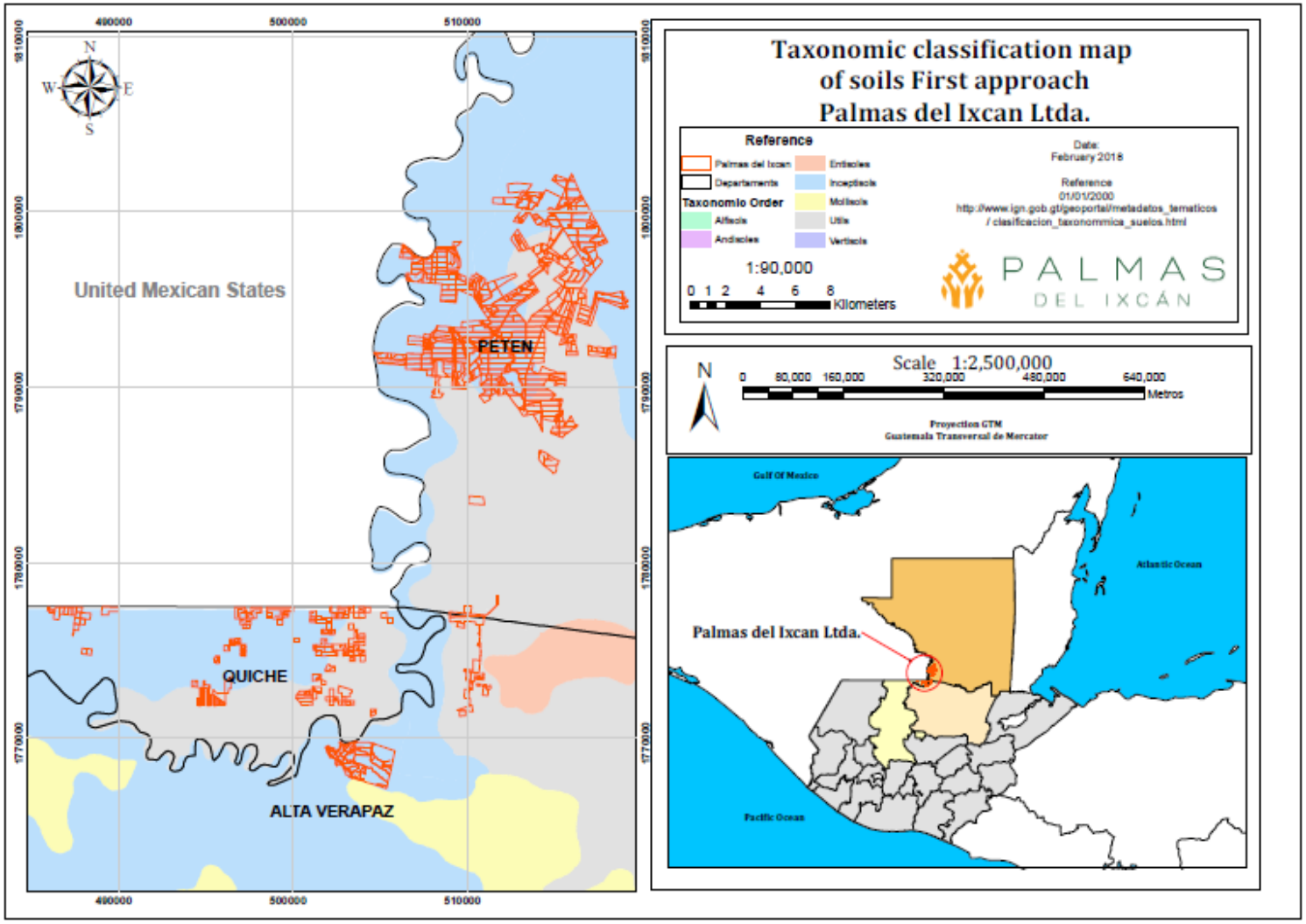
5.4 Environmental Assessment

Positive and negative environmental effects .

Activities	Positive Effects	Negative effects
Soil	The incorporation into the soil of the palm branches that had been cut off, which increases the organic content.	No significant negative impacts are identified in the agricultural activities of the proyect, since they are developed in a technical way without affecting the physical
Superficial Water	The rivers borders will be	

	reforested	and chemical factors.
Underground Water	There will not be irrigation activity, so the underground water will not be used.	
Vegetation	There will be vegetation areas and natural corridors to interconnect the areas and restore the riparian forest.	No significative negative environmental impacts are identified, the project will not perform any conversion of use, and is not going to remove forest cover.
Fauna	Fauna can develop in areas of reserves and natural corridors.	
Socioeconomic conditions	The effect this project will have is the job that will offer, many communities will have jobs.	There are no negative effects, because the project will bring jobs to the communities.
Waste generation	A recycle plan will take place, so all the waste generated can be sell and will no contaminate.	

5.5 Soil study



5.6 Greenhouse gases evaluation

Carbon Footprint results of new plantations, Palmas del Ixcán

The results obtained in the quantification of the carbon footprint in the New Planting Area, the calculation thereof is performed in the tool developed by RSPO called New Development GHG Calculator.

Table 5. Summary of emissions per tonne produced, NPP - Palmas del Ixcán-

Summary (withmill)	
Product	tCO_2e/t product
CPO	6.10
PK	6.10

Source: Green Development based on New Development GHG Calculator RSPO, 2017

On previous table it can be observed that the new plantings will contribute with benefits to the environment regarding the carbon footprint, the new plantings will stock 6.10 tCO_{2e} per ton of palm oil or palm kernel produced. It is important to mention that the balance between emissions and carbon fixation is taken into account with a positive sign (+) as all the contributions with the atmosphere and with a negative sign (-) all the sources of atmospheric carbon stocks.

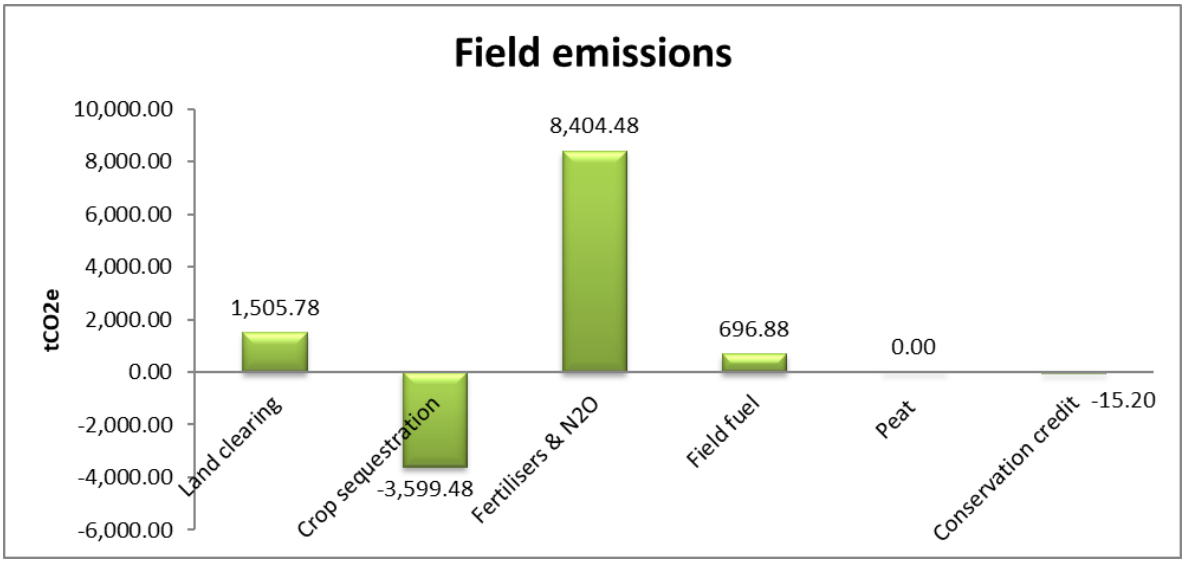
Table 6. Emissions **sources and carbon stock in the estate, NPP – Palmas del Ixcán –**

Sources	t CO_2e	t CO_2e/ha	t CO_2e/t FFB
Land clearing	1,505.78	3.92	0.18
Crop sequestration	-3,599.48	-9.36	-0.43
Fertilizers	1,790.83	4.66	0.21
N2O	6,613.64	17.20	0.78
Field fuel	696.88	1.81	0.08
Peat	0.00	0.00	0.00
Conservation credit	-15.20	-0.04	-0.002
Total	6,992.45	18.19	0.83

Source: Green Development based on New Development GHG Calculator RSPO, 2017

According to Table 6, the production of Fresh Fruit Bunches in the estimation of emission sources, Land Clearing has 0.18 tCO2e/tFFB, fertilizers with 0.21 tCO2e/tFFB, Nitrogenous fertilizers and effluent 0.78 tCO2e/tFFB, 0.08 tCO2e/tFFB fossil fuels in agricultural activities. Within the sources of carbon stocks, the estimation is that the palm oil crops will stock -0.43 tCO2e/tFFB and the secondary forest will stock around -0.002 tCO2e/tFFB.
The balance between emissions and stocks in tCO2e per source is estimated below for the implementation and development of the New Plantings. It can be observed that the biggest emissions source will be from fertilizer utilization.

Figure 11. Emission sources and Carbon Stocks in estate, New Plantings - Palmas Ixcan –



Source: Green Development based on New Development GHG Calculator RSPO, 2017

Table 7. Emissions sources and Carbon credits for Mill, NPP - Palmas del Ixcán -

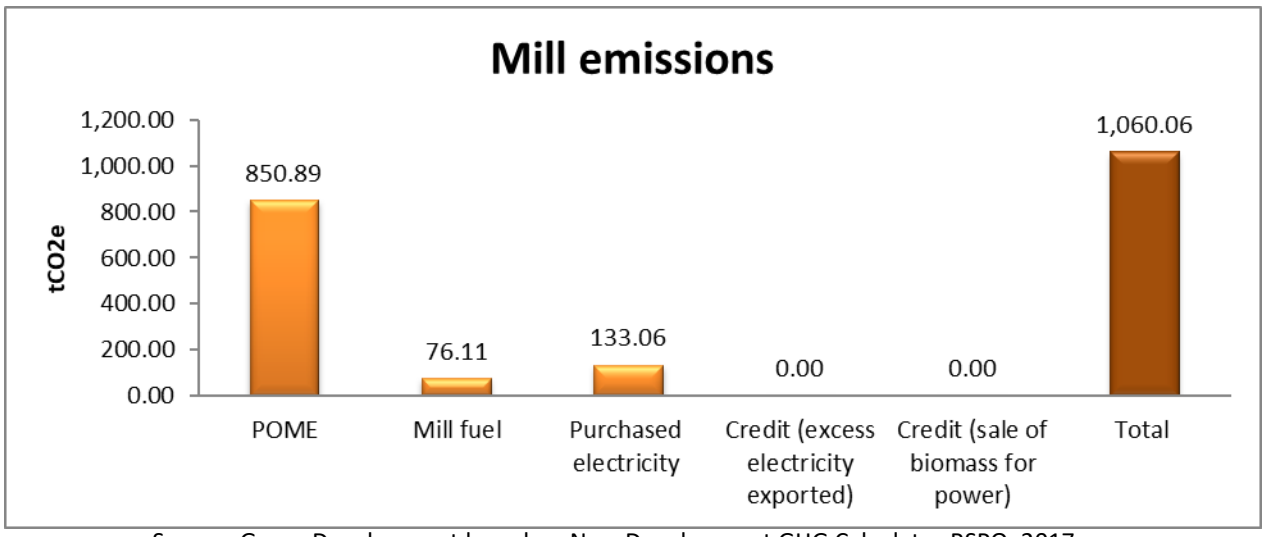
Mill emissions & credit	tCO_2e	$t\ CO_2e/ha$	$tCO_2e/tFFB$
POME	**850.89**	**2.21**	**0.10**
Mill fuel	**76.11**	**0.20**	**0.01**
Purchased electricity	**133.06**	**0.35**	**0.02**
Credit (excess electricity exported)	**0.00**	**0.00**	**0.00**
Credit (sale of biomass for power)	**0.00**	**0.00**	**0.00**
Total	**1,060.06**	**2.76**	**0.13**

Source: Green Development based on New Development GHG Calculator RSPO, 2017

In Table 7 it can be observed that the emissions sources and carbon stocks that area implicated in the processing of fruit bunches in the Mill. Within the sources we can observe that 0.10 tCO_2e/tFFB are for methane gas produced by the decomposition of organic matter in the industrial effluent, 0.01 tCO_2e/tFFB for the use of fossil fuels, and 0.02 tCO_2e/tFFB produced by purchased electric energy from the national network. The main source of carbon stock is the utilization of biomass in the boilers to generate energy with -1.86 tCO_2e/tFFB.

