

**SUMMARY REPORT
HIGH CONSERVATION VALUE ASSESSMENT
PT Hutan Ketapang Industri - Kabupaten Ketapang,
West Kalimantan Province**

**March – December 2017
Report prepared by PT Ata Marie and PT Ekologika
Consultants**



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COVER PAGE

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Assessment Location	:	Kendawangan sub-District, Ketapang District, Kalimantan Barat Province
Assessment Date	:	March-December 2017
Assessment Area	:	97.891,38 Ha (UPHHK-HTI)
HCV Management Area	:	37,569Ha (UPHHK-HTI)
Planned Land use or Current Landuse	:	Rubber Plantation

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ABBREVIATIONS AND TERMS

Adat	term used to describe that which is customary (such as ceremonies, dress and law) of a traditional culture
APL	Other Land Use (<i>Area Penggunaan Lain</i>)
CA	Preserve Nature (<i>Cagar Alam</i>)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered (<i>Kritis</i>)
DEM	Digital Elevation Model
EN	Endangered (<i>terancam punah</i>)
FSC	Forest Stewardship Council
GIS	Geographic Information Systems
HL	Protected Forest (<i>Hutan Lindung</i>)
HP	Permanent production Forest(<i>Hutan Produksi</i>)
HPT	Limited Production Forest (<i>hutan Produksi Terbatas</i>)
HPK	Production Forest for Conversion (<i>Hutan Produksi yang dapat dikonversi</i>)
IUCN	International Union for the Conservation of Nature
KBKT	High Conservation Area (<i>Kawasan Bernilai Konservasi Tinggi</i>)
KPNKT	High Conservatiion Value Management Area (<i>Kawasan Pengelolaan Nilai Konservasi Tinggi</i>)
Kab.	Regency (<i>Kabupaten</i>)
NKT	High Conservation Value (<i>Nilai Konservasi Tinggi</i>)
RTRWP/K	Provincial / Regency Spatial Plan (<i>Rencana Tata Ruang Propinsi / Kabupaten</i>)
RKU	General Business Plan
TTD	Threatened, Restricted Range, Protected Range and Trade Restricted Species (<i>Spesies yang Terancam, penyebarannya Terbatas, dan Dilindungi</i>)
VU	Vulnerable – (<i>Rentan</i>)

1 INTRODUCTION AND BACKGROUND

1.1 Introduction

PT Hutan Ketapang Industri (HKI), located in Ketapang District, Kalimantan Barat Province, is a subsidiary of Sampoerna Agro. The HKI concession area, which covers about 97,891 ha, has the potential to become the largest rubber plantation company in the world, and as such has strategic value for Sampoerna Agro. HKI's IUPKH-HTI concession license is in Ketapang District, Kalimantan Barat Province. Since 2012, HKI has developed an area of over 15,000 ha. At the end of 2015, Sampoerna Agro become a partner of New Forest Asset Management, Pty. Ltd (New Forest) in managing PT HKI. Sampoerna Agro, as the manager of HKI, has social and environmental responsibilities, commitments and policies to conduct sustainable forest management which can be recognized by stakeholders.

HKI is aiming to fulfil the principles of the Forest Stewardship Council (FSC) sustainable forest management certification, as well as meeting International Finance Corporation (IFC) Environmental and Social Performance Standards.

HKI requested PT Ata Marie and PT Ekologika Cosultants to conduct High Conservation Value assessment. The assessment was conducted in March – October 2017.

This document is a summary report of the full HCV report written in Bahasa Indonesia, submitted in January 2018. It contains all of the findings of the HCV assessment, but in addition contains a discussion and conclusion chapter that will be of use to management at HKI, Sampoerna Agro and New Forest Asset Management.

1.2 HCV Background and Approach

All natural habitats possess inherent conservation values, including the presence of rare or endemic species, provision of ecosystem services, sacred sites, or resources harvested by local residents.

HCVs are biological, ecological, social or cultural values which are considered outstandingly significant or critically important, at the national, regional or global level. There are six categories of HCVs.

The concept of HCV (High Conservation Value) emerged in 1999 as Principal 9 of the Forest Stewardship Council (FSC) standard for certified well-managed forest. The HCV concept was designed to help forest managers improve the social and environmental sustainability of wood production. Since then the HCV concept has been adopted by other forest certification standards and certification standards for agricultural production (e.g. RSPO standard).

The HCV Resource Network (HCVRN) was created in 2006 to promote the HCV approach as a resource management tool, achieve its consistent application, and bring stakeholders together (www.hcvnetwork.org). From 2006 to 2014, the HCVRN was governed by a Steering Group composed of environmental and social NGOs, private sector representatives, and multilateral organizations. In July 2015, HCV Network Ltd, a UK-registered non-profit company, was created to host the Network's Secretariat.

It is fundamental that HCV assessors share a common understanding of the HCV definitions, their interpretation in practice and the overall HCV approach. In order for HCV assessments to be consistent and comparable across commodities and regions, everyone needs to use the same HCV definitions. For the purposes of the HKI HCV Assessment, the FSC Principles & Criteria (P&C) v.5, 2012 have been used. Sub-categories have been adapted from the Indonesian Toolkit for HCV Identification (2008) by the HCVRN.

The HCV approach in its entirety is the process in which HCVs are identified, managed and monitored. Applying existing guidance for identification, management and monitoring of HCV

holistically should lead to a straightforward process as outlined in the following diagram from HCVRN Common Guidelines.

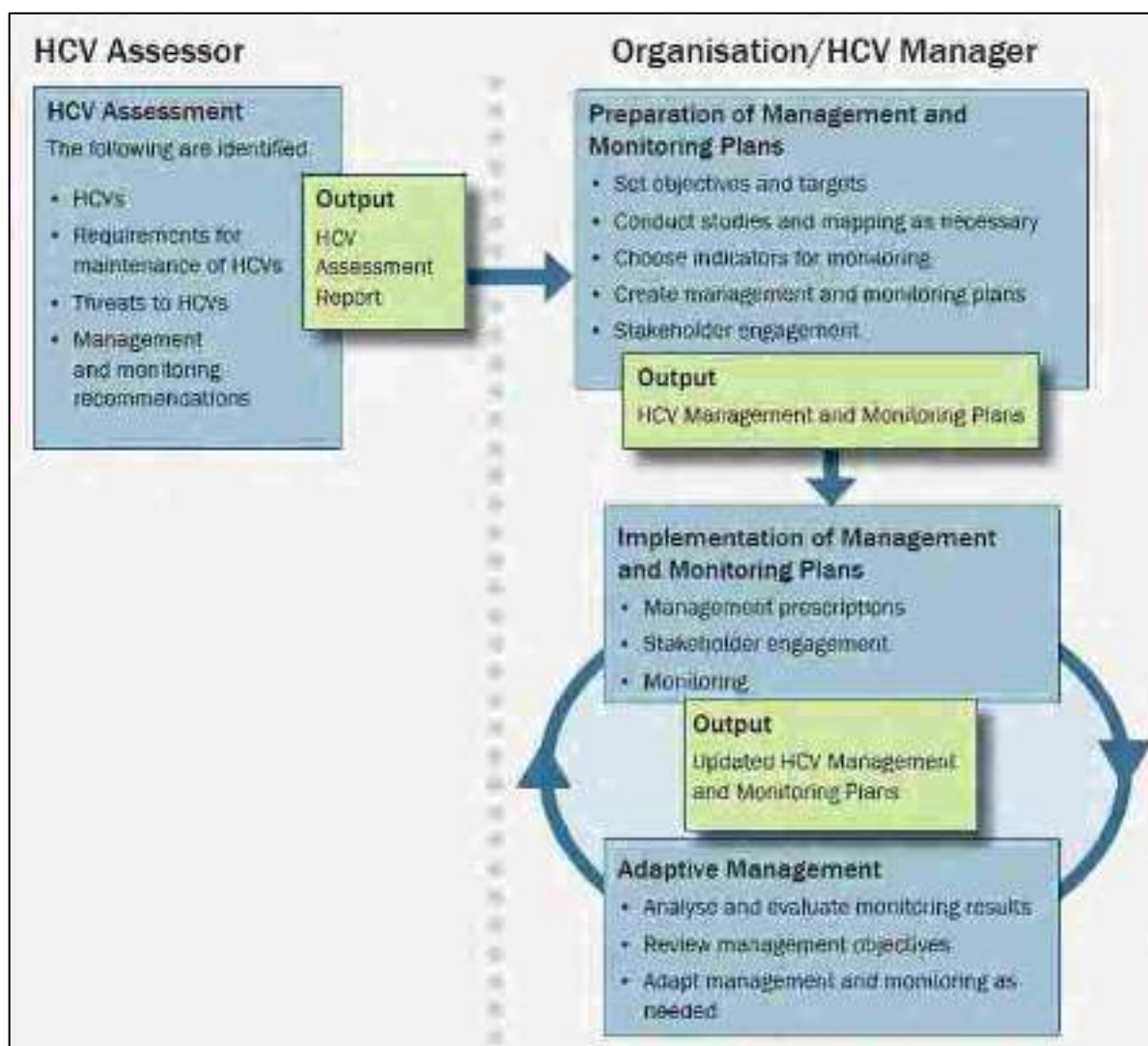
Commonly the full process is divided into three parts;

1. HCV Assessment
2. Preparation of Management and Monitoring Plans
3. Implementation of Management and Monitoring Plans under an Adaptive Management process.

An external team led by an experienced HCV assessor undertakes the HCV Assessment and prepares the Assessment Report for peer review (left hand side of the diagram). The Assessment Report includes recommendations for management and monitoring of HCVs, but does not include preparation of management and monitoring plans.

The scope of work proposed for the HKI HCV Assessment is designed to meet FSC Certification requirements. Report templates, as well as the peer review and QC processes follow FSC guidelines which differ slightly from HCVRN procedures.

Figure 1. HCV approach leading to maintenance and enhancement of high conservation values¹



¹ Brown, E. and M.J.M. Senior. 2014 (September). Common Guidance for the Management & Monitoring of High Conservation Values (HCVRN)

1.3 Background

HKI understands that the condition, paradigm and system of forest management is not the same as in the past. Therefore, HKI intends to implement a Sustainable Forest Management system to ensure sustainability of production, ecology and social functions. The sustainability of the production function will ensure the sustainability of forest management activities and provide benefits to all parties concerned. The sustainability of the ecology function prevents the occurrence of the process of destruction or degradation of the quality of forest ecosystems. While the sustainability of social functions will ensure the continued and even increasing economic and social benefits of forest management for communities.

HKI operations are spread across 97,891 ha. Rubber plantation establishment has converted natural ecosystems in the past. Areas selected for rubber cultivation are cleared prior to planting. Good drainage and suitable soil is required for rubber. Mineral fertilizers are applied several times per year. Development of roads will open up access to forest areas that surround the plantation and indirectly threaten wildlife in these forests through allowing an increase in hunting. In addition, drains will significantly affect the hydrology of the areas.

HKI has already developed a Management Plan (RKU) that includes the spatial plan for the concession. This is a legal requirement before any plantation development. However, the RKU and HCV Assessments are not always well aligned - significant areas planned for conservation in the RKU are not considered important for conservation by the HCV assessment, and significant areas considered important based on the HCV assessment are not conserved under the RKU.

1.4 Objectives and Outputs

The objectives of the HCV assessment are as below:

1. Identify the existence of HCVs in the assessment area (concession area and its surrounding landscape), and to describe value condition, and potential threats.
2. Define the area that contains HCVs (HCVAs) to describe distribution, mobility, structure, composition and/or status of the values.
3. Provide recommendations for HCV management and monitoring, as well as set aside areas needed based on comprehensive knowledge of the area (focusing on HCV management efforts within area under direct influence of company).