In Figure 12 the emission sources and the absence of carbon stocks for Mill can be observed. The emission source with the greatest impact is the estimate of industrial effluent. Summary of emissions sources from mill will be around 1,060.06 tCO2e.

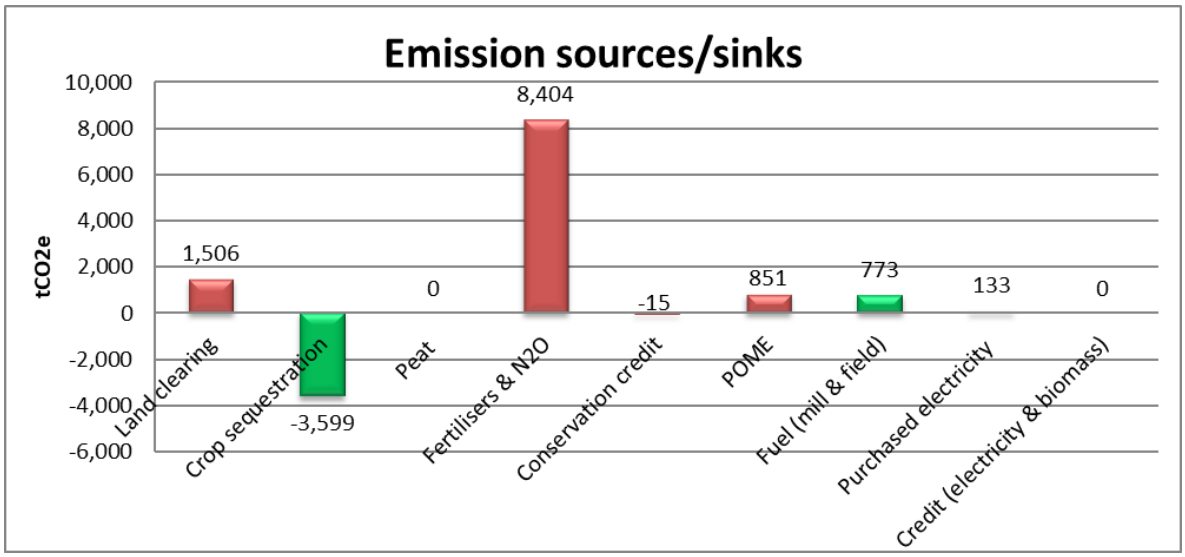
Figure 12. Emission sources and carbon stocks for the Mill, New Plantings– Palmas del Ixcán



Source: Green Development based on New Development GHG Calculator RSPO, 2017

Figure 13 shows the balance between the total amount of emissions and the total amount of carbon stocked in the development of the New Plantings 2018 of Palmas del Ixcán.

Figure 13. Emission sources and total carbon stock, New Plantings - Palmas Ixcan –



Source: Green Development based on New Development GHG Calculator RSPO, 2017

5.7 FPIC

After the explanation of private property, people of the communities agree that Palmas del Ixcán is allowed to plant in plots that belong to them and marked on a map plots that belong to the company Palmas del Ixcán, and what the area that belongs to the community, and a report was drawn up in their respective books of minutes of the communities, read and being all agree, the act was signed.

A. EL PRADO


COMUNIDAD EL PRADO
Área Para Siembra de Palma
Área Comunal
PALMAS

B. ESMERALDA


COMUNIDAD ESMERALDA
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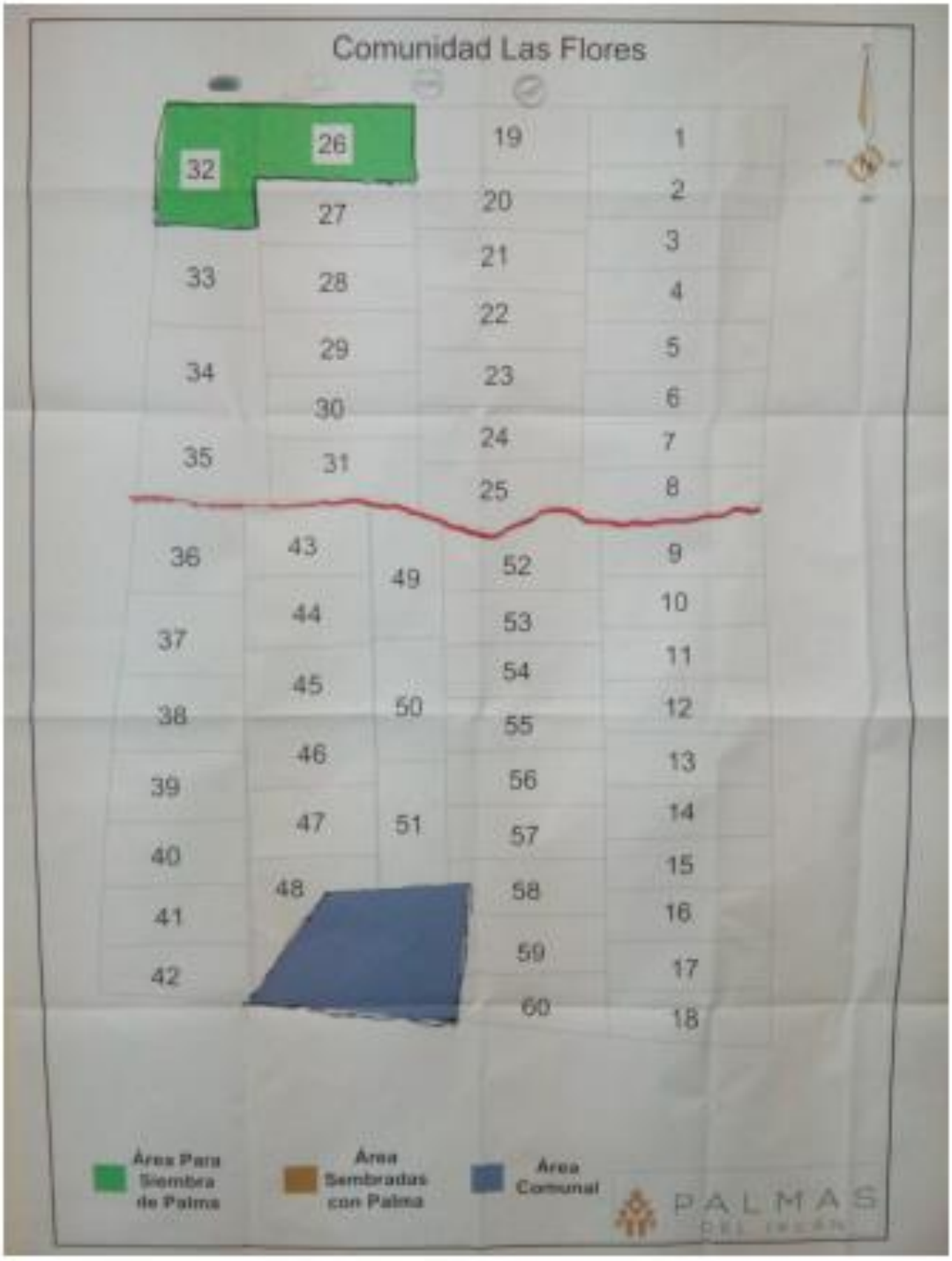
PALMAS

C. LAS FLORES


Comunidad Las Flores
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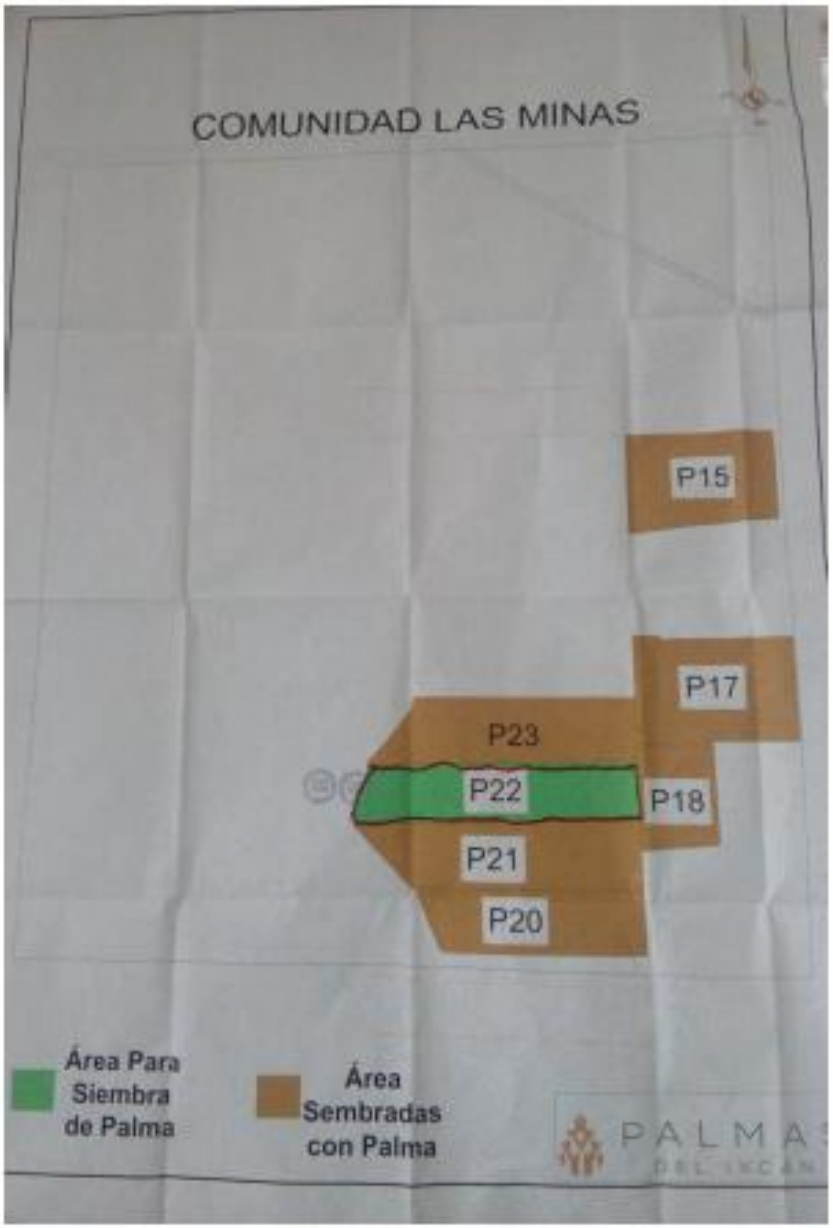
Área Para Siembra de Palma
Área Sembradas con Palma
Área Comunal
PALMAS DEL INCA

D. LAS MINAS

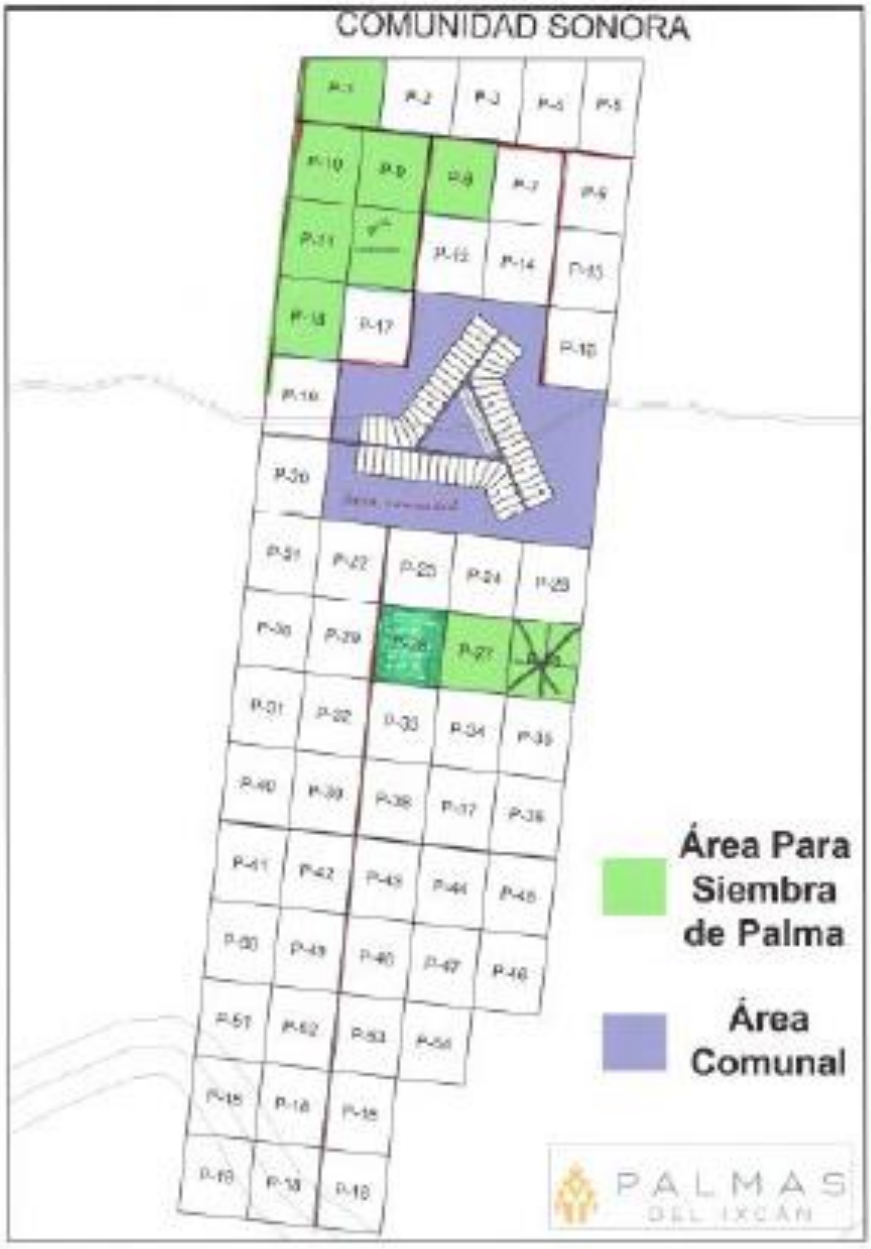

COMUNIDAD LAS MINAS
P15
P17
P23
P22
P18
P21
P20
Área Para Siembra de Palma
Área Sembradas con Palma

E. LOS OLIVOS


COMUNIDAD LOS OLIVOS
Área Para Siembra de Palma
Área Comunal
PALMAS

F. NUEVO PARAISO

G. SONORA


COMUNIDAD SONORA
Área Para Siembra de Palma
Área Comunal
PALMAS DEL IXCÁN

H. TIERRA BLANCA 5000

I LAS MERCEDES

Among the main comments found in the records are the following:

Community El Prado: Local authorities mention you do not need to take minutes to be planted in their fields who already have purchased.

Community Esmeralda : You can plant and cultivate plots that the company is responsible for and the plots were sold voluntarily. They benefit everyone with work.

Community Las Flores: The plots will be planted where are privately owned, is no communal area. The community agrees with the sowing because it is a source of employment

Los Olivos Community : The company will plant on private property and they have no conflict and each owner has freely and willingly of their land and exercising their rights the law grants.

New Community Paraiso: No objection to the company sowing their land.

Community Tierra Blanca 5000: Agrees that palm is planted because it is a source of employment and plots are privately owned.

Community Las Mercedes: The community agrees, because there will be opportunity for work.

6 Summary of managements plans

6.1 TEAM RESPONSIBLE FOR DEVELOPING MANAGEMENT PLANS

- Responsible team of the preparation of plans

High conservation value assessment	Biologist José Luis López Consultant for HCV network
Environmental Assessment	Ing. Agr. Hugo Merida Environmental manager for Palmas del Ixcán
Social Impact Study	CENTRARSE

Greenhouse gases Evaluation	Green Development Ing. Amilcar Ordoñez

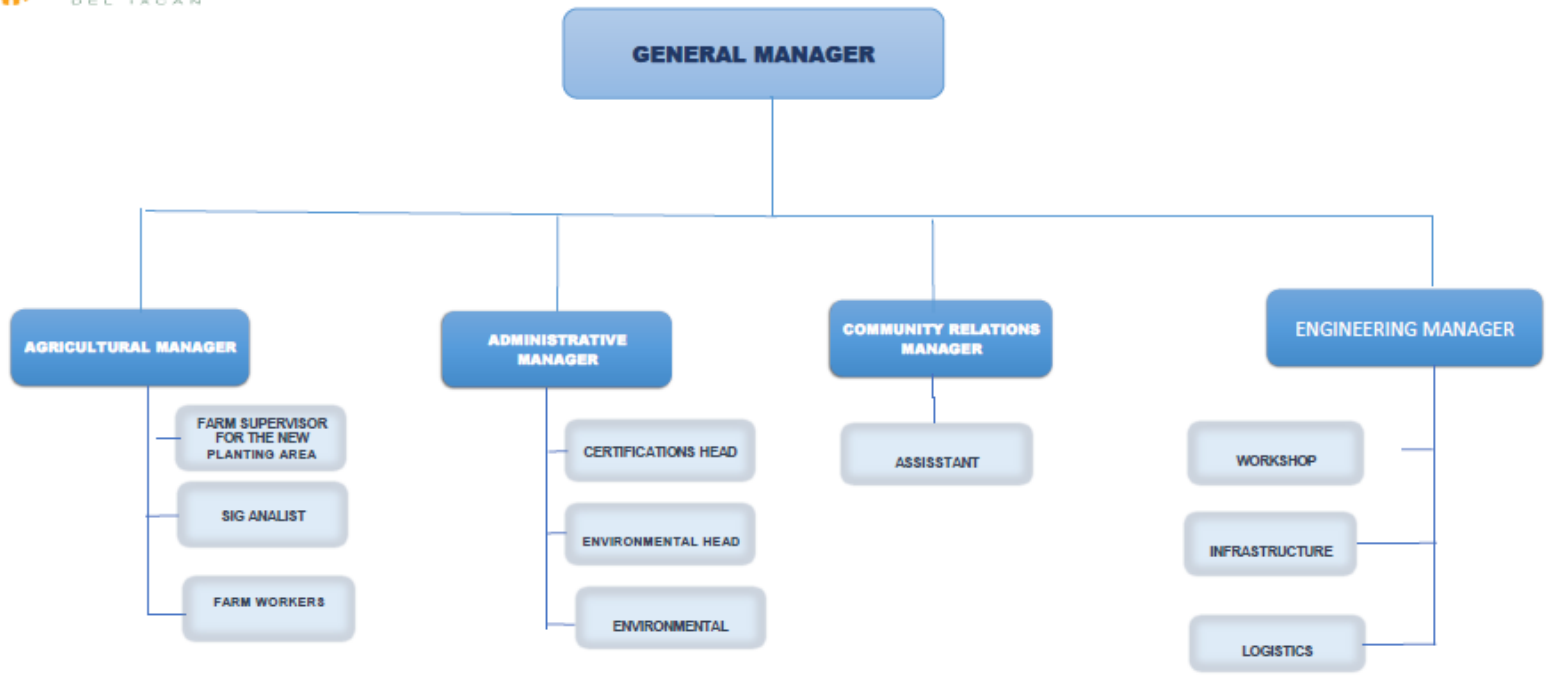
- **Responsible team of the monitoring plans.**

The team responsible for monitoring the plans, is the team of the company Palmas del Ixcán, of different Departments within the company and that their work is related to the new plantings.

- Manager of the agricultural area.
- Manager of environmental and certifications department.
- Head of environmental management.
- Head of certifications.
- Assistants of environmental and certifications department.
- Community Relations Manager department.
- Infrastructure Department Manager.
- All employees

PALMAS DEL IXCAN

RESPONSIBLE TEAM FOR THE MONITORING PLANS



GENERAL MANAGER	Felix Alvarez Briz						
AGRICULTURAL MANAGER	Juan Alberto Lemus	**ADMINISTRATIVE MANAGER**	Luis Oliva	**COMMUNITY RELATIONS MANAGER**	Odilsar Cardona	**ENGINEERING MANAGER**	Walter Schlesinger
FARM SUPERVISOR	Benjamin Cuc Xo	CERTIFICATIONS HEAD	Ana Contreras	ASSISSTANT	Alfredo Xol	WORKSHOP	Valentin Capriel
SIG ANALIST	Joel Marco Garcia	ENVIRONMENTAL HEAD	Hugo Leonel Merida			INFRAESTRUCTURE	César Barrios López
		ENVIRONMENTAL ASSISTANT	Jorge López			LOGISTICS	Ever Leonel González

6.2 MANAGEMENT PLANS FOR THE HCV

SCHEDULE FOR PLANTING

Month / Location-year	District 2- year 2019
May	80 has
June	80 has
July	80 has
August	80 has
September	88.40 has

For the risk assessment, the process suggested by the generic guide for the identification of HCV was used (Brown et al., 2017). The definitions of Scale, Intensity and Risk of the generic guide are:

Scale: A measure of the degree to which a management activity or event affects an environmental or social value, or a management unit, in time or space. An activity with a small spatial scale affects only a small proportion of the area each year, while an activity with a small time scale occurs only at long intervals.

Intensity: A measure of the intensity, severity or pressure of a management activity or otherevents that affect the nature of the impacts of the activity.

Risk: The probability of an unacceptable negative impact resulting from any activity in the management unit combined with its seriousness regarding its consequences. (Brown et al., 2017).

Considering the above, the Scale of activities is a small scale, will not harm key areas for biodiversity or community areas or indigenous peoples. The total area of the properties destined to new plantations is370.75. ha, dispersed in two municipalities (Figure 1.1). The area range of the 62 evaluated properties ranges from 0.02 ha to almost 18 ha. Intensity of activities will be low, also there are already palm plantations with similar sizes and low intensity management is conducted. The risk was also classified low, however, a full and intense HCV assessment was developed to reduce the information gaps that could bias the findings. Although the risk of the present study is low, the lead assessor has a provisional license so, according to the manual for evaluations of AVC (Proforest 2015), the assessment is classified as Tier 1.