Priority outputs of the HCV assessment are:

1. HCV Report that defines
2. HCVs, HCVAs and HCVMA
3. Internal and external threats to HCVs / HCVAs

Capacity Development of HKI staff to identify, manage and monitor HCVs in the concession was also a principle output of the HCV assessment process and training pre and post assessment was carried out by the assessment team.

1.5 Assessment Landscape

HKI is a national private company engaged in Industrial Plantation Forest (HTI). HKI holds an UPHHK-HTI licence covering an area of ± 97,891 ha as stated in Ministry of Forestry Decree No: SK.663 / Menhut-II / 2011. Administratively, the license is located in Ketapang District, West Kalimantan Province. Forest administration is now under the West Kalimantan Provincial Forestry Office since the enactment of Law No. 23, 2106.

Although the HCV Assessment is primarily focused on the HKI concession area, the assessment uses landscape approach principles, where values must be evaluated in landscape context. Two landscapes have been identified for assessment by analysing biophysical aspects including river catchments and forest cover that extended beyond the concession area. The two landscapes are referred to as the Kendawangan and Air Hitam Landscapes.

Boundaries of the Kendawangan landscape can be described as follows (see Map 1):

- Eastern boundary: Kendawangan river, and the following oil palm plantation; PT Andes Agro Investama, PT Cahaya Nusa Gemilang, PT Karya Bhakti Agro Sejahtera.
- Northern Boundary: Watershed with PT Wanakerta Ekalestari Industrial Plantation Forest (HTI).
- Western and southern boundary: Watersheds with protected forest "Hutan Lindung Sungai Tengar" and within PT Putra Sari Lestari palm oil plantation.

Boundaries of the Air Hitam landscape can be described as follows (see Map 2):

- Northern and Eastern boundary: Keramat River and watersheds of the Air Hitam Besar River catchments.
- Western boundary: Air Hitam Kecil River.
- Southern boundary watershed within the PT Sukses Karya Sawit palm oil plantation.

For social aspects, the HCV assessment was conducted in 9 villages situated inside and around the concession area, especially those potentially affected by HKI operations and also potentially impacting on HCV management in the HKI concession area.

Villages (*Desa*) in the Kendawangan landscape include Banjarsari, Mekar Utama, Sungai Jelayan, Selimatan Jaya, Kedondong and Pangkalan Batu.

Villages in the Air Hitam landscape include Air Hitam Besar, Air Hitam Hulu and Air Tarap.

The HKI concession area is zoned as HP (Hutan Produksi) and HPT (Hutan Produksi Terbatas).

HKI concession area is adjacent to protected forest in both the Kendawangan and Air Hitam Landscapes. Protected areas include Sungai Tengar Protected Forest, Sungai Jelai Protected Forest and Muara Kendawangan Nature Preserve. Muara Kendawangan nature preserve and Sungai Tengar Protected forest are considered very important since it has endemic and threatened biodiversity, such as orangutan (*Pongo pygmaeus wurmbii*), pangolin (*Manis javanica*), Proboscis Monkey (*Nasalis larvatus*), Sambar Deer (*Rusa unicolor*), as well as more than 29 mammals, 20 birds, and 25 vegetation species that are endangered.

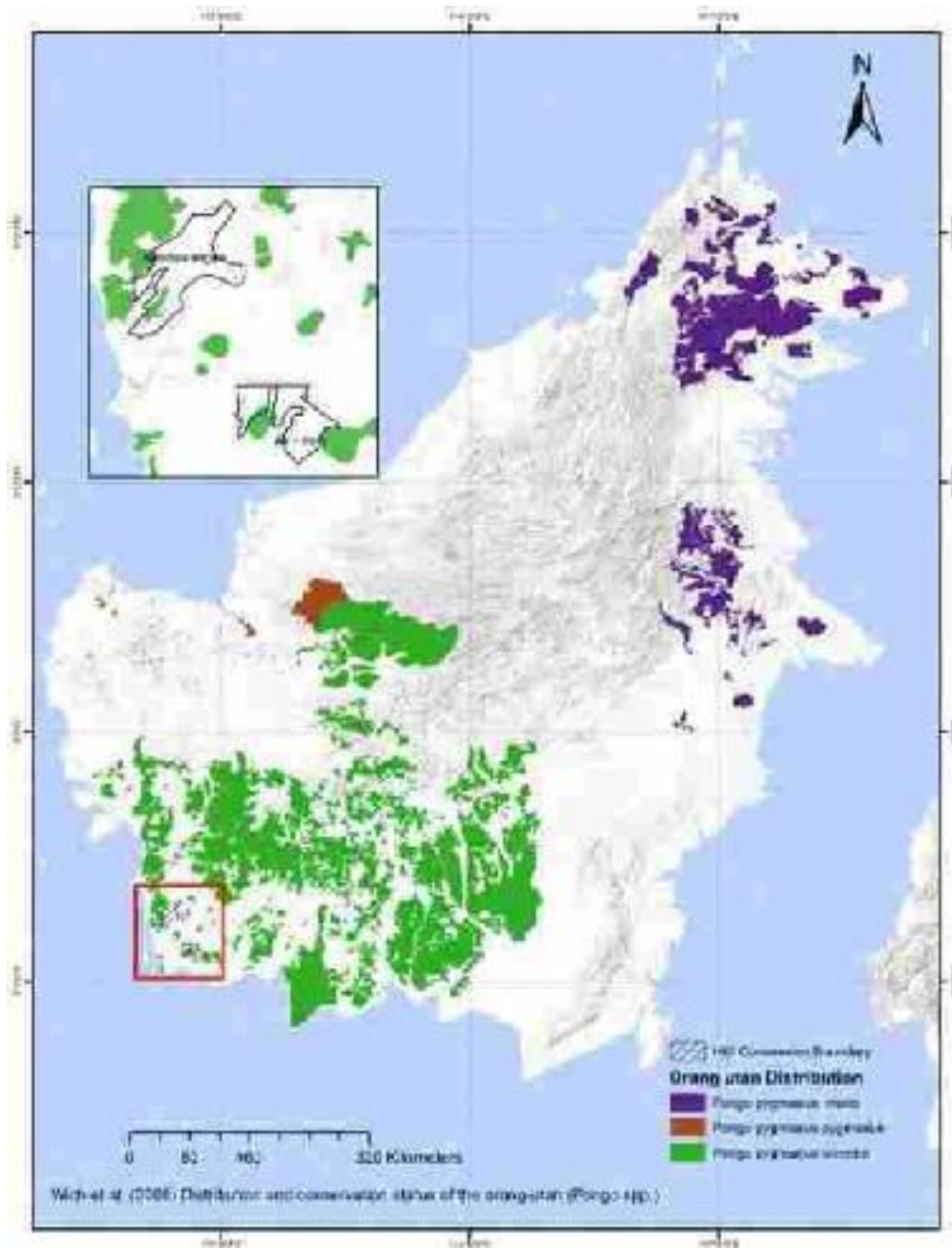
1.6 Orangutan

Kalimantan biogeographic units are characterized by a very high diversity of wildlife, so that forest as an animal habitat becomes very important. One of the important endemic animals of Borneo is the orangutan (*Pongo pygmaeus* spp) which includes 3 sub species on Borneo; *Pongo pygmaeus wurmbii*, *Pongo pygmaeus morio* and *Pongo pygmaeus pygmaeus*. Its declining population and habitat has caused IUCN to raise the status of Orangutan on it Red List from Endangered in 2008 to Critically Endangered (CR) in 2016.

The distribution of orangutan in Borneo is divided into three areas; *Pongo pygmaeus wurmbii* is distributed across West and Central Kalimantan, while *Pongo pygmaeus morio* is distributed across East and North Kalimantan and Sabah. *Pongo pygmaeus pygmaeus* has only small distribution in the north of West Kalimantan and Sarawak.

HKI landscapes are part of orangutan distribution area. HKI concessions can benefit conservation by creation of "corridors" or buffer zones in both the Kendawangan and Air Hitam landscapes.

Figure 2 Distribution of Orangutan (Wich et al, 2008²)