The threats were assessed using the methodology of the Threat Classification Scheme of the International Union for the Conservation of Nature (IUCN), version 3.2[1], as a guide. It focuses on direct threats that are ofanthropogenic origin that have impacted, are impacting or could impact the state of the element underevaluation (HCV in this case).
This list of threats[2] was taken as a reference only, since the participatory consultations and interviews with key actors identified the threats that the HCVs have and that are more closely linked to the context of the evaluation.
The interesting thing about the methodology is that these threats can be prioritized according to their level of impact (without impact, low, medium, high), so that at the same time, the proposed management measures for the conservation or improvement of HCV can be prioritized. Each threat is evaluated according to criteria of time, scope, and severity; Impacts are assessed from "no impact" to "high."

The time can be interpreted for a past, current or future threat; the scope refers to the portion of the affected HCV; and the severity is the general magnitude that affects some HCV. The options of each criterion are:

- Time
    - Only happened in the past, unlikely to happen again
    - In the past, but currently suspended and likely to happen again
    - Only in the future
    - Unknown

- Scope
    - Affects the entire area of the HCV (> 90%)
    - It affects most of the AVC area (50-90%)
    - Affects a smaller part of the HCV area (<50%)
    - or Unknown

- Severity
    - Cause or probable cause very rapid degradation of the AVC (> 30% in 10 years)
    - Cause or probable cause of rapid degradation of the AVC (20-30% in 10 years)
    - Cause or probable cause of slow but significant degradation (20% in 10 years)
    - Cause or probable cause of fluctuations
    - Cause or probable cause of negligible degradations
    - No degradation
    - or Unknown

The assessments of each threat are presented for each identified HCV, followed by the matrix of management and monitoring measures. It must be considered that the suggested management measures should be applied only in the properties destined to new plantations evaluated. Figures 4.1 to 4.4 show the HCV management areas, with which the Company can be spatially guided where these measures should be implemented.

[1] http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme consulted April 17 2017

[2] http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme. consulted April 17 2017

Table 4.1. Threats and value of identified impacts for each HCV.

			Value Criteria				
HCV	Value Descriptioon	Main Threat	Time	Scope	Severity	Total	Impact
HCV 1	RAP species in a fragmented and degraded landscape, with habitat limitations for their development. Survival of RTE populations dependent on sizes and quality of fragments of broadleaf forests that are critical for these species.	Hunting and extraction of wood from RTE species.	a	2	1	3	Medio
		Illegal extraction of RTE species for commercial purposes by collaborators or subcontractors of the Company	b	1	1	2	Low
		Degradation of habitat and diversity of RTE species due to lack of connectivity (or increase) and illegal logging.	a	2	1	3	Medium
		Forest fires reduce connectivity and fragments of RTE species	a	2	2	4	Medium
HCV 3	Broadleaved forest fragments are critical for biodiversity, RTE species, and genetic flow. In these landscapes they are fragile due to the degree of degradation they present, and in an agro-landscape that constantly threatens them. Wetlands or wetlands that can be habitat for RTE species. They are among the few wet areas in the landscape.	Clearances for land preparation in properties of new plantations.	a	2	2	4	Medium
		Displacement, competition and degradation of habitat by exotic species used in new plantations	b	2	3	5	Medium
		Forest fires reduce connectivity and fragments of RTE species	a	2	2	4	Medium
		Degradation of flood zones by installation of drainages	a	2	1	3	Medium
		Clearance of forested areas for the installation of infrastructure in properties (roads, warehouses, etc.)	b	1	2	3	Medium
HCV 4	Riparian or gallery forests that provide barriers or filters between crops and rivers. They prevent erosion and contamination of the water resource of sedimentation and other pollutants. They can function as corridors in the landscape and properties	Degradation of habitat and diversity of RTE species due to lack of connectivity (or increase) and illegal logging.	a	2	2	4	Medium
		Riparian zones without coverage increase by edge effect and reduce the ecosystem service	a	2	2	4	Medium
		Displacement, competition and degradation of habitat by exotic species used in new plantations	b	2	3	5	Medium

			Value Criteria				
HCV	Value Descriptioon	Main Threat	Time	Scope	Severity	Total	Impact
		Forest fires reduce connectivity and riparian forests	a	2	2	4	Medium
HCV 5	Rivers and streams that provide water to communities and other resources such as fishing and recreation, irrigation, domestic activities	Contamination by organic waste (compost), herbicides, or badly managed agrochemical containers	a	2	3	5	High
		Reduction / increase of levels of the resource by drainages in plantations	b	2	1	3	Medium
HCV 6	Site of religious baptisms used by population (La Esmeralda) as part of their culture. Value in the landscape and outside the properties of new plantations	Contamination of resources by solid waste and other pollutants from the town	a	2	3	5	High

Having the prioritized threats, the HCV management measures can also be executed with said prioritization by level of impact. That is, the management measures of HCV 5 and HCV 6, according to the previous assessment, could be executed as first steps if the Company has limited resources or wants to start with measures that have a greater impact on the "most threatened" HCVs. The rest of the threats are cataloged as having a MEDIUM impact and only a LOW impact threat. However, all measures must be addressed in order to protect, preserve and / or improve the identified HCVs.

Table 4.2. Identified HCVs, their threats, and management and monitoring recommendation in the HCV management areas

Properties code	HCV	Threats	Management Recommendations	Monitoring Recommendations
SP11, SP12, SP18, OP25, SP27 y SP2, EP29, EP57, EP58 y EP59, PP04, y MP22, QP21 a la QP30, QP32 QP33, QP37, QP36	HCV 1	Hunting and logging of RTE species Illegal extraction of RTE species with commercial purposes by workers or contractors of the Company.	• No hunting and no logging policy. Label area with prohibitions (Spanish and Q'echí). • Restrict or control access to areas with RTE species, control and surveillance • Sensitize the Company's collaborators and extend talks to communities of the broader landscapes on conservation of wild species, with special focus on RTE species.	• Protocol for monitoring RTE species of flora and fauna (indicator species), recording incidents (hunting, wood extraction) • Record of events or incidents in control and surveillance logs • Registration of training assistants. Communication with COCODE to perceive impacts of talks in communities

Properties code	HCV	Threats	Management Recommendations	Monitoring Recommendations
SP11, SP12, SP18, OP25, SP27 y SP2, PP04, y MP22, QP21 a la QP30, QP32 QP33, QP37, QP36, EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59, QP34, QP35, TP39	**HCV 1, 3, 4**	Degradation of habitat and diversity of RTE species due to lack of connectivity (or increase) and illegal logging.	• Retrieve degraded sites of fragments of broadleaved forest, by means of natural succession or intervention (restoration) (use local species, local seed of the same landscape patches) • Implementation of good biodiversity practices from the beginning or design of new plantations (maintain biological corridors, leave mature trees between planting areas (especially if they are RTE) when possible	• Successful monitoring protocol for recovery of sites in recovery (e.g. plots or aerial photography) • Register of local species used for reforestation • Registration and mapping of areas under recovery
SP11, SP12, SP18, OP25, SP27 y SP2, PP04, y MP22, QP21 a la QP30, QP32 QP33, QP37, QP36, EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59, QP34, QP35, TP39	**HCV 1,3,4**	Forest fires reduce connectivity and fragments of RTE species	• Prohibit fires in the area adjacent to HCV or the use of fuels without the corresponding precautions. Labeling and disclosure of regulations. • Sensitization and technical advice to neighbors to develop controlled burning in neighboring lands (preparation of corn and other crops) and avoid causing fires in areas of HCV. • Train collaborators in connate and fire management. Develop communication route to report incidents	• Control of training and communication with COCODE to investigate the impact of the trainings. • Registration of incidents due to uncontrolled burning or confinement in prohibited areas

Properties code	HCV	Threats	Management Recommendations	Monitoring Recommendations
SP11, SP12, SP18, OP25, SP27 y SP2, PP04, y MP22, QP21 a la QP30, QP32 QP33, QP37, QP36, EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59, QP34, QP35, TP39	**HCV 3, 4**	Clearances for land preparation in properties of new plantations. / Clearing forest areas for the installation of infrastructure in properties (roads, warehouses, etc.)	• Develop plantation design considering the presence of HCV, LUCA and other studies that indicate suitable areas for planting • Disclose policy of zero clearings of broadleaved forests to contractors and collaborators	• Supervise that design addresses HCV zones.
SP11, SP12, SP18, OP25, SP27 y SP2, PP04, y MP22, QP21 a la QP30, QP32 QP33, QP37, QP36, EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59, QP34, QP35, TP39	**HCV 3, 4**	Displacement, competition and degradation of habitat by exotic species used in new plantations	• As far as possible, inquire about the use of native and local species as biological control, nectariferous, soil cover, before exotic species. • Control of exotic species (cutsu, beneficial weeds, bamboo, etc.), by manual, mechanical and, ultimately, chemical means. • In the development of the plantation, control the possible dispersion of palm oil in natural areas (whether or not, HCV)	• Record success of native and local species as biological control, nectariferous, soil cover • Include in flora and fauna monitoring protocol, a component of areas with presence of exotic species (including oil palm in natural areas -where they were not sown-)
EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y	**HCV 4, 5**	Degradation of humid zones by installation of drainages / Reduction / increase of levels of	• Develop design of plantations considering HCVs. Drainages should avoid drain into HCV areas.	-No recommendations

Properties code	HCV	Threats	Management Recommendations	Monitoring Recommendations
EP59, MP22, QP21 a la QP30, QP32 QP34, QP35, QP37, TP39		the resource by drainages in plantations		
EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59, MP22, QP21 a la QP30, QP32 QP34, QP35, QP37, TP39	**HCV 4**	Riparian zones without coverage increase by edge effect and reduce the ecosystem service	• In degraded riparian areas, recover conservation zones by means of passive (natural succession) or active (reforestation) measures according to the Company's capacities. Strip of conservation must be according to guidelines of the national legislation, or the recommendations of the national interpretation of the P&C of the RSPO. • Use local species, local seed of the same fragments of the landscape -Measure also described in HCV 1-	• Monitoring protocol to measure success recovery of sites (e.g. plots or aerial photography) • Register of local species used for reforestation • Registration and mapping of areas under recovery
EP29, EP30, EP40, EP41, EP48 al EP53, EP57, EP58 y EP59, MP22, QP21 a la QP30, QP32 QP34, QP35, QP37, TP39	**HCV 5, HCV 6 (only at landscape level)**	Contamination by organic waste (compost), herbicides, or badly managed agrochemical containers	• Applications should not be made at a distance of at least two rows of palms from their riparian zone (based on prohibited areas for plantations). It can be supported in the conservation riparian areas established in the national legislation (health code decree 90-97, article 84.) or by the recommendations in the NI of the P & C of the RSPO. • Delimit or mark limit of area of applications (two rows of palm before any source of water and its riparian zone) • Prohibit the washing of pumps from applications in rivers. • Applications at the right season (avoid rainy season)	• Supervise chemical applications • Register in the Good Agricultural Practices Log de BPA y cultural management (no chemicals) in the riparian zones and rivers.