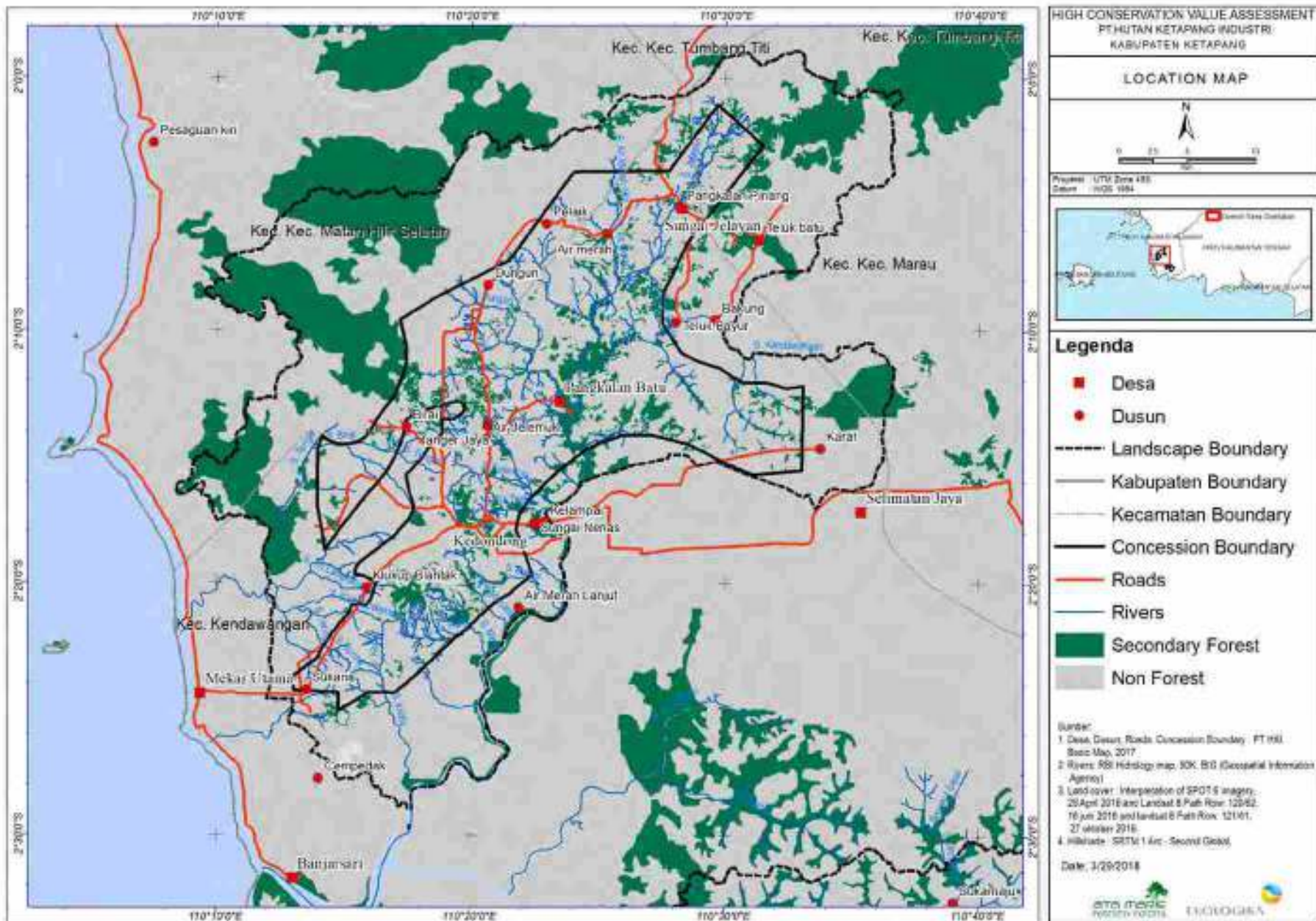


1.7 Peat Land Landscapes in and Around HKI

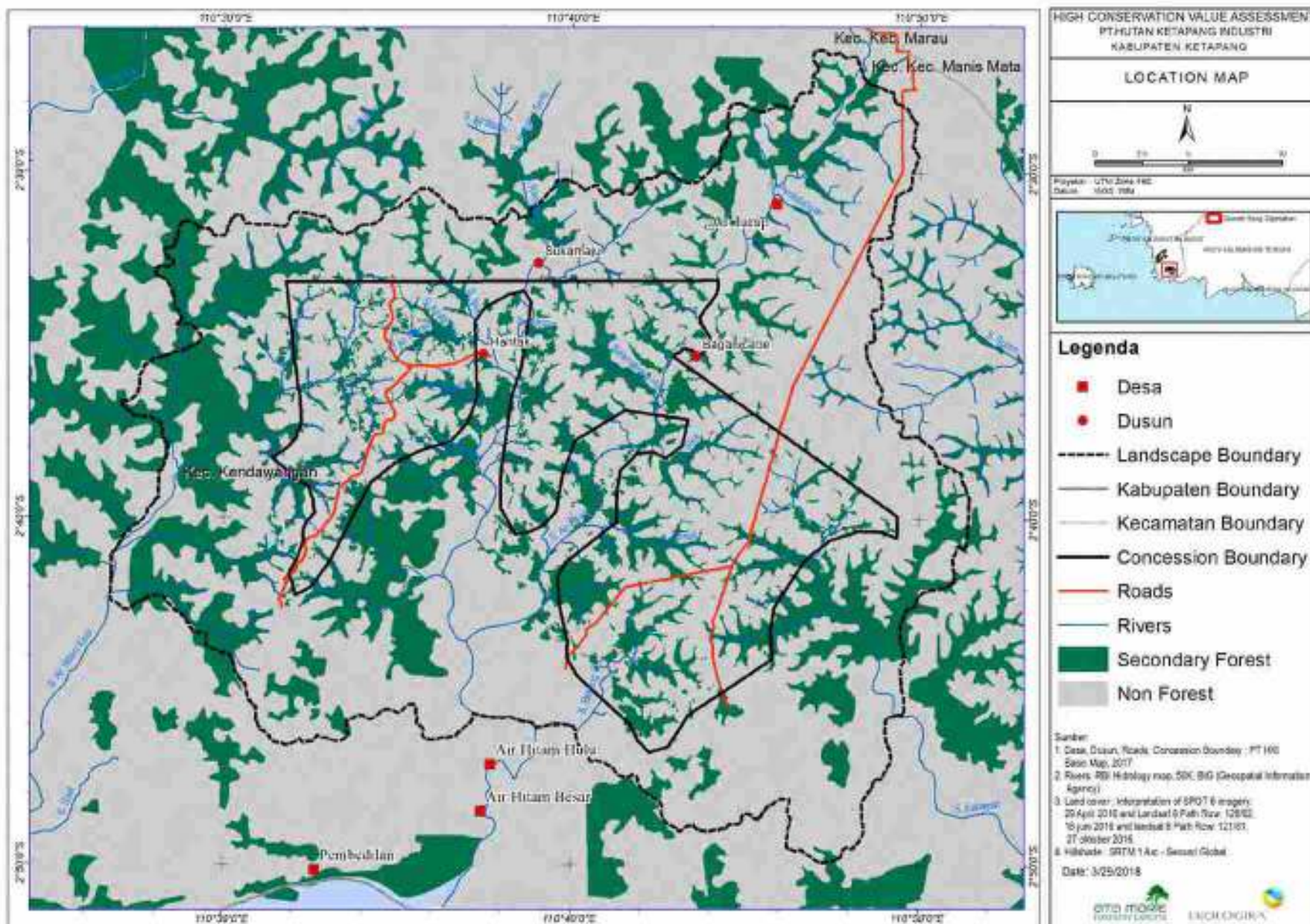
The distribution of peat swamp ecosystems within the HKI concessions is limited. The Ministry of Environment and Forestry has identified priority “Peat land Hydrological Units” (*Kesatuan Hidrologis Gambut*) that border and overlap the concession blocks. While the areas of overlap is small, these nationally important areas of peat within the broader landscape may be affected by management within the concessions and there maybe legal/land use implications that HKI should be aware of. See Map 3 - Peat Ecosystem Function Map and further discussion in Section 8.

² Wich et al (2008) Distribution and conservation status of the orang-utan (*Pongo* spp.) on Borneo and Sumatra: how many remain? *Oryx*, 42(3), 329–339 doi:10.1017/S003060530800197X, with 2013 updates by Wich, Singleton and Utami

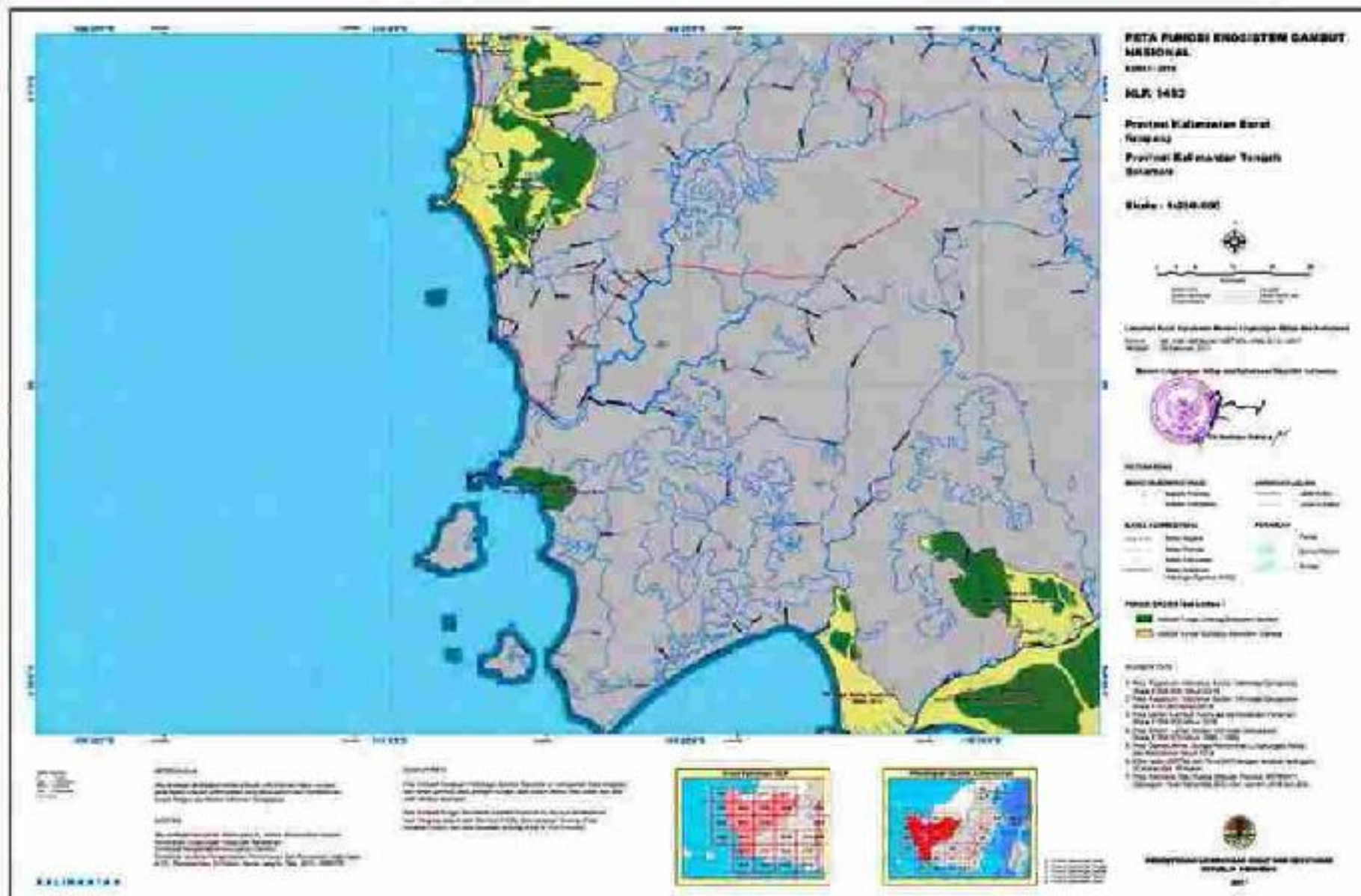
Map 1. Location Map and HCV Assessment Landscape of HKI – Kendawangan Landscape



Map 2. Location Map and HCV Assessment Landscape of HKI – Air Hitam Landscape



Map 3. Peat Ecosystem Function Map



2 HCV ASSESSMENT TEAM

HCV Assessment at HKI was conducted by PT Ekologika and PT Ata Marie. Summary information of team members are presented below.

Table 1. Assessor Team

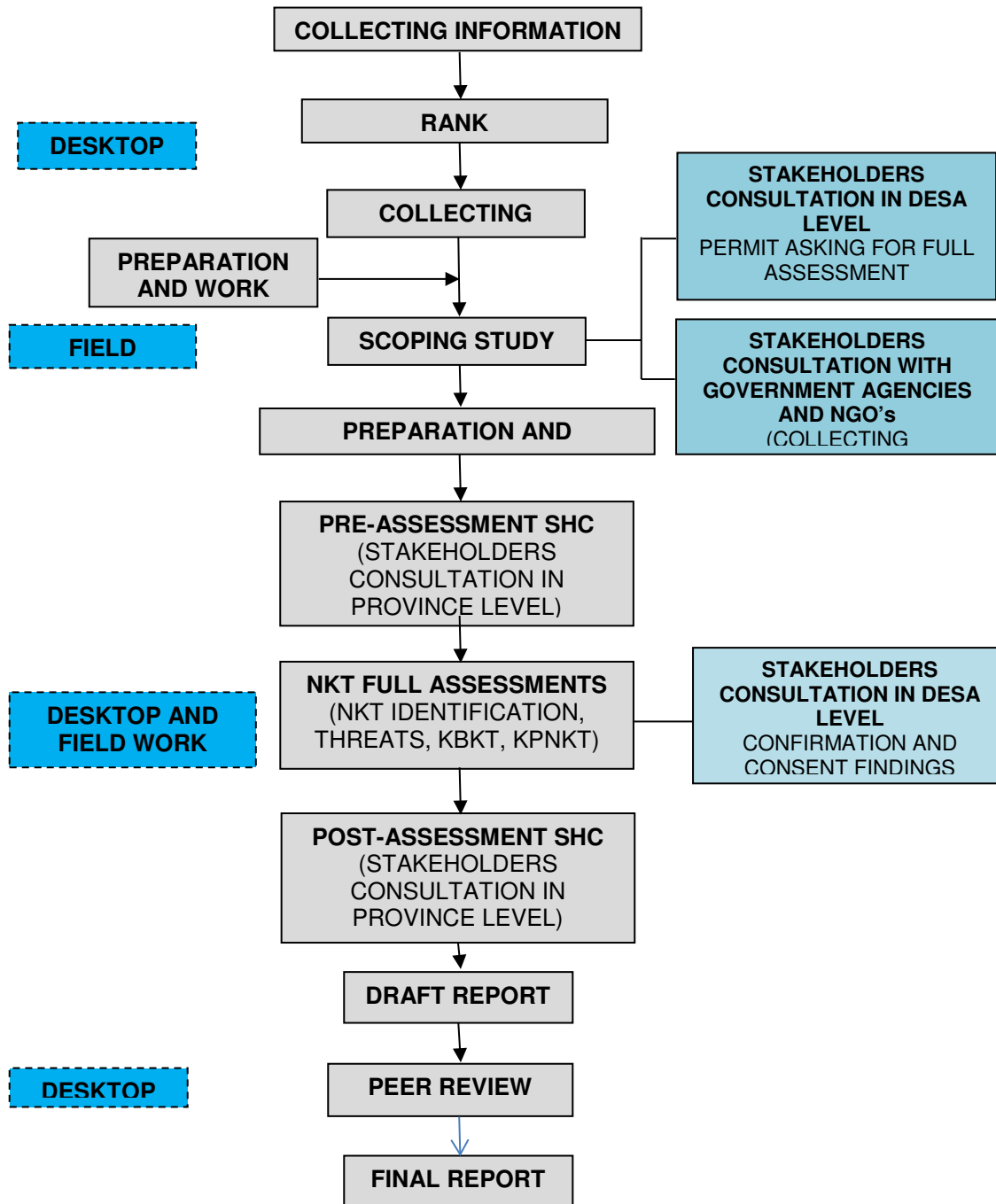
Name	Role	Expertise
<i>Field Survey</i>		
<i>Ninil Jannah</i>	<i>Assessment Team Leader, Social Advisor, Training specialist</i>	<i>EIA, SIA, landscape-livescape analysis, FPIC, participatory survey method, stakeholder engagement, ecosystem service, disaster risk management, HCV/HCS/FPIC trainer</i>
<i>Diah Wening Sariratri</i>	<i>Ecosystem Service Analysis</i>	<i>Environmental and ecosystem services analyst</i>
<i>Tri Setyadi</i>	<i>Biophysical Survey Leader, Ornithologist</i>	<i>GIS, Forestry management, ecosystem service and biodiversity surveys, Environmental Impact Assessments, High Carbon Stock Assessment, sustainable landscape-based conservation</i>
<i>Tia Mulyasari</i>	<i>Biophysical Survey, Ecosystem Service Analysis</i>	<i>Forestry, forest product management, bioenergy, environmental baseline survey, HCS</i>
<i>Widhyanto Muttaqiem</i>	<i>Social Leader</i>	<i>Participatory survey methods, community engagement and development, community-based disaster risk management, environmental education</i>
<i>Pudji Santosa</i>	<i>Social Survey</i>	<i>Participatory survey methods, community engagement and development, participatory mapping, environmental education</i>
<i>Sigit Purwanto</i>	<i>Social Survey Leader</i>	<i>Participatory survey methods, community engagement and development, community-based disaster risk management</i>
<i>Okki Shahibussalam</i>	<i>Social Survey</i>	<i>Participatory survey methods, community engagement and development, environmental education, conservation</i>
<i>Sunaring Kurniandaru</i>	<i>Social Survey</i>	<i>Participatory survey methods, community engagement and development, environmental education</i>
<i>Yugyasmono</i>	<i>Social Survey</i>	<i>Participatory survey methods, community engagement and development, environmental education</i>
<i>Agusti Randi</i>	<i>Biophysical Survey, Vegetation Expert</i>	<i>Vegetation Research and Surveys, Ecosystem conservation</i>
<i>Didik Raharyono</i>	<i>Biophysical Survey, Mammals Expert</i>	<i>Mammal surveys and conservation management</i>
<i>Dadan Setiawan</i>	<i>Geographical Information System, GIS Analyst</i>	<i>GIS, HCS, conservation management</i>
<i>Sofyan Iskandar</i>	<i>Social Survey, Geographical Information System</i>	<i>Land Use and Land Cover Survey/Research</i>
<i>Additional Support</i>		
<i>Alex Thorp</i>	<i>Project Manager</i>	<i>Forest-ecology, sustainable landscape-based conservation, GIS</i>
<i>Neville Kemp</i>	<i>Biophysical and Conservation Advisor</i>	<i>Biodiversity survey, ornithologist, forest-ecology, sustainable landscape-based conservation, FPIC, participatory survey methods, community engagement and development. Been involved in HCV surveys since 2008.</i>

3 METHODOLOGY

3.1 Assessment Process

Figure 2 shows the assessment process followed.

Figure 3 HCV Assessment Process



Primary data was collected through field survey activities, which conducted to fulfil data gaps and verify secondary data obtained from various sources (demographic and area information from Statistic Bureau, Meteorological Station, Geology Office, HKI), as well as information obtained during the scoping study and pre-assessment stage.

In addition to the above generic HCV process, a peer review was carried out to ensure international standards of reporting.

3.2 Field Survey Method

3.2.1 Biophysical Survey (HCV 1, HCV 2, HCV 3 and HCV 4)

Surveys to identify and assess the existence of HCV 1 – 4 in the HKI area was conducted in representative ecosystems found in HKI. i.e. (1) mixed dipterocarp forest, (2) heath forests, (3) Peat swamp forest, (4) riparian forest and (5) open wetland. A rapid inventory of vegetation, mammals and birds was conducted in each ecosystem type for a total of 19 days survey time.

Biodiversity

1. Mammals – Data was collected using Visual Encounter Survey³ method combined with a modified one-kilometre long Line Transect. Observation time are 06.30-10.00, 16.00-18.00 and 19.00-22.00.
2. Birds – Data was collected using Line Transect method by Bibby et al. (2000), for 1 km.⁴ Observation is conducted two times a day during high activity between 05.30-09.00 and 15.30-17.30, and from 18.00-20.30 at night for nocturnal birds.
3. Vegetation – Rapid vegetation assessment was conducted using a cruising method, where assessor explore and collect samples from various locations that represent each ecosystem types or vegetation types in assessment area (Rugayah, 2004).⁵

Ecosystem Services

1. Land cover ground-check to ensure the accuracy of forest cover data and to verify the existence of stream and spring locations obtained through interview, which will be useful in determining important areas for ecosystem services.
2. Ground check to determine the conformity of slope condition with Universal Soil Loss equation (or erosion hazard level calculation) (Wischmeier and Smith, 1978)⁶.
3. Measuring water turbidity using secchi disk at several main rivers and tributaries.
4. Interview with local people to obtain information on lowest and highest water level.
5. Beside observations, HCV 1-4 data was also obtained through information gathering using techniques below:
6. Interview – Semi-structured interview with people encountered during observation to obtain information on the presence of wildlife and vegetation in assessment area. These people were selected based on assumption that since their activities are closely related to forest, wildlife and vegetation, they are more knowledgeable and more experienced.
7. Focus Group Discussion (FGD) – FGD with community members to obtain data and information on ecosystem services (HCV 4), wildlife and vegetation (HCV 1-3), and potential threat against HCV 1-4.

³ Heyer, W.R., Donnelly, M.A., McDiarmid, R.W., Hayek, L.-A.C., & M.S. Foster, (eds.) 1994.

⁴ Bibby, Colin. Martin Jones & Stuart Marsden. 2000. Expedition Field Techniques: Bird Surveys. Royal Geographical Society. London.

⁵ Rugayah. Elizabeth, A. Widjaja. Praptiwi. 2004. Pedoman Pengumpulan Data Keanekaragaman Flora. Pusat Penelitian Biologi – LIPI. Bogor.

⁶ Wischmeier, W.H., dan D.D Smith. 1978. Predicting rainfall erosion losses: guide to conservation planning. USDA, Agriculture Handbook 537. U.S. Government Printing Office, Whashington, DC.

3.2.2 Social Survey (HCV 5 and HCV 6)

Data was collected in each village using a combination of various tools/techniques, participatory survey approach and consultation with local communities to obtain demographic and socioeconomic information, and perception on locations/area and resources needed by the community (including traditional community).

Data collection techniques used included Key Informant Interview (a semi structured interview to village officials, religious leaders, traditional leaders) and Interviews (relaxed semi structured interview to resource users and owners), as well as FGD, participatory mapping and ground checking to identify important areas. At each village, at least 3 FGDs and 2 ground checks were conducted.

3.2.3 Geographical Information System

Secondary data used included river network data, vegetation/land cover data, ecosystem proxy map, hotspot map, geological map, soil map, road network map, SRTM Digital Elevation Model (DEM), SPOT 6, Landsat 8 satellite imagery and rainfall map. To determine landcover, interpretation of SPOT 6 and Landsat 8 satellite imagery was processed with supervised classification method – in accordance to landcover classification from BAPLAN/Ministry of Forestry. DEM Data from CGIAR-CSI ver.4.0 was analysed to produce slope and altitude class.

Primary data was collected to verify SRTM accuracy and to verify landcover analysis results in 8 assessment points. Other data collected included indication of HCV presence within assessment area. To verify the accuracy of topographical conditions described in DEM secondary data, general observations were carried out throughout the landscape.

Spatial analysis to create delineation of HCV 1-6 was accomplished through data analysis of ecosystem and biodiversity (HCV 1-3), ecosystem service (HCV 4), basic and cultural needs of local/traditional community (HCV 5-6).

3.3 Stakeholder Consultations and Peer Review

HCV assessments should consult with stakeholders in the area including those directly affected by the development as well as in the wider landscape, to obtain inputs and information about the existence of HCVs in the concession. This is especially important for HCV relating to basic needs of communities and cultural values. More details of stakeholder consultation can be found in section 5.8 and table 13.

The purpose of peer review is to provide additional quality control for the HCV assessment report, and specifically to determine whether adequate data and data collection methodologies have been used, whether the assessment team has the required expertise, and whether the assessment of HCV status is justifiable. The Peer Review was carried out by a skilled and experienced HCV assessor (Mr. Idung Risdiyanto) who cross-checked HCV findings, evaluate the accuracy of identified HCV areas, and HCV management and monitoring recommendations. The peer reviewer was supplied with the final draft HCV assessment report, all field assessment conducted by the HCV assessment team and additional supporting documents. Comment provided by the peer reviewer were incorporated into the final report submitted. The peer review has been provided a separate report.

3.4 Project Schedule

Table 2. Assessment Schedule

Activities	Dates
Desk Study	1 – 12 March 2017
Scoping survey and obtaining assessment approval from community	13-26 March 2017
HCV Assessment Technical Training	20-21 March 2017
Pre-Assessment Report	27 March– 10 April 2017
Stake Holder Consultation Pre-Assessment	11 April 2017
Social Field Survey	13 – 28 April 2017
Ecosystem services survey	13 – 28 April 2017
Biodiversity survey	13 April – 4 May 2017
Consultative FGD for village representative /FPIC	8-23 September 2017
Draft report preparation	24 Sept–20 Oct 2017
Stakeholder Consultation Post Assessment	30-31 Oct 2017
Peer Review	November 2017
Finalisation of Reports	December 2017

4 DESCRIPTION OF PHYSICAL AND SOCIAL LANDSCAPE

4.1 Geology, Soils, Topography and Hydrology

Geology of the Kendawangan landscape is dominated by the Mineral Swamps. The western and eastern side of the concession is the formation of ‘Kerabai’ Volcano Rock. On the north and south sides the Ketapang Complex is dominant, and on the northern part there is ‘Sukadana’ granite rock and the ‘Malihan Pinoh’ sedimentary rock. Mineral swamp sediments are the dominant rock material in the entire Air Hitam block landscape.

Soil types in the Kendawangan Block are Spodosol, Ultisol, Oxisol, Entisol, Histosol and Inceptisol. Air Hitam Block is dominated by Entisol soil, then Histosol is on the east side and Inceptisol type is on the western side.