Properties code	HCV	Threats	Management Recommendations	Monitoring Recommendations
			• Advise community members of La Esmeralda on good agricultural practices (previous bullet points), which supports the conservation of HCV 6 that is in the wider landscape (Landscape 3), outside the properties	

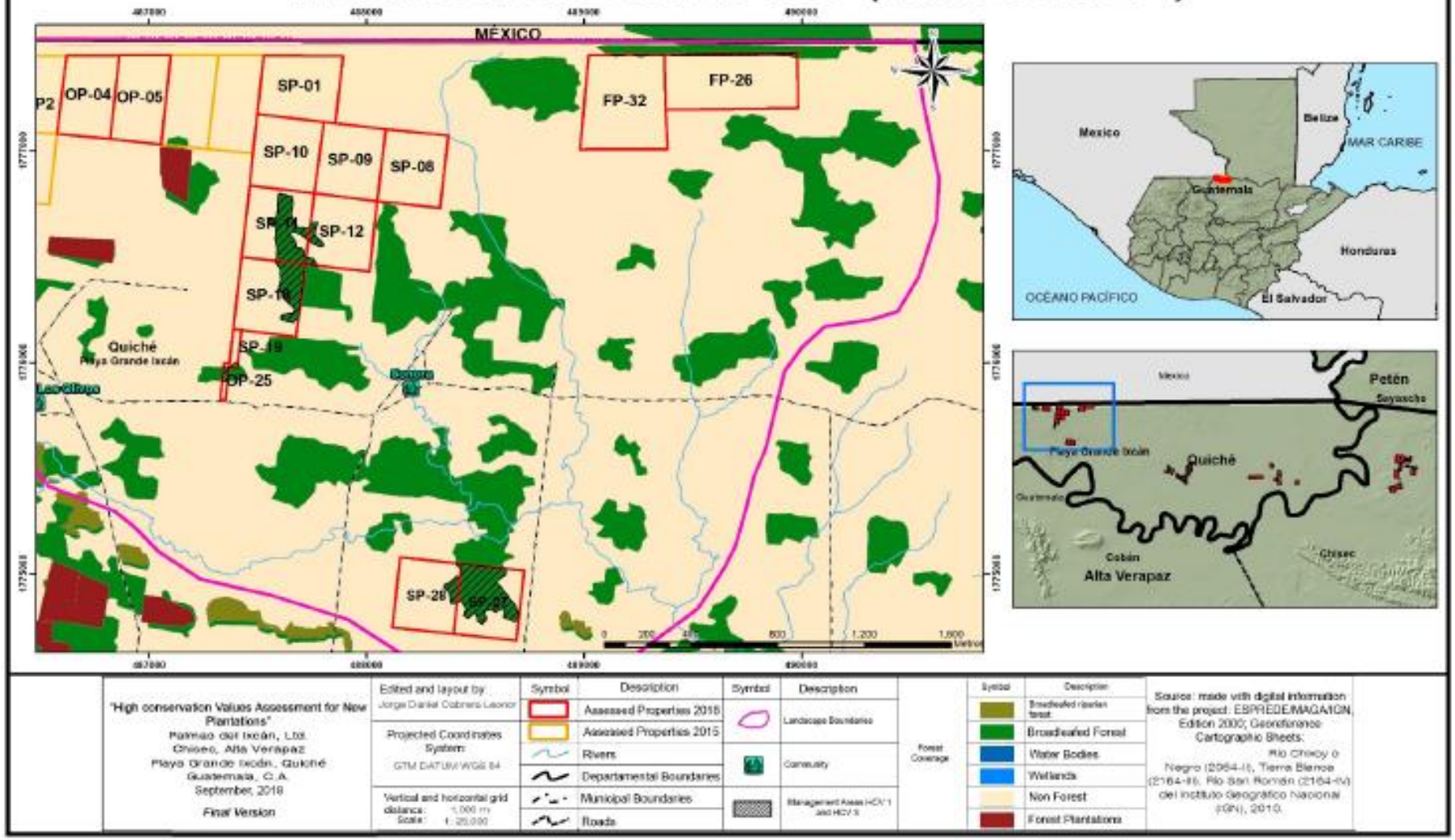
In total, the HCV management area of HCV 1, 3, 4 and 5 within the properties destined to new plantations is of 96.8967 ha, excluding duplications resulting form overlaps. We also clarified that the areas of HCV 1 and HCV 3 are the same in Landscape 1, the others differ because the flood zones in these landscapes are also HCV 3. As for HCV 4 is calculated considering a buffer zone of 25 m at each side of the rivers, as a riparian conservation area. The same calculations were made for HCV 5, where the 25 m buffer zone of each side of each river was defined as the management areas.
Thus, the management area for HCV 4 and HCV 5 are the same. This zone may increase depending on the disposition that the Company applies, that is, using this criterion of the national legislation or of the NI of the RSPO standard. Table 4.3 shows the management areas by HCV, by landscape. The HCV 6 is in Landscape 3, but because it is outside the properties of new plantations there is no management area determined.

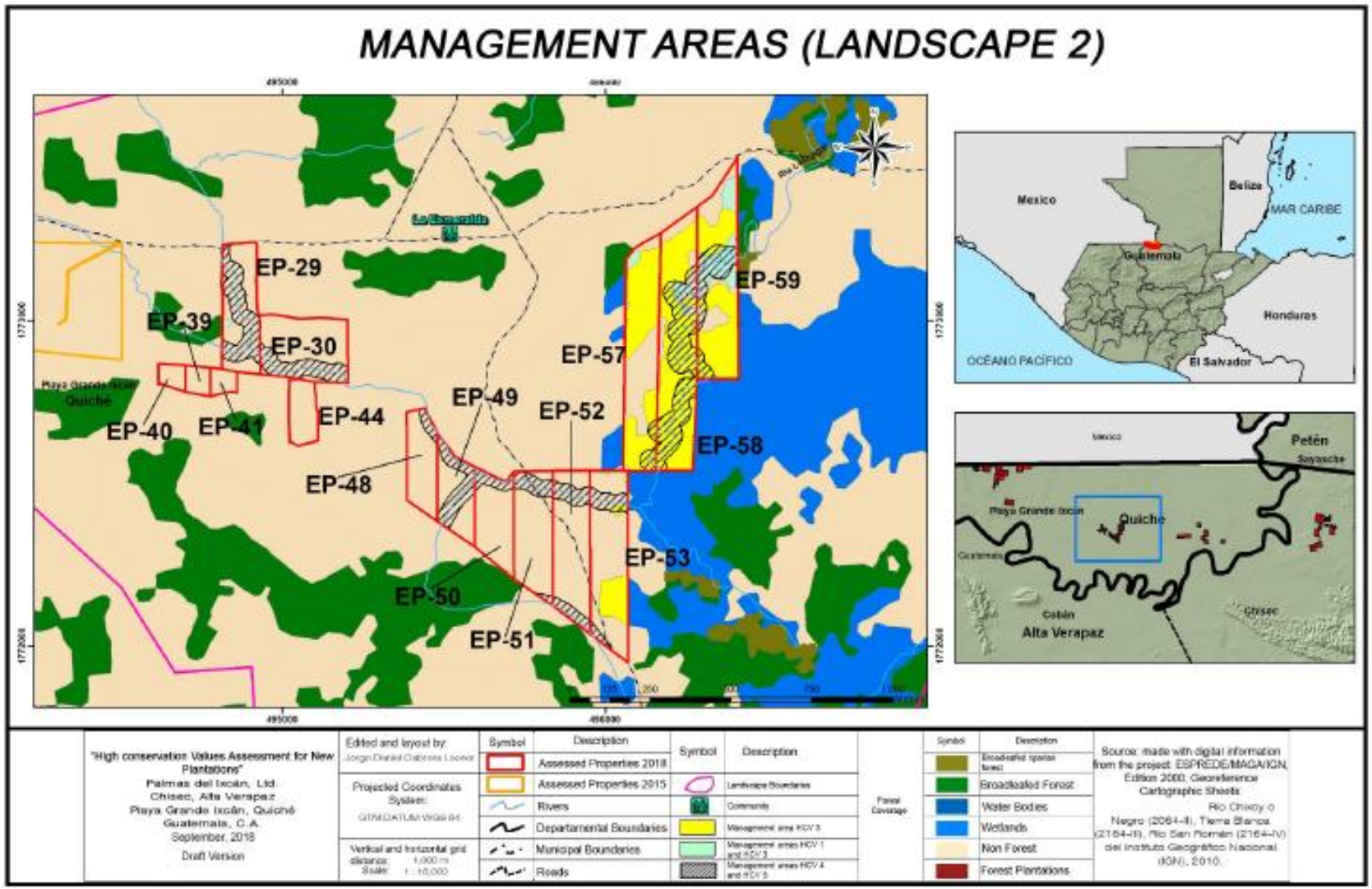
Nonetheless, recommendations in advising the community of La Esmeralda in good practices, can strengthen this value's conservation.

Table 4.3. HCV areas and HCV management areas (HCVM) per wider landscape.

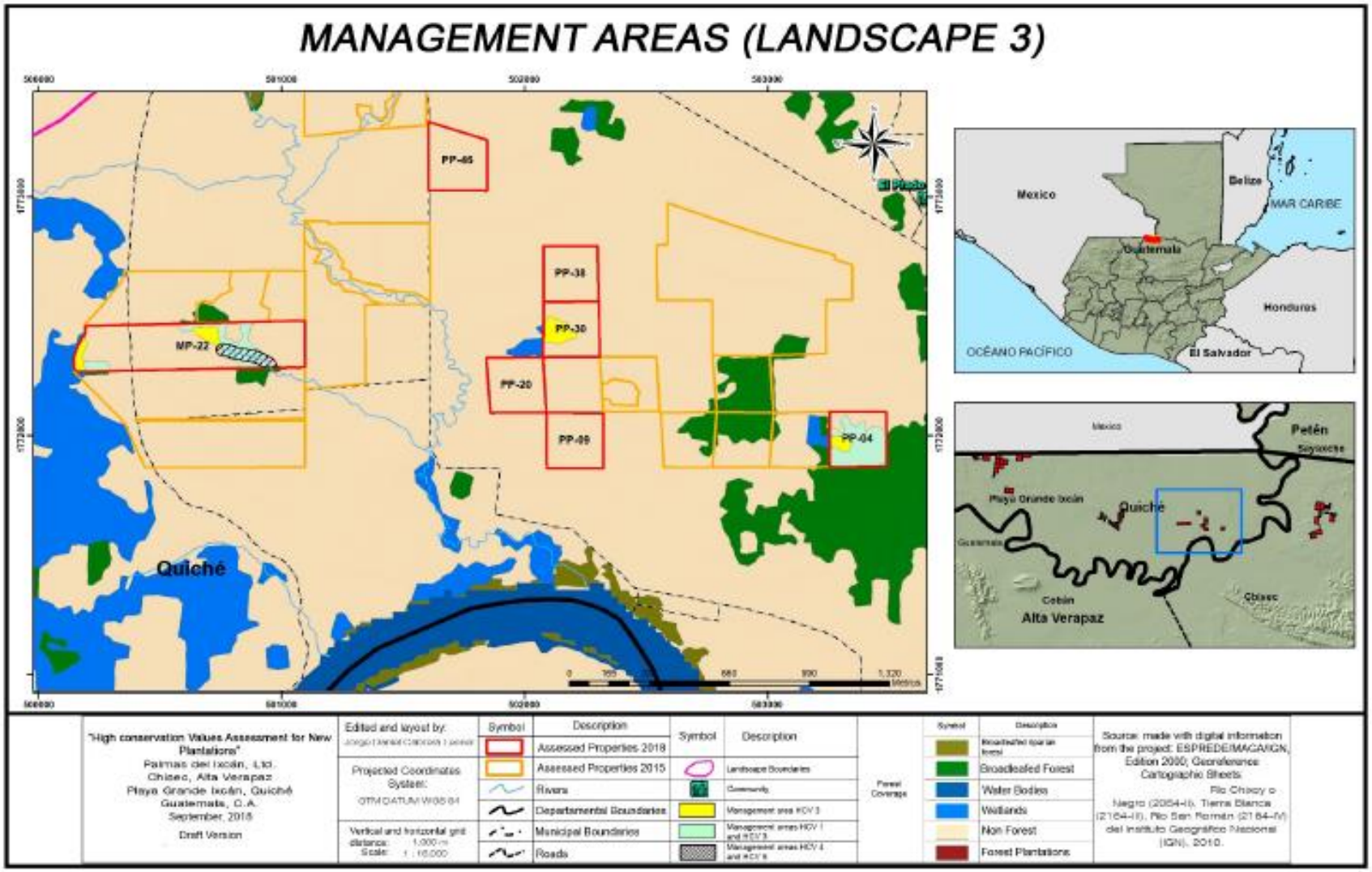
Landscape	HCV 1 (Hectares)	HCVM 1 (Hectares)	HCV 3 (Hectares)	HCVM 3 (Hectares)	HCV 4 (Hectares)	HCVM 4 (Hectares)	HCV 5 (Hectares)	HCVM 5 (Hectares)	HCV Management Area Map
Landscape 1	12.4603	12.4603	12.4603	12.4603	0	0	0	0	Figure 4.1
Landscape 2	2.2094	2.2094	19.5809	19.5809	14.8234	14.8234	1.0038	14.8234	Figure 4.2
Landscape 3	6.4561	6.4561	9.0598	9.0598	1.2099	1.2099	0.0674	1.2099	Figure 4.3
Landscape 4	29.5231	29.5231	35.1501	35.1501	4.6123	4.6123	0.2363	4.6123	Figure 4.4
TOTAL	50.6489	50.6489	76.2511	76.2511	20.6456	20.6456	1.3075	20.6456	