Topography of HKI area has variation of slope and altitude of varied places. The height of HKI area is 2-100 m above sea level. The roughness at the site of the study has a slope of up to 40%, dominated by areas with flat slopes reaching 87.98% of the area. The entire HKI area of the Air Hitam Block has a 0-8% slope, no hilly area, and is an alluvial plain.

Hydrology of the Kendawangan estates is dominated by the Kendawangan River and tributaries flowing into it from the west and north. In areas of higher topography, typical watershed patterns exist. In low lying areas around the Jelayan and Kelampai River wide areas of riparian forest exist have formed along meandering rivers.

The Air Hitam block is dominated by the Air Hitam, Air Hitam Kecil and Keramat Rivers. All of these rivers are short in length and due to the low lying topography of the areas have numerous branching tributaries and riparian “finger-swamps”.

4.2 Peat Ecosystems

Deep peat that is characteristic of “peat domes” is only found within the Kendawangan block on the western boundary. This peat area is important as it supports significant biodiversity and regulates hydrology in the landscape west of the concession. In the Air Hitam block, peat and peat forest is found along the “finger-swamps” the branch into the concession. This peatland type rarely attains the depth seen in some peat domes in Kalimantan, but nevertheless do have important function of hydrological regulation, reducing the spread of fire and harbouring biodiversity.

For this HCV assessment a specific peat survey was not carried out. We have used information from direct field observations for the assessment of HCVs that consider peat (HCV 4.1 – Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities, and HCV 3 - Ecosystem and Habitat. Rare, threatened, or endangered ecosystems, habitats or refugia). Therefore although peatland was not surveyed directly, we consider that peat areas have been captured in the HCV area described.

Table 3, Figure 3 and Figure 4 show the Peat hydrological Units as defined by MOEF. We have not used MOEF data to map HCVs as these were produced at a national and regional scale. Some of the area under the Peat Hydrological Unit has been identified as HCV, but not all. More precise mapping and documentation is needed in both of Kendawangan and Air Hitam to reduce the potential accusations of developing on “peat” where there is none in actual fact.

Table 3. Peat Hydrological Unit areas within HKI concession

Name of Peat Hydrological Unit	Location	Code	Total Area (ha)
KHG Sungai Keramat-Sungai Jelai	Air Hitam	KHG.61.04.14	2,296
KHG Sungai Kepulu-Sungai Pesaguan	Kendawangan	KHG.61.04.09	290

Figure 4. Peat hydrological Unit as defined by MOEF within Kendawangan Estates.

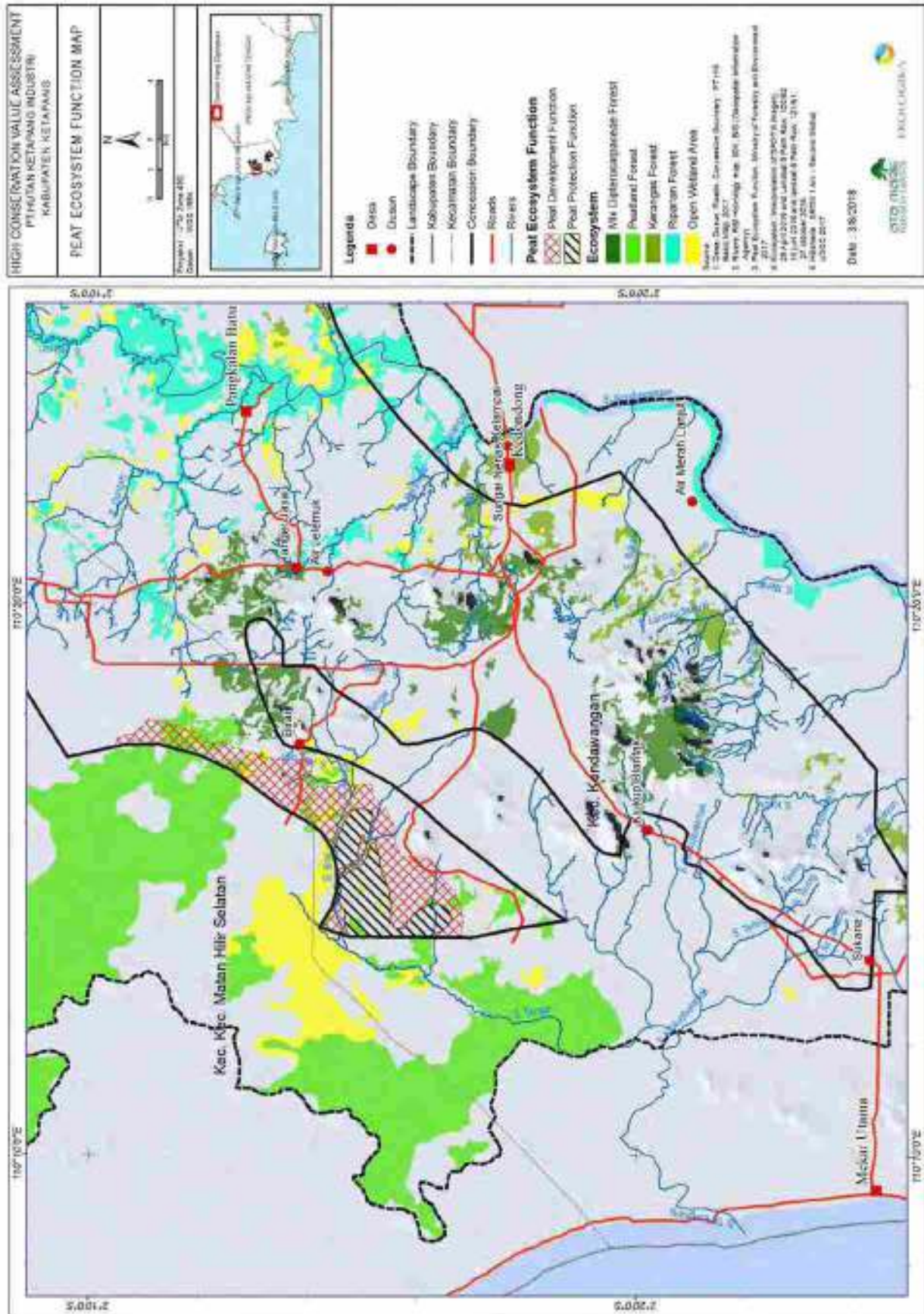
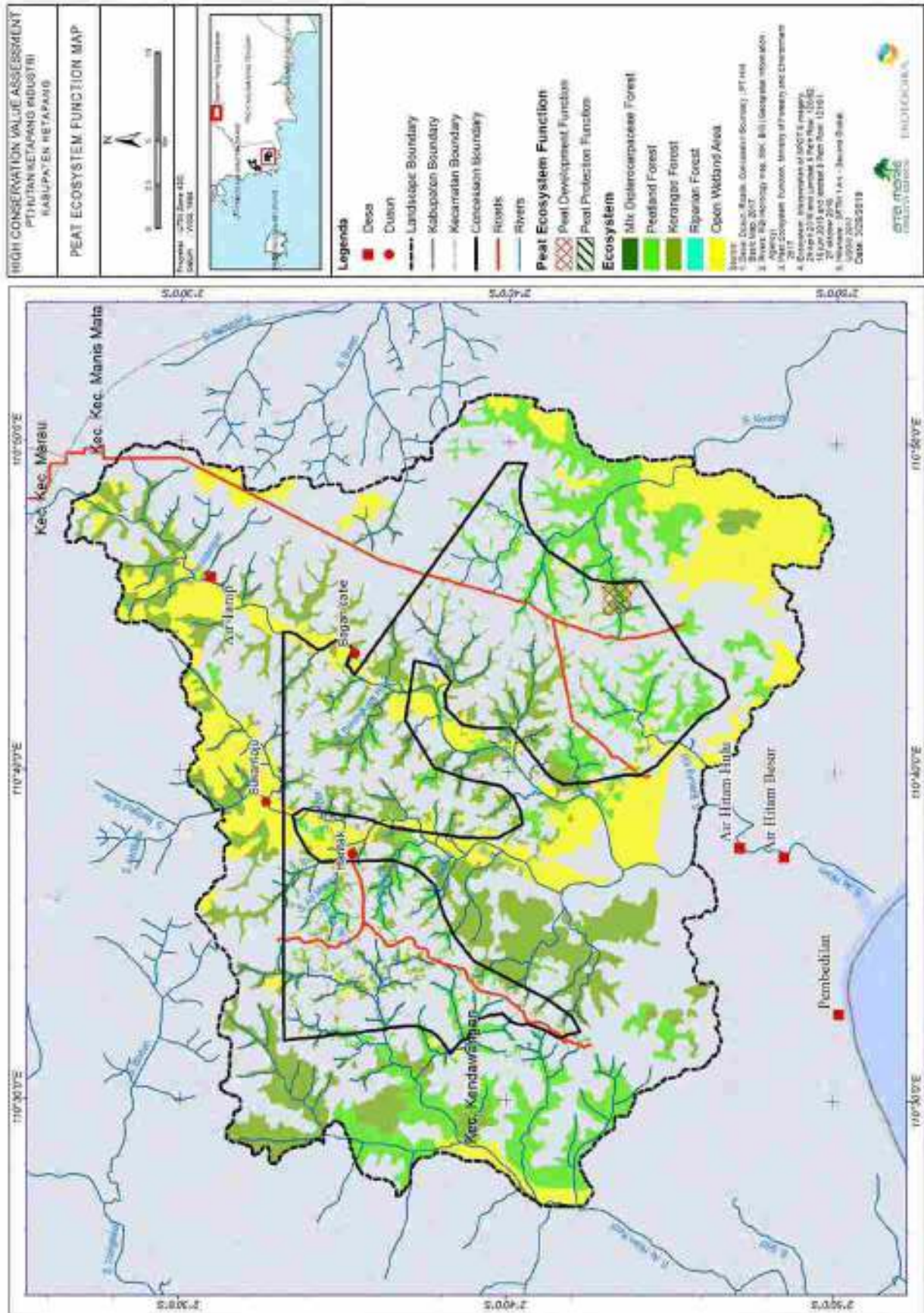


Figure 5. Peat hydrological Unit as defined by MOEF within Air Hitam Estates.



4.3 Land Cover and Natural Ecosystem Types

4.3.1 Land Cover

Table 4 shows the land cover across the HKI concession. Some key points:

- 19.2% of HKI remains forested (especially Air Hitam). This is a broad strata which includes a range of ecosystem types including Mixed Dipterocarp Forest, Peat Swamp Forest, 'Kerangas Heath Forest, Riparian Forest (described below). The forest condition is predominantly degraded secondary forest which has been impacted by selective logging and ground fires.
- 17 % of HKI consists of wetlands. 1.65% are natural ecosystems - undisturbed open water bodies and marshes, but the majority of w, regenerating scrub and gelam (*Melaleuca spp*) forest.
- 41% consists of degraded / non - natural vegetation on dry land. This ranges from open grassland, regenerating scrub, residual old *Acacia* plantations and gelam (*Melaleuca spp*).
- 20% of HKI has been developed, primarily for rubber plantations and related infrastructure.
- 3% of HKI has been developed by 3rd parties.

Table 4. Land Cover in PT HKI Area

Development Status	Category	Land Cover	Kendawangan	Air Hitam	Total	%
Undeveloped Areas	Natural Forest (Mixed Dipterocarp Forest, Peat Swamp Forest, 'Kerangas Heath Forest, Riparian Forest)	Secondary Forest	8,478	10,313	18,791	19.20%
	Undisturbed Wetland	Badan Air	161	26	187	1.65%
		Lahan Terbuka Basah	878	553	1,432	
	Disturbed Wetlands	Semak Basah	2,439	1,148	3,586	15.06%
		Belukar Basah	2,234	3,343	5,577	
	Disturbed dryland	Hutan Gelam Basah	5,507	75	5,583	40.90%
		Lahan Terbuka Kering	9,862	2,076	11,938	
		Semak Kering	4,844	17,559	22,403	
		Belukar Kering	2,318	517	2,835	
		Hutan Gelam Kering	1,042	213	1,255	
	Hutan Akasia	1,603	0	1,603		
Developed Area (plantations and infrastructure)			18,370	1,202	19,572	20.15%
Other Roads			119	31	149	
Areas Developed by Third Parties		Ladang	441	68	509	3.04%
		Sawit Masyarakat	1,583	0	1,583	
		Pemukiman	149	0	149	
		Perkebunan Kelapa Sawit	335	0	335	
		Pertambangan	192	212	404	
Total			60,554	37,337	97,891	100%

4.3.2 Natural Ecosystems Extant in the HKI concession

Direct observation in the two landscapes led to identification of the following natural ecosystem types: (1) Mixed Dipterocarp Lowland Forest, (2) Peat swamp forest, (3) Heath Forest, (4) Riparian forest, and (5) Open Wetland. These natural ecosystems are nested in the land cover described above.

Mixed Dipterocarp Lowland Forest – this ecosystem identified in dryland, the ground is not waterlogged and dry, mostly found in undulating area. Dominated by Burseraceae, Meliaceae, Myrtaceae dan Calophyllaceae such as Meranti (*Shorea leprosula*, *S.parvifolia* and *S.ovalis*), Resak (*Vatica oblongifolia* dan *Cotylelobium melanoxyton*) and Merawan (*Hopea dryobalanoides*). This ecosystem is only identified in the Kendawangan landscape.

Peat swamp forest - the distribution of peat swamp ecosystems in HKI is very limited and not in wide formation. This ecosystem identified located in narrow and elongated basin following river and stream patterns and surrounded bushland. In open area dominated by Perepat (*Combretocarpus rotundatus*) forming almost homogeneous formations such as those found in estate 4, in secondary peat swamp forest found in estate 5 dominated by Punak (*Tetramerista glabra*), Meranti buaya (*Shorea uliginosa*) and Kempas (*Koompassia malaccensis*).

Kerangas Heath Forest – secondary forest dominated by Pelawan (*Tristaniopsis obovata*), Balangiran (*Shorea balangeran*), Perepat (*Combretocarpus rotundatus*), Gerunggang (*Cratoxylum glaucum*) and some *Syzygium* spp. While in open areas dominated by the type of *Baeckea frutescens* that form a homogeneous quite wide formation.

Riparian forest – riparian forest cover dominated by *Syzygium* spp., Bintangur (*Calophyllum pisiferum*), Simpur (*Dillenia suffruticosa*), Rengas (*Gluta renghas*) and Resak (*Vatica umbonata*). After riparian forest found *Melaleuca cajuputi* spp. *Cumingiana* that grow after a fire.

Open Wetland - these ecosystems regularly occur a large flood resembling a lake especially when the rainy season. dried up when drought season, show little streams and grasslands during long drought seasons. Rasau (*Pandanus*) formation covering almost along of the water bodies and turning into forests with mixed vegetation.

4.4 Local Demography and Socio-economy

Based on the projection of Ketapang BPS (demographic and area information from Statistic Bureau) in 2014, the population of Kendawangan sub-district is 34,786 people, consisting of 18,120 men and 16,666 women of 19 different villages. Traditional communities of Kendawangan are very dependent on natural resources, especially river, swamp and forest. Their settlements are commonly found on riverbanks.

Indigenous people of the Kendawangan landscape are predominantly from the Dayak Kendawangan tribe. At the end of the 1980s, after the natural timber business declined, some migrants from Java and Banjar settled. Mining of bauxite and quartz brought migrants from Java, Sulawesi and Sumatera. Oil palm plantations began operating in the early 1990s, bringing more migrants including from West Barat, Flores and Sumba. The Dayak people are mostly settled in the Marau area, then moved to Pangkalan Batu, Kelampai, Sei Jelayan, Kedondong, and Klukup Blantak, Selinsing, Sukaria and Air Merah Lanjut.

In the Air Hitam landscape, Malay tribes from Banjarmasin have been living for 5 generations. At the time Malay tribes came, the Dayak tribe moved to Bagan Cabe sub-village, Air Hitam Besar village dan Air Tarap village.

Most houses in the landscape are constructed from timber with zinc sheets as roofs. In addition to utilizing timber for housing, people still use wood for work tools and home furnishings. In addition to timber communities also use non-timber forest products for work tools such as rattan and bamboo.

5 HCV IDENTIFICATION RESULTS

HCV approach divides HCV into six categories: (1) HCV 1 – Concentrations of species diversity, (2) HCV 2 – Landscape-level ecosystems and mosaics, (3) HCV 3 – Rare, threatened, or endangered ecosystems, habitats or refugia, (4) HCV 4 – Ecosystem services in critical situations, (5) HCV 5 – Community needs, and (6) HCV 6 – Cultural values.

HCVRN provides general guideline in interpreting definitions and to identify HCV. Although HCV Identification Guidelines for Indonesia (2009) was published before the latest adjustments of HCV definitions (2012), this guideline is still the best practical guidelines for Indonesia. HCV identification in this assessment follows standard agreement on sub-categories, criteria and procedures on HCV existence confirmation and distribution, as explained in HCV Identification Guidelines for Indonesia 2009.

5.1 HCV Identification Summary

Table 5 summarises HCVs identification results. Detailed findings are set out Sections 5-2 – 5.7.

Table 5. Summary of HCV Identification for PT HKI, based on HCVRN Guidance⁷, and Sub-category definitions for Indonesia as stated at *Pedoman Penilaian NKT di Indonesia*⁸

HCV Definition	HCV No	Description of Sub-Category	HCV Identification Result
<i>HCV 1 – Species Diversity</i> Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.	1.1	Areas that Contain or Provide Biodiversity Support Function to Protected or Conservation Areas	Present in Kendawangan Landscape – western area of PT HKI, estate 7, is directly adjacent to protected foresr Sungai Tengar, capable to support Orang utan (<i>Pongo pygmaeus ssp wurmbii</i>) in the area. Present in Air Hitam Landscape - Western area of HKI adjacent to Nature Preseve Muara Kendawangan and eastern area adjacent to protected peat swamp forest Sungai Jelai, capable to support Orang utan (<i>Pongo pygmaeus ssp wurmbii</i>) in the area.
	1.2	Critically Endangered Species	Present in Kendawangan: Orangutan (<i>Pongo pygmaeus ssp wurmbii</i>), Trenggiling (<i>Manis javanica</i>), Belangiran (<i>Shorea balangeran</i>), Meranti (<i>Shorea smithiana</i>). Meranti (<i>Shorea pallidifolia</i>). Present in Air Hitam : Orangutan (<i>Pongo pygmaeus ssp wurmbii</i>), Trenggiling (<i>Manis javanica</i>), Belangiran (<i>Shorea balangeran</i>), Meranti paya (<i>Shorea platycarpa</i>)
	1.3	Viable Populations of Endangered, Restricted Range or Protected Species	Present at Kendawangan– 25 Vegetation types, 29 Mammals and 20 Avifauna. Present at Blok Air Hitam : 16 avifauna, 25 mammalia, 11 flora.
	1.4	Habitat of Temporary Use by Species or Congregations of Species	Not Present – Temporary habitat is not found
<i>HCV 2 – landscape-level ecosystems and ecosystem mosaics, Undisturbed Forest Landscape.</i>	2.1	Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics	Not Present – No core areas with more than 20,000 ha within assessment area.

⁷ Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.). 2013 (October). Common guidance for the identification of High Conservation Values. HCV Resource Network.

⁸ Konsorsium Revisi HCV Toolkit Indonesia. 2009. Panduan Identifikasi Kawasan Bernilai Konservasi Tinggi di Indonesia. Tropenbos International Indonesia Programme, Bogor.

HCV Definition	HCV No	Description of Sub-Category	HCV Identification Result
Large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.	2.2	Areas that Contain Two or More Contiguous Ecosystems	Not Present – No ecotone and ecocline
	2.3	Areas that Contain Representative Populations of Most Naturally Occurring Species	Not Present – No Representation of natural species
HCV 3 – Ecosystem and Habitat. Rare, threatened, or endangered ecosystems, habitats or refugia.			Present in Kendawangan. Threatened: heath forest, peat swamp forest, riparian forest, open wetland, mixed dipterocarp lowland forest. Rare: Open wetland Present in Air Hitam. Threatened: heath forest, peat swamp forest, riparian forest, open wetland. Rare: Open wetland
HCV 4 – Ecosystem Services Basic ecosystem services in critical situations including protection of water catchments and control of erosion of vulnerable soils and slopes.	4.1	Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	Present – All water bodies and their banks, and all ecosystem both of Kendawangan and Air Hitam landscape
	4.2	Areas Important for the Prevention of Erosion and Sedimentation	Present only in Kendawangan Hilly area with TBE value > 180 /ha/year
	4.3	Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Present – All forest both of Kendawangan and Air Hitam
HCV 5 – Community Needs Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.	5		Present in Kendawangan– fish, direct income, building material, water for drinking and cooking, water for sanitation, work tools, medicine, Present in Air Hitam – rice, fish, work tools, building material, water for drinking and cooking, water for sanitation, direct income, medicine
HCV 6 – Cultural Values Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.	6		Present in Kendawangan and Air Hitam <ul style="list-style-type: none"> – Sacred sites. – Important sites for local culture – Species with cultural importance – Batu Peniatan – Local knowledge

5.2 Explanation of HCV 1 Identification – Species Diversity

HCV 1 is concerned with concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels Sub HCV 1.1 – Present	
Definition	Criteria
Areas that Contain or Provide Biodiversity Support Function to Protection or Conservation Areas	<ul style="list-style-type: none"> – Conservation areas near or inside concession area (with significant biodiversity) – Area that might provide biodiversity support function to protected or conservation areas near concession area – Area where operational activities might negatively affected biodiversity conservation function of a protected or conservation area.

Kendawangan landscape. Western area of HKI adjacent to Sungai Tengar protected area. Sungai Tengar protected forest is a habitat for Orangutan (*Pongo pygmaeus ssp wurmbii*). The remaining forest area of HKI where it is connected to the protected area is capable to support Orangutan existence. In the area, some species classified as RTE are identified. Therefore, the area not only support biodiversity inside concession area, but also support biodiversity in conservation/protected area. This area identified as HCV area, where the buffer 500m from protected forest is HCV management area.

Air Hitam Landscape. Some species classified as RTE are identified in western area of HKI adjacent with Muara Kendawangan nature preserve and the south eastern area of HKI adjacent with Sungai Jelai protected area. Air Hitam landscape has a meadow and forest cover. The remaining forest area is very important for Orangutan. Both protected areas are Orangutan habitat. Therefore, the area not only support biodiversity inside concession area, but also support biodiversity in conservation/protected area. Remaining forest area of HKI where connecting to Sungai Jelai protected area and Muara Kendawangan nature preserve capable to support the existence of Orangutan. This is a HCV area, and buffer 500m from those protected area is a HCV management area.

Sub HCV 1.2 – Present	
Definition	Criteria
<i>Critically endangered species</i>	<i>Critically endangered species (or sub-species) based on IUCN Red List</i>

Orangutan in Kendawangan landscape. based on information from the community, *Orangutan (Pongo pygmaeus ssp. Wurmbii)*, can still be found in the riparian forest of the Kendawangan River. Based on the precautional approach, these areas are considered HCV 1.2.

Orangutan in Air hitam landscape. *Orangutan* have been observed by Ekologika staff during previous visits to the area. Existence has also been confirmed by communities. These areas are considered HCV 1.2.