MANAGEMENT AREAS HCV (LANDSCAPE 1)




MANAGEMENT AREAS (LANDSCAPE 2)
EP-29
EP-39
EP-30
EP-57
EP-59
EP-49
EP-52
EP-44
EP-40
EP-41
EP-58
EP-48
EP-53
EP-50
EP-51
Playa Grande Ixcán
Quiché
La Ramonita
Mexico
Belize
MAR CARIBE
Guatemala
Honduras
OCÉANO PACÍFICO
El Salvador
Petén
Sayaxche
Quiché
Cobán
Alta Verapaz
Chisec
"High conservation Values Assessment for New Plantations"
Palmas del Ixcán, Ltd.
Chisec, Alta Verapaz
Playa Grande Ixcán, Quiché
Guatemala, C.A.
September, 2018
Draft Version
Edited and layout by:
Projected Coordinates System:
Vertical and horizontal grid distance:
Scale:
Symbol
Description
Assessed Properties 2018
Assessed Properties 2015
Rivers
Departamental Boundaries
Municipal Boundaries
Roads
Landscape Boundaries
Communities
Management area HCV 3
Management areas HCV 1 and HCV 3
Management areas HCV 4 and HCV 5
Forest Coverage
Broadleaved sparse forest
Broadleaved Forest
Water Bodies
Wetlands
Non Forest
Forest Plantations
Source: made with digital information from the project: ESPREDE/MAGA/IGN, Edition 2000. Georeference Cartographic Sheets:
Río Chixoy o Negro (2064-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

MANAGEMENT AREAS (LANDSCAPE 3)



"High conservation Values Assessment for New Plantations"
Palmas del Ixcán, Ltd.
Chisec, Alta Verapaz
Playa Grande Ixcán, Quiché
Guatemala, C.A.
September, 2015
Draft Version

Edited and layout by:

Projected Coordinates System:
UTM DATUM WGS 84

Vertical and horizontal grid distance: 1,000 m
Scale: 1 : 15,000

Symbol	Description
	Assessed Properties 2018
	Assessed Properties 2015
	Rivers
	Departamental Boundaries
	Municipal Boundaries
	Roads

Symbol	Description
	Landscape Boundaries
	Community
	Management area HCV 3
	Management areas HCV 1 and HCV 3
	Management areas HCV 4 and HCV 6

Forest Coverage

Symbol	Description
	Broadleafed riparian forest
	Broadleafed Forest
	Water Bodies
	Wetlands
	Non Forest
	Forest Plantations

Source: made with digital information from the project: ESPREDEMACARIGN, Edition 2000; Georeference Cartographic Sheets: Río Chixoy o Negro (2054-II), Tierra Blanca (2164-III), Río San Román (2164-IV) del Instituto Geográfico Nacional (IGN), 2010.

6.3 Grennhouse gases evaluation

Plan that indicates the carbon stocks and the presence of the peat soils were the new project will be developed and conserved

During the development of new plantings in Palmas del Ixcán, 405.64 hectares of palm oil will be planted and 2.76 hectares will be destined to the conservation of secondary forest. Natural forest will not be removed in any area and it will be maintained after the palm crops are planted.

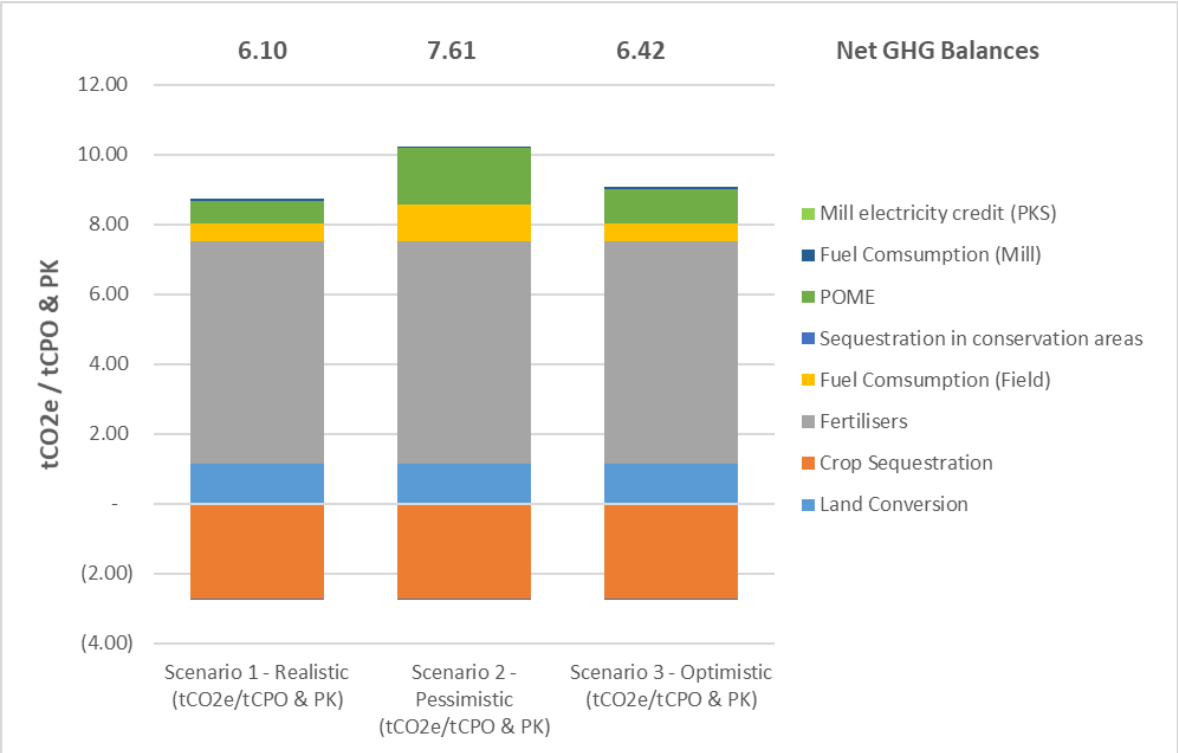
Currently the only carbon stocks present are the secondary forest of the area (the forest will be maintained after the plantings), grasslands, perennial crops and shrubbery (405.64 ha of palm oil will be planted area). As a consequence that palm oil stocks more carbon than grasslands, shrubbery and perennial crops, it is expected that once the project is implemented the amount of carbon stocks will rise.

Regarding the peat soils, it has been identified that there is no presence of such soil in the territory of Guatemala as mentioned before in the general methodology of the project (MAGA states there are no Histosols in Guatemala).

GHG emissions scenarios

Three different settings of Greenhouse Gas emissions have been developed for the company Palmas del Ixcán. The results and the settings are presented below in the model:

Figure 14. Scenery for the development of new plantations, Palmas del Ixcán



Source: Green Development based on New Development GHG Calculator RSPO, 2017.

Table 8. GHG emission scenery description, New Plantings –Palmas de Ixcán-

Type of scenery	Description of scenery
Scenery 1 (Realistic)	The vegetable coverage is removed for the palm oil plantings, the area removed is currently covered by grasslands, perennial crops and shrubbery. Regarding the water treatment, 40% of the effluent coming from the Palm Oil Mill will be sent to treatment and 60% will be sent directly to the composter. This procedure is currently taking place in the company, so the methodology will remain the same. The areas pf natural forest will be conserved and there will be no clearance in said areas by palm oil planting or nearby communities. All areas of natural forest will be preserved in the same state and maintained.

	Total area of planting = 405.64hectares (99.32 %) Total area of conservation = 2.76 hectares (0.68 %)
Scenery 2 (Pessimistic)	The vegetable coverage is removed for the palm oil plantings, the area removed is currently covered by grasslands, perennial crops and shrubbery. Regarding the water treatment, 100% of the effluent coming from the Palm Oil Mill will be sent to treatment because the composter can maintain its functionality from the effluent coming from the existing production (before new plantings). The amount of fossil fuels in the field will be augmented and used to its full capacity because of the climate conditions in the rainy season. It will be necessary the complete mobility of trucks and vehicles to facilitate the work during production. The carbon stocks of the conservation areas will diminish to 80% (0.55) due to fires and wood exploitation by nearby communities (this is a problem that can be suffered eventually). Total area of planting = 405.64 hectares (99.32%) Total area of conservation = 0.55 hectares (20%) Cleared area due to fires or wood exploitation = 2.21 hectares (80%)
Scenery 3 (Optimistic)	The vegetable coverage is removed for the palm oil plantings, the area removed is currently covered by grasslands, perennial crops and shrubbery. Regarding the water treatment, 60% of the effluent coming from the Palm Oil Mill will be sent to treatment and the remaining (40%) will be sent directly to the composter. Production will be greater with the new plantings so it is expected a larger amount of effluent. Although, the composter will produce

	the same amount of product so an increase in the amount of water won´t be needed. The areas of natural forest will be conserved and there will be no clearance in said areas by palm oil planting or nearby communities Total area of planting = 405.64 hectares (99.32%) Area of conservation = 2.76 hectares (0.68%)			
		Scenery1 (tCO_{2e}/tFFB)	Scenery 2 (tCO_{2e}/tFFB)	Scenery 3 (tCO_{2e}/tFFB)
Cleared area	Grasslands	22.174 hectares (5.43%)	22.174 hectares (5.43%)	22.174 hectares (5.43%)
	Perennial crops	199.5671 hectares (48.87%)	199.5671 hectares (48.87%)	199.5671 hectares (48.87%)
	Shrubbery	183.89 hectares (45.03%)	183.89 hectares (45.03%)	183.89 hectares (45.03%)
	Forest (fires or wood exploitation)	0	2.21 hectares (0.54%)	0
Conserved area	Secondary forest	2.76 hectares (0.68%)	0.55 hectares (0.13%)	2.76 hectares (0.68%)
Treatment of the Palm Oil Mill Effluent (POME)	Effluent Deviated to composter	60 %	0	40%
	Treated effluent	40 %	100%	60%
GHG Balance (tCO_{2e}/tCPO & PK)		6.10	7.61	6.42

Source: Green Development, 2017.

Table 9. GHG Emissions Summary, New Plantings –Palmas de Ixcán-

Sources of emission/absorption	Scenery 1 (Realistic) (tCO_2e/ tCPO, tPK)	Scenery 2 (Pesimistic) (tCO_2e/ tCPO, tPK)	Scenery 3 (Optimistic) (tCO_2e/ tCPO, tPK)
Land Conversion	1.14	1.141	1.14
Crop Sequestration	-2.73	-2.728	-2.73
Fertilisers	6.37	6.369	6.37
Fuel Comsumption (Field)	0.53	1.056	0.53
Sequestration in conservation areas	-0.01	-0.002	-0.01
POME	0.64	1.612	0.97
Fuel Comsumption (Mill)	0.06	0.058	0.06
Purchased Electricity	0.10	0.101	0.10
Mill electricity credit (PKS)	-	-	-
GHG Balance	**6.10**	**7.61**	**6.42**

Source: Green Development, 2017.

Unitary emissions consist on total emissions of carbon dioxide equivalent for each product produced. The emissions sources on Green House Gases assessment should be taken with a plus sign (+), carbon sinks on the other hand should be quantified with a minus sign (-); the sum of these data are the balance between emissions sources versus carbon stock, if the result of this sum is positive that indicates there are more units of GHG emissions than carbon units fixation, if the result obtained is negative this indicates that there are more units of carbon fixation than the ones emitted during production process.

It's important to clarify results obtained in table 5, 6, 7 and 9 and to identify the existent differences. According to table 5, for each ton of Crude Palm Oil (CPO) or Palm Kernel (PK) produced, there's going to be a total of carbon emission of **6.10 tCO_2e**. This result was obtained by multiplying total emissions expected by the equivalent allocation of FFB and PK emissions to crop products by mass, in other words the percentage of FFB emissions attributable to CPO (85.9% for this case) and PK (14.1%), according to extraction rates (13.40% OER, 2.20% KER) and annual expected productions tons of CPO (1,113.47) and PK (186.09).

The data shown on table 6, is the summary of field emissions and sinks in tCO_2e (6,992.45), it also shows tCO_2e per hectare (18.19) and tCO_2e per ton of expected FFB production (0.83). The most significant emissions sources from field will be the utilization of fertilizers. The significant carbon´s sinks will be the crop and conservation of degraded forest areas.

In the other hand on table 7 are the summary of mill emissions and sinks sources in tCO_2e (1,060.06), it also shows tCO_2e of mill expected per hectare (2.76) and tCO_2e of mill per ton of expected FFB production (0.13). One of the significant emission sources from mill will be POME generated in degradation process of organic compounds in effluents. There is no credits on internal utilization of biomass for energy production.

Table 9 presents the data summary of the three possible scenarios also planted on table 8. This table shows emissions and sink sources expected and integrated from field and mill. It can be proved that the sum of unitary emissions of tCO_2e/tCPO,tPK from mill and field at the first scenario will consist in 6.10 tCO_2e/tCPO,tPK.

9.4 **Summary of Optimistic Scenery**

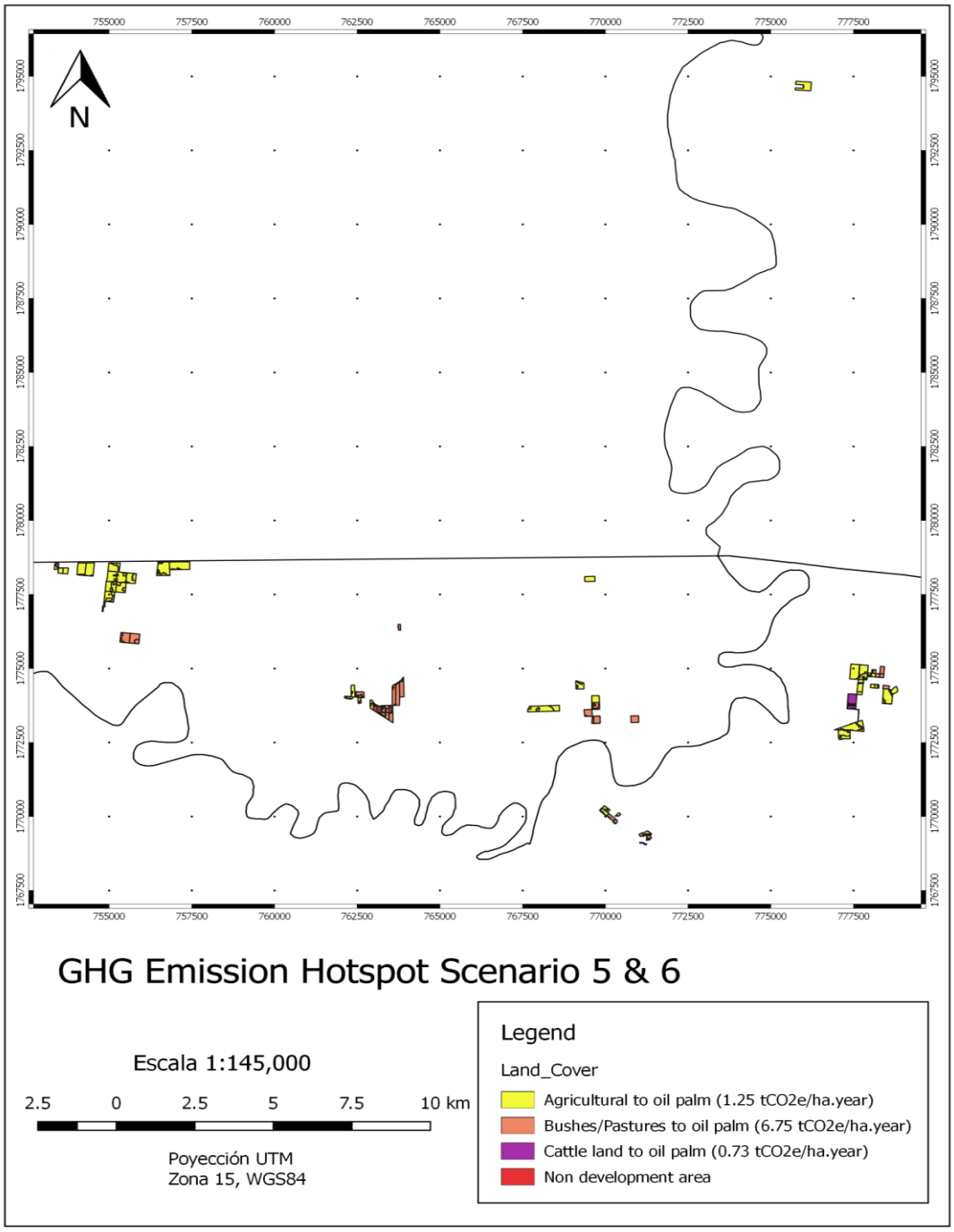
Considering the obtained results, scenery 1 has been selected as optimal for the development of new plantings of Palmas del Ixcán. An explanation of why the scenery was chosen is presented below:
The areas where it is foreseen to plant palm oil are currently covered in grasslands, perennial crops and shrubbery. There will be no forest clearance in the existing vegetable areas such as forests or other areas of influence. Also, there will be no forest clearance in areas that can affect the connectivity of ecosystems like river areas.

Currently the company sends only 40% of its effluent top treatment and the remaining 60% is used to produce compost. The composter system has the capacity to treat the effluent of the new plantations because its design contemplated the growth of the company. Therefore, although the production rises, the conditions of the effluent will remain the same.

The forest area takes up 2.76 hectares and there is no plan to increase the number of hectares. This is because the areas are the only ones around the estate where the new plantings will be taking place. Nevertheless, the company will develop a plan to maintain the totality of the forest areas and guarantee that in the long term they become a carbon stock. Said plan will include training and awareness to the nearby communities and collaborators about the importance of decreasing the wood exploitation and the hunting of wild animals making the forest areas not sustainable.

It is expected that the amount of fossil fuels consumed in field activities and extracting plant stays with the same numbers presented in the scenary. This is because the data of fuel consumption was compared to the use of fossil fuel in estates with similar land extensions. The use of fertilizer was also calculated per hectare so it is expected that the amount won´t rise either. The application of organic compost may decrease the use in fertilizer.

Figure 15. New development plan of Palmas del Ixcán



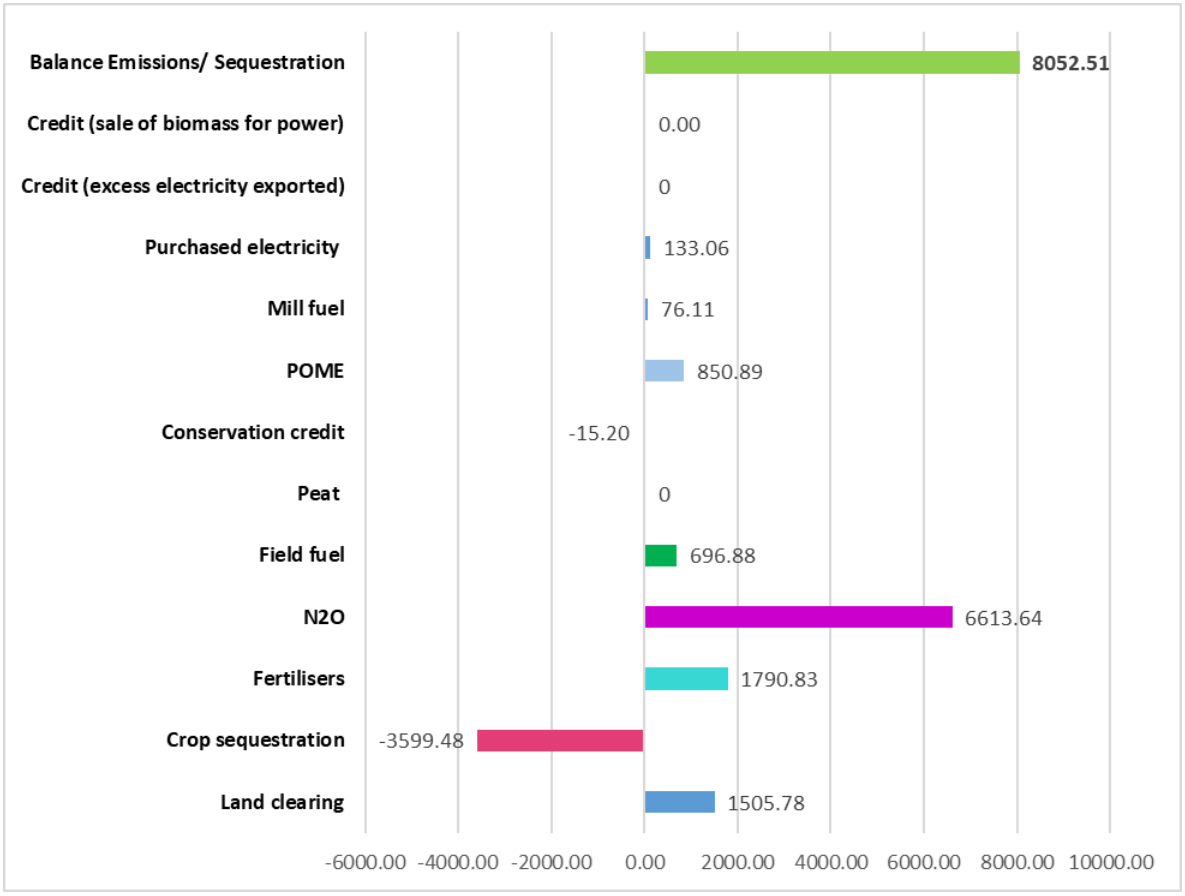
Source: Green Development, 2017

Table 10. Final GHG projection, New Plantings 2018

Sequestration/Emission focus	Projected Emissions (tCO_2e/tFFB)
Land Conversion	0.14
Crop Sequestration	-2.73
Fertilisers	6.37
Fuel Comsumption (Field)	0.53
Sequestration in conservation areas*	-0.01
POME	0.64
Fuel Comsumption (Mill)	0.06
Purchased electricity	0.10
Millelectricity credit (PKS)	--
Balance de GEI	**6.10**

**RSPO's default carbon sequestration value for Latin America*

Figure 16. Summary of GHG Emissions for New Plantings of Palmas del Ixcán (tCO_2e)



Source: Green Development, 2017.