Trenggiling (*Manis javanica*), these animals have a wide range of habitats from primary forests to areas close to settlements, but good forests will be suitable habitats for their livelihoods. Belangiran (*Shorea balangeran*) is abundant in heath forest and peat swamp forest especially in estate 11. Meranti paya (*Shorea platycarpa*) can be found only in peat swamp forest. It is listed in the IUCN red list as CR.

Shorea smithiana is a Borneo endemic species only found in Kediuk Hill at an altitude of 150-400 m above sea level. Based on land cover and habitat preference, this species is predicted to present within PT HKI area. Data on distribution and population of this species is very limited and dated. The species is classified as CR (Critically Endangered) on IUCN Red List. Therefore, due to precautionary principles, HCV 1.2 is considered potentially present until further supporting data is obtained. All remaining forest area in landscape is a HCV area, and all remaining forest area of HKI is a HCV management area.

Sub HCV 1.3 – Present	
Definition	Criteria
<i>Viable Populations of Endangered, Restricted Range or Protected Species</i>	<ul style="list-style-type: none"> - All CR, EN, VU species as listed on IUCN Red List - Restricted range species occurred in one island or part of it - Species protected by Indonesia Law - Species listed on CITES Appendix I and II

Within landscape assessment:

Present at Kendawangan– 20 Avifauna, 29 Mammals and 25 flora.

Present at Blok Air Hitam: 16 avifauna, 25 mammals and 11 flora.

Vegetation. Within landscape assessment, 25 vegetation species in Kendawangan landscape and 11 vegetation species in Air Hitam landscape classified as Endangered and Vulnerable according to IUCN Red List are found and identified as HCV 1.3.

Table 6. List of HCV 1.3 Vegetation Species recorded in and around PT HKI

No.	Nama Species	Status				Location
		IUCN	CITES	PP No 7	Endemic	
1	<i>Aporosa lucida</i> (Miq.) Airy Shaw				E	3
2	<i>Aquilaria malaccensis</i> Lam.	VU	II			3
3	<i>Combretocarpus rotundatus</i> (Miq.) Danser	VU				1,2,5
4	<i>Cotylelobium melanoxyton</i> (Hook.f.) Pierre	EN				3,5
5	<i>Durio lanceolatus</i> Mast.				E	3
6	<i>Dyera polyphylla</i> (Miq.) Steenis	VU				5
7	<i>Endiandra elongata</i> Arifiani				E	5
8	<i>Glochidion kerangae</i> Airy Shaw				E	3,5
9	<i>Gymnostoma nobile</i> (Whitmore) L.A.S.Johnson				E	3,5
10	<i>Lithocarpus pusillus</i> Soepadmo				E	5
11	<i>Memecylon scolopacinum</i> Ridl.				E	3
12	<i>Palaquium cochleariifolium</i> P.Royen				E	5
13	<i>Polyalthia flagellaris</i> (Becc.) Airy Shaw				E	3
14	<i>Pternandra cogniauxii</i> M.P.Nayar				E	3
15	<i>Shorea balangeran</i> Burck	CR				5
16	<i>Shorea leprosula</i> Miq.	EN				3
17	<i>Shorea pallidifolia</i> P.S.Ashton	CR			E	5
18	<i>Shorea parvistipulata</i> F.Heim.				E	3
19	<i>Shorea smithiana</i> Symington	CR			E	3
20	<i>Shorea uliginosa</i> Foxw.	VU				5
21	<i>Sindora beccariana</i> de Wit				E	3
22	<i>Syzygium elliptilimum</i> (Merr.) Merr. & L.M.Perry				E	5
23	<i>Vatica oblongifolia</i> Hook.f.				E	3
24	<i>Vatica pauciflora</i> Blume	EN				3
25	<i>Xanthophyllum rufum</i> A.W.Benn.				E	3

Notes:

CR : Critical Endangered

EN : Endangered

VU : Vulnerable

App. I : species whose utilization is subject to strict regulations, so as not to jeopardize their survival

App. II : species that has not been threatened but will be threatened with extinction if excessively exploited

V : Undang-Undang Nomor 5 Tahun 1990 Tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya; Peraturan Pemerintah Nomor 7 Tahun 1999 Tentang Pengawetan Jenis Tumbuhan dan Satwa

End : Endemic

Mammals: Within the landscape assessed, 29 mammal species in Kendawangan landscape and 25 mammal species in Air Hitam landscape are classified as Endangered and Vulnerable according to IUCN Red List are found and identified as HCV 1.3.

Table 7. List of HCV 1.3 Mammals Species recorded in and around PT HKI

No	Species		Status				Location	
	Scientific	Common Name	IUCN	CITE S	PP No 7	End	Kend	A.Htm
1	<i>Macaca fascicularis</i>	Long-tailed Macaque	LC	App.II			v	v
2	<i>Macaca nemestrina</i>	Pig-tailed Macaque	VU	App.II			v	v
3	<i>Nasalis larvatus</i>	Proboscis Monkey	EN	App.I	v	E	v	v
4	<i>Presbytis rubicunda</i>	Maroon Leaf Monkey	LC	App.II	v	E	v	v
5	<i>Trachypitecus cristatus</i>	Silvered Langur	NT	App.II	v		v	v
6	<i>Muntiacus atherodes</i>	Bornean Yellow Muntjac	NT		v		v	v
7	<i>Muntiacus muntjak</i>	Southern Red Muntjac	LC		v		v	v
8	<i>Rusa unicolor</i>	Sambar Deer	VU		v		v	v
9	<i>Galeopterus variegatus</i>	Sunda Flying Lemur	LC		v			v
10	<i>Prionailurus planiceps</i>	Flat-headed Cat	EN	App. I	v		v	
11	<i>Neofelis diardi</i>	Sunda Clouded Leopard	VU	App. I	v		v	v
12	<i>Prionailurus bengalensis</i>	Leopard cat	LC	App.II	v		v	v
13	<i>Hylobates albibarbis</i>	Bornean Agile Gibbon	EN	App.I	v	E	v	v
14	<i>Nycticebus menagensis</i>	Bornean Slow Loris	VU	App.I	v	E	v	v
15	<i>Manis javanica</i>	Pangoline	CR	App II	v		v	v
16	<i>Lutra sumatrana</i>	Hairy-nosed Otter	EN	App II	v		v	
17	<i>Lutrogale perspicillata</i>	Smooth Otter	VU	App II	v		v	v
18	<i>Mydaus javanensis</i>	Sunda Stink-badger	LC		v		v	
19	<i>Pongo pygmaeus wurmbii</i>	Bornean Orangutan	CR	App. I	v	E	v	v
20	<i>Petaurista sp</i>	Flying Squirrel			v		v	
21	<i>Ratufa affinis</i>	Pale Giant Squirrel	NT	App. II	v		v	v
22	<i>Rheithrosciurus macrotis</i>	Tufted Ground Squirrel	VU				v	
23	<i>Sus barbatus</i>	Bearded pig	VU				v	v
24	<i>Tarcius bancanus</i>	Western Tarsier	VU	App.II	v		v	v
25	<i>Tragulus kanchil</i>	Lesser Mouse-deer	LC		v		v	v
26	<i>Tragulus napu</i>	Greater Mouse-deer	LC		v		v	v
27	<i>Tupaia glis</i>	Common Treeshew	LC	App.II				v
28	<i>Tupaia tana speciosa</i>	Large Treeshrew	LC	App.II			v	v
29	<i>Helarctos malayanus</i>	Sun bear	VU	App.I	v		v	v
30	<i>Cynogale bennettii</i>	Otter-Civet	EN		v		v	v
31	<i>Hemigalus derbyanus</i>	Banded Palm Civet	NT	App. II			v	

Notes :

CR : Critical Endangered

EN : Endangered

VU : Vulnerable

LC : Less Concern

App. I : species whose utilization is subject to strict regulations, so as not to jeopardize their survival

App. II : species that has not been threatened but will be threatened with extinction if excessively exploited

V : Undang-Undang Nomor 5 Tahun 1990 Tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya; Peraturan Pemerintah Nomor 7 Tahun 1999 Tentang Pengawetan Jenis Tumbuhan dan Satwa

End : Endemic

Birds: Within the landscapes assessed, 20 bird species in Kendawangan landscape and 16 bird species in Air Hitam landscape are classified as Endangered and Vulnerable according to IUCN Red List are found and identified as HCV 1.3.

Table 8. List of HCV 1.3 Bird Species recorded in and around PT HKI

No.	Species		Status				Location	
	Scientific	Common Name	IUCN	CITE S	PP No 7	End	Kend	A. Htm
1	<i>Haliastur indus</i>	Brahmany Kite		II	v		v	v
2	<i>Ichthyophaga ichthyaetus</i>	Grey-headed Fish Eagle		II	v		v	
3	<i>Pernis ptilorhynchus</i>	Oriental Honey Buzzard		II	v		v	v
4	<i>Spilornis cheela</i>	Crested Serpent Eagle		II	v		v	
5	<i>Nisaetus chirhatus</i>	Changeable Hawkeagle		II	v		v	
6	<i>Elanus caeruleus</i>	Black - wing Kite		II	v		v	
7	<i>Pandion haliaetus</i>	Osprey		II	v		v	v
8	<i>Halcyon smyrnensis</i>	White-throated kingfisher			v		v	v
9	<i>Pelargopsis capensis</i>	Stork-billed kingfisher			v		v	v
10	<i>Ceyx rufidorsa</i>	Rufous-backed kingfisher			v		v	v
11	<i>Todirhampus chloris</i>	Collared kingfisher			v		v	v
12	<i>Alcedo meninting</i>	Blue-eared kingfisher			v		v	v
13	<i>Ciconia stormii</i>	Storm's – stork	END		v		v	
14	<i>Leptoptilos javanicus</i>	Lesser Adjutant	VU		v		v	v
15	<i>Lonchura fuscans</i>	Dusky munia				E	v	v
16	<i>Setornis criniger</i>	Hook-billed Bulbul	VU					v
17	<i>Ketupa ketupu</i>	Buffy Fish-Owl		II			v	v
18	<i>Anthracoceros albirostris</i>	Oriental Pied Hornbill		II	v		v	v
19	<i>Microhierax fringillarius</i>	Black-thighed Falconet		II	v		v	v
20	<i>Falco peregrinus</i>	Peregrine Falcon		I	v		v	v
21	<i>Melanoperdix nigra</i>	Black Partridge	VU				v	v

Notes :

VU : Vulnerable

App. I : species whose utilization is subject to strict regulations, so as not to jeopardize their survival

App. II : species that has not been threatened but will be threatened with extinction if excessively exploited

End : Endemic

V : Undang-Undang Nomor 5 Tahun 1990 Tentang Konservasi Sumber Daya Alam Hayati dan Ekosistemnya; Peraturan Pemerintah Nomor 7 Tahun 1999 Tentang Pengawetan Jenis Tumbuhan dan Satwa

An area in Kendawangan Block has been identified as an important corridor for the sunbear. This species has been seen in this area using *Acacia* plantation and other land use types. Management of this area need special attention even though it is not a natural ecosystem. It could be available for rubber development as long as small areas are opened at one time and connectivity between sunbear habitats (HCV Areas) is maintained.

Sub HCV 1.4 – Not Present	
Definition	Criteria
<i>Habitat of Temporary Use by Species or Congregations of Species</i>	Certain species that needs a specific habitat in their life cycle, where they congregate, stay, breed, migrate, etc is considered as keystone habitat

Species may stay in several habitats during different phase of its lifecycle. Their use might be seasonal or during stressful period, and important to the sustainability of overall population. Such habitat is called keystone habitat. No keystone habitat found in assessment landscape.

5.3 Explanation for HCV 2 Identification - Landscape-level ecosystems and ecosystem mosaics, Undisturbed Forest Landscape

Large landscape-level ecosystems and ecosystem mosaics, that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

HCV 2.1 – Not Present	
Definition	Criteria
<i>Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics</i>	<i>Core Area >20,000 ha consists of unfragmented natural habitat</i>

Based on ground check and GIS analysis, unfragmented landscape is not present, both in Kendawangan and Air Hitam landscape. SPOT 6 satellite imagery recorded on March-April 2016 and Landsat 8 imagery recorded on June and October 2016, shown that the remaining forest area is 13.494,35 Ha, not yet buffered into 3 km, made the core zone less than 20,000 ha.

HCV 2.2 – Not Present	
Definition	Criteria
<i>Areas that Contain Two or More Contiguous Ecosystems</i>	Area should have two or more continuous representative ecosystems within landscape – with ecotone/ecocline

Based on ecosystem mapping and ground check in both landscape, Kendawangan and Air Hitam, contiguous ecotones and ecoclines not present. Fire and conversion has caused fragmentation to natural ecosystem in the area.

HCV 2.3 – Not Present	
Definition	Criteria
<i>Areas that Contain Representative Populations of Most Naturally Occurring Species</i>	Extensive area with surrogate biodiversity/landscape necessary to support such species.

Other species considered as representative population of most naturally occurring species include the presence of all of the following: *Nycticebus menagensis* (Kukang), *Presbytis rubicunda* (Kelasi), *Trachypithecus cristatus* (Lutung), *Nasalis larvatus* (Bekantan), *Macaca fascicularis* (Monyet), *Macaca nemestrina* (Beruk) *Hylobates albibarbis* (Owa Kalawat), *Pongo pygmaeus wurmbii* (Orangutan), These species can represent/serve as proxy for landscapes that have a near natural condition. However, the landscape condition of the study is a fragmented forest mosaic by roads, settlements, mining areas or ex-mines and oil palm plantations. The species are trapped in forest fragments, not capable to support each other.

5.4 Explanation for HCV 3 Identification – Ecosystem and Habitat

HCV 3 – Present	
Definition	Criteria
Rare, threatened, or endangered ecosystems, habitats or refugia.	<p><i>Threatened</i></p> <ol style="list-style-type: none"> 1. Lost 50% or more of initial area of a biogeographical ecosystem unit. 2. Will lose 75% or more of the initial area, based on the assumption that all HPK/APL area will be converted. <p><i>Rare: natural ecosystem that covers less than 1-5% of biogeographical area.</i></p>

To determine rare and threatened status, the greater geographical unit of Kalimantan should be taken into account. First, if the current range of a regional proxy ecosystem has dwindled more than 50% of its historical distribution for Kalimantan or specific for concession area, such ecosystem is considered threatened. Moreover, if the current range of a regional ecosystem is less than 1% of the total range of all natural ecosystems in the area, the ecosystem is considered rare.

Based on the calculation of proxy ecosystem and ground check, a rare ecosystem is found in the area.

Present in Kendawangan. Threatened: heath forest, peat swamp forest, riparian forest, open wetland, mixed dipterocarp lowland forest. **Rare:** Open wetland.

Present in Air Hitam. Threatened: heath forest, peat swamp forest, riparian forest, open wetland. **Rare:** Open wetland. All ecosystem found in landscape and concession area.

5.5 Explanation for HCV 4 Identification – Ecosystem Services

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

HCV 4.1 – Present	
Definition	Criteria
Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	<ul style="list-style-type: none"> - Forest in watershed area is in good condition and able to function in regulating water in downstream area. - Forest in watershed is in good condition and able to function in regulating water in downstream area. If the area provides services to supply water or prevent flood. - Forest ecosystem, such as cloud forest, montane ridge forest, riparian ecosystem, karst forest, wetland ecosystem including peatland, grassland, have a significant hydrological function

Based on ground check, natural vegetation that can help control flood is still present in Kendawangan and Air Hitam landscape. River and all existing ecosystem is crucial in controlling flood and providing fresh water.

HCV 4.2 – Present	
Definition	Criteria
Areas Important for the Prevention of Erosion and Sedimentation	Forest area with steep slopes and Erosion Hazard Level (Tingkat Bahaya Erosi, TBE) >180 ton/ha/year, good forest cover to prevent erosion, landslide and sedimentation.

Based on field observation and GIS analysis, the potential erosion hazard ranges from low low in flat to rolling topography areas, up to very high (TBE>180 ton/ha/year) in hilly areas with slope gradient >40%. Hills within assessment area must be protected to prevent erosion due to high rainfall. Therefore, areas with TBE>180 ton/ha/year are considered important to control erosion and sedimentation. HCV 4.2 only identified in Kendawangan landscape.

HCV 4.3 – Present	
Definition	Criteria
<i>Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire</i>	<i>Natural forest with good condition is not prone to fire. For example, a peat forest with an intact hydrology system, swamp forest, wetlands, and other green lines consists of fireproof plants will be able to deter forest fire.</i>

Based on Interview, in 1997-1998, a huge fire hit in HKI area. On 2012 there was a fire at Muara Kendawangan Nature preserve. Greenpeace recorded a forest fire in Air Hitam Block on 2013, 2014, 2015. Mekar Utama Village suffered a fire in 2016.

Forest or wetland ecosystem can prevent the spread of forest fire. Therefore, such area/ecosystem has an important value as natural fire barrier. Forest, open wetland, river with riparian forest play a significant role as natural fire barriers.

5.6 Explanation for HCV 5 Identification – Community Needs

HCV 5 – Present	
Definition	Criteria
<i>Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), identified through engagement with these communities or indigenous peoples.</i>	– Sites or natural resources fundamental for satisfying substantial basic needs of local community, irreplaceable, and managed in traditional and/or sustainable manner by its user/owner/manager.

The attributes of HCV 5 are the primary natural resources or places/lands to meet basic needs and are useful as a source of livelihood. Resources / places managed or taken by citizens (their products) to meet their own needs (food, drink, clean water, firewood, etc.) or (these are for sale) to earn money to meet other basic needs (clothing, housing, transportation, education, health, etc.).

Smallholder rubber plantations are assessed to be HCV 5 as there are people who still maintain their rubber plantation as an inheritance and key source of livelihood.

Oil palm plantations are not assessed to be HCV 5 as these are regarded as a commercial activity rather than as fulfilling basic needs. In addition, growing palm oil on land zoned for forestry is illegal.

Table 9. HCV 5 Identification of Kendawangan Block

Basic Needs	Attribute	Level of interest	Availability and Affordability of Alternatives	Natural Resource Management / Utilization	HCV Yes/No
Rice fields	<i>Padi lokal, ketan merah, ketan putih</i>	<i>No more people who do farming activities to meet the needs of food and everything is obtained by buying</i>	<i>Meet the needs of rice by buying.</i>	<i>No more farming because of pests and the ban on land clearing by burning</i>	<i>No No one is planting local rice for food</i>
Fresh water fish	<i>Seluang, parau, toman, gabus, tapah, bantak, keparas, patung, kekapar, belida, siluk, biawan, kepuyuh, baung, junjung, palok, rampai</i>	<i>Fresh water fish has been a major source of protein for a long time., are mostly consumed by themselves. If they get excessive then some sold as additional income</i>	<i>Fish is easy to get, Another alternative to get meat protein is to buy from a merchant.</i>	<i>Residents fishing by using traps and trawls, fishing rods, seurak, nets, and gulps. They are fishing only for own consumption. If they get more fish, then it will be sold.</i>	<i>Yes Fishing by using traditional system, not using chemical poison</i>
	<i>Biyuku, Labi-labi dan penyu</i>	<i>Not a basic need for protein needs.</i>	<i>Available alternatives. Livestock product, buying meat from seller</i>	<i>Not specifically hunted. These animals are taken when accidentally encountered in the river</i>	<i>No Not HCV 5 because these species are a protected species and are not a primary requirement of protein fulfilment</i>
Meat	<i>Rusa, babi hutan, ayam hutan, kijang, pelanduk, trenggiling, monyet, kelasi, kera, beruk, klempiau, bentangan, ular sawa, biawak</i>	<i>Hunting wildlife to meet protein needs only additional, it's not a daily activity</i>	<i>Available alternatives. Livestock product, buying meat from seller</i>	<i>Hunting is done opportunistically : no limitation for size of the animals being hunted, no special time for hunting, and hunting locations depending on the season.</i>	<i>No This species is still in consumption if found but contrary to HCV 1 then it does not become HCV</i>
Vegetables	<i>Jengkol, umbut nangka, rebung, umbut jelayan, daun jengkol, daun bebarak, daun paku, untuk habis melahirkan; cempedak hutan, asam saung, asam kandis, kulat/jamur tiung</i>	<i>It's no longer dependent on certain types of vegetables from the forest,</i>	<i>Cultivation of vegetables in the yard of houses such as chili, cassava, cucumber. Buy vegetables from a seller.</i>	<i>harvesting those vegetables while going to the fields, river or forests.</i>	<i>No It's no longer dependent on certain types of vegetables from the forest, and many have cultivated them</i>
Fruits	<i>Durian, teratung, kapul, kekalik, sebangkui, betapik, rukam, kebauk, kalik babui, lembawang, pauh</i>	<i>It's no longer dependent on certain types of fruits from the forest,</i>	<i>Cultivation of fruit crops in the yard and fields of houses such as bananas, rambutan, limes, and mango acids. Buy fruit from a seller</i>	<i>Fruit crops are planted in former fields and not overthrown because of the land ownership markers.</i>	<i>No It's no longer dependent on certain types of fruits from the forest, and many have cultivated them</i>
Tools	<i>1. Tools and handicraft – Rattan</i>	<i>People still use and make their own tools to fishing (bubu, kecuk, penggak, etc.), farming / gardening, various baskets to bring stock or harvest (tengkalang, kindai) and others</i>	<i>A practical alternative is available, but people prefer to make their own tools and work tools because the raw materials are still available around the village, cheaper and more durable.</i>	<i>Harvesting the rattan material as needed and choose the appropriate size of the rattan, straight, good, and old.</i>	<i>Yes Harvesting the rattan material as needed</i>

Basic Needs	Attribute	Level of interest	Availability and Affordability of Alternatives	Natural Resource Management / Utilization	HCV Yes/No
	2. Tool and handicraft – Timber : Kayu medang, kayu pelaik, kayu leban, meranti	Timber as raw material used to make boat and oars for fishing	Timber materials are still needed to make a canoe, but the type is hard to find.	The type of wood to be used as boat material is chosen best by looking at the physical shape and size / dimensions required.	Yes Restriction of type and size of the wood
	3. Tools and handicraft – Leaves : Daun perupuk, pandan, purun, jakas, mengkuang	Many people still use to make mats for various purposes and various work tools.	but people prefer to make their own tools and work tools because the raw materials are still sought around the village, cheaper and more durable.	Harvesting raw material as needed from riparian around the settlement. Purun growth along the river	Yes
Building Materials: Timber	Belangiran, meranti, nyatoh, kerukup, kempas, pakit	Wood is still the main material in building a house. It is important for building materials such as home foundation and home frame.	Many home building components must use wood and no replacement. Currently wood can still be obtained but difficult and further to obtain it.	They cut of the by them self in forest or riparian or swamp. Trees that are harvested are over 25 cm in diameter to ensure the sustainability of the supply which is currently reduced considerably due to fires occurring each year.	Yes Restriction of type and size of the wood
Firewood	Kayu Leban, pansik, mensirak, mensirak, simpur, mentapai	People still use firewood as a fuel for cooking but not the main one.	LPG gas