MANAGEMENT AND MITIGATION PLANS FOR CARBON STOCKS AND GREENHOUSE GAS EMISSIONS

Measures adopted to maintain and improve the carbon stocks in new plantations

In the Identification and Estimation of Carbon Stocks section it was established that the existing areas of development are composed of cattle lands, agricultural and bushes with an extension of 405.64 hectares and 2.76 hectares of degraded forest or secondary forest in District 2 of Palmas del Ixcán. Palm oil plantings are destined to areas where there is no secondary or degraded forest, these areas will remain intact. The measurements implemented to preserve the forest can be observed below

MEASUREMENT 1	Maintenance and preservation of forests
ACTING AREA	Conservation areas (natural forests)
DEPARTAMENT IN CHARGE	Environmental Management
TERM	Short
OBJECTIVE	Maintain and improve the areas of conservation in the new project of new plantings.
DESCRIPTION	Palmas del Ixcán has 2.76 hectares destined for forest conservation in the developing area of new plantings. The following actions will be taken to conserve said forests: • No activities should take place in forests. • Continuous monitoring by the forest ranger of the company • There should be a plan to reforest with native species to maintain the forest in case of any invasion or fire. • Develop a no Wood exploitation, no hunting or degradation of flora and fauna awareness program with nearby communities.

10.2 Adapted measurements to mitigate net GHG emissions associated with the cultivation and processing of palm oil

The company Palmas del Ixcán has the objective to reduce its emission and has decided to implement different measurements to have a more efficient fuel consumption for the machinery; preventive maintenance of the machinery and motors, and in a long term have a biogas sequestration system from the effluent produced. Measurement to mitigate emissions are detailed below:

MEASUREMENT 1	Efficiency in the trucks for the transport of fruit
ACTING AREA	Fuel Consumption
DEPARMENT IN CHARGE	Transport
TERM	Short-Median
OBJECTIVE	Diminish the fuel consumption in trucks used to transport fruit.
DESCRIPTION	To have an efficient fuel consumption for the field machinery, the following measurements will be implemented: • Maintenance of the vial infrastructure to shorten the distance between estates and the mil; maintenance to improve time, circulation and fuel efficiency • Better control in the truck cargo. • Have a one-way trip were fruit is delivered from District 1 to 2 and compost is brought back from District 2 to 1. • Implement an extracting plant in District 1 to shorten transport and make efficient the use of fossil fuels.

MEASUREMENT 2	Implementation of a program that foresees preventive maintenance and changes for machinery.
ACTING AREA	Transport
DEPARTMENT IN CHARGE	Transport
TERM	Short
OBJETIVO	Have an adequate maintenance and renovation of machinery to accomplish a more efficient fuel consumption.
DESCRIPCIÓN	The company Palmas del Ixcán is aware that although the machinery has a constant maintenance, the fuel efficiency of said machinery must be very high. Therefore, the following actions will be taken to reduce emissions: • Buy new machinery after proving that the new ones will have a more efficient fuel consumption • Established and controlled maintenance to ensure long term efficiency.

MEASUREMENT 3	Fertilizers
ACTING AREA	Palm oil plantings
DEPARTMENT IN CHARGE	Agricultural
TERM	Short – Median
OBJECTIVE	Utilize organic fertilizer in the new plantings of Palmas de Ixcán.
DESCRIPTION	Due to the nature of the company´s work, fertilizers represents a very high emission source on their carbon footprint. Hence, Palmas del Ixcán will produce organic compost, made from the empty fruit bunches and a percentage of mill effluent. The sub products produced by the new plantings will contribute to the decrease on emissions provoked by the use of fertilizers. Therefore, the following actions will be taken to diminish the emissions caused by fertilizers: • Utilization of organic fertilizer to reduce up to 25% of emissions of nitrogenous fertilizers after the third year of use • Optimized used of nitrogenous fertilizer to comply with better agricultural practices

MEASUREMENT 4	Effluent
ACTNG AREA	Environment
DEPARMENT IN CHARGE	Environment
TERM	Long
OBJECTIVE	Diminish the emissions that come from the mill effluent.
DESCRIPTION	Mill effluents represent a significant source of emission in the new plantings of Palmas del Ixcán. If a percentage of the same effluent will be used for composting, the following has been considered: • Implement a biogas capture system for the generation of energy and the reduction of emissions by mil effluents.

Monitoring plan for the implementation of the setting chosen for the new development. The setting should include measurements to improve the carbon stocks and reduce GHG emissions to a minimum

The surveillance of the fulfillment of the emission mitigation measures, the preservation of the carbon stocks and the implementation of the setting selected for the new development will take place once the new plantings project of Palmas del Ixcán Limitada begins.

Objective:

Maintain a fulfillment control of all the GHG emission mitigation measures, preservation of carbon stocks and the development of the expected setting for the new plantings project of Palmas del Ixcán.

Types of measures:

A monitoring plan is presented below for the implementation of the optimal setting, the conservation of the carbon stocks and the reduction of GHG emissions in the new plantings of Palmas del Ixcán:

Table 11. Monitoring Plan, New Plantings –Palmas de Ixcán-

Measurement	Monitoring	Frequency
Mill effluent sent to composter	This will be verified by the measurement of the flow; the percentage sent to treatment and the percentage sent to the composter; to fulfill the required setting.	Quarterly
Electricity generation by palm kernel Shell (PKS)	There will be a control of how much fiber is sent to generate electricity for the plant	Monthly
Fuel consumption of the extracting plant	The machinery will be monitored to verify the preventive maintenance it should have to improve its efficiency	Quarterly
Preservation of conservation areas (forests)	The forest will be monitored to ensure and verify there is no deterioration	Monthly
Field fuel consumption	Roads will be monitored and maintenance to improve time, circulation and fuel efficiency	Biannual
Field fuel consumption	A cargo control will be established for trucks that move from District 1 to 2	Monthly
Preventive maintenance for machinery	Machinery will have a preventive maintenance to get more efficient in fuel utilization	Quarterly
Use of organic fertilizers	There will be a control of the organic fertilizers applied	Annually

7 INTERNAL RESPONSIBILITY

XI. INTERNAL RESPONSIBILITY

ACCEPTANCE OR RESPONSIBILITY BY THE COMPANY THAT DEVELOP GHG ASSESSMENT

Green Development Company, dedicated to environmental consulting and generating business models from environmental tools, led by Mr. Amilcar Ordoñez who is certified to ISO 14064:2006 standards and DIN EN 16001: 2009-08 (No. AI-EESA-002-11) and has worked on certifications for AENOY and TÜv Rheinland, takes full responsibility for the content of this report.

Ing. Amilcar Ordoñez
Green Development

ACCEPTANCE OF RESPONSIBILITY FOR ASSESSMENT AND MANAGEMENT AND MITIGATIN PLANS

By this declaration, I take full responsibility of the content of this report that includes the management and mitigations plans.

Inga. Flor de María Marroquín
Green Development assessor

ACCEPTANCE OF RESPONSIBILITY BY THE COMPANY

By the company Palmas del Ixcán Limitada, I take responsibility for this report,

Ing. Ana Contreras
Head of Certifications
Palmas del Ixcán Limitada

Responsibility for the HCV.

5. Statement of acceptance of responsibility

This Public Summary contains information of the full High Conservation Assessment commissioned by Palmas del Ixcan, Ltd., for new plantation areas with a total extension of 370.75 ha. The lead assessor is responsible for the document's content and it reflects the findings of the full assessment. Palmas del Ixcan, Ltd. is aware of the report and has accepted the findings and will implement the recommended management activities.

Both parties sign by mutual consent,

José Luis López L.
Lead Assessor

Luis Oliva
Chief administrator, Palmas del Ixcan, Ltd.

8 CONCLUSION

In compliance with the requisites of RSPO for new plantings of palm oil, a Greenhouse Gas Evaluation must be done. The results presented in this report have detailed information of each evaluation.

a. The Greenhouse Gas Evaluation was completed by Green Development, a company of environmental consulting; who has developed, embodied and communicated in this manner.

b. The Greenhouse Gas Evaluation was done according to the RSPO New Plantings Procedure (NPP), Version 4.3 July 2015.

c. It has been estimated that the amount of carbon stocked by the forest reservoirs of the new plantings ascends to a total of -15.20 tCO_2e.

d. The emission and sink sources of Greenhouse Gases were estimated for the new plantings project. On the emission sources, the following can be found fertilizers applied, land use change, fuel consumption on the field and mill and mill effluent. The significant sinks and carbon sequestration sources consists in conservation areas and palm cultivation.

e. It has been determined that the most significant emission source for the new plantings project could be the fertilizer utilization with around 8,404 tCO_2e and the most significant carbon sinks will be in crop sequestration with -3,599.48 tCO_2e.

f. A management plan was developed for the carbon stocks and GHG emissions. It was determined that the optimal Scenery is number 1 (Realistic) because it adapts to the current development conditions of Palmas del Ixcán.

9. BIBLIOGRAPHY

Agus, F., Henson, I.E., Sahardjo, B.H., Harris, N., van Noordwijk, M.& Killeen, T.J. 2013a. Review of emission factors for assessment of CO2 emission from land use change to oil palm in Southeast Asia. In T.J. Killen & J. Goon (eds). Reports from the Technical Panels of the Second RSPO GHG Working Groupp, Roundtable on Sustainable Palm Oil - RSPO, Kuala Lumpur. Increased by 20% to allow for root biomass as per Mokany, K., Raison, R.J., Prokushkin, A.S. (2005), Critical analysis of root: shoot ratios in terrestrial biomes. Global Change Biology 12: 84096.

FAO. (2010). La gestión de los bosques ante el cambio climático. Roma, Italia.

Ministerio de Agricultura, Ganadería y Alimentación (MAGA). (2000). Mapa de Clasificación Taxonómica de los Suelos de la República de Guatemala. Memoria Técnica.

Ministerio de Ambiente y Recursos Naturales (MARN). (2015). Segunda Comunicación Nacional de Cambio Climático.

IPCC. (2007). Cambio Climático 2007 Informe de Síntesis Contribución de los Grupos de trabajo I, II y III al Cuarto Informe de evaluación del Grupo Intergubernamental de Expertos sobre el Cambio Climático [Equipo de redacción principal: Pachauri, R.K. y Reisinger, A. (directores de la publicación)]. IPCC, Ginebra, Suiza.

Centro de Estudios Ambientales de la Universidad del Valle de Guatemala -CEA-UVG- (2007). Avances de la medición de Carbono en Bosques, Plantaciones y Sistemas Agroforestales de Guatemala: Caracterización Vegetal y de Suelos de Bosques Secundarios en la Reserva de la Biósfera Maya en Petén. Guatemala.

Verified Carbon Standard (VCS). (2009). Vocabulario de reservas de carbono. Washington, DC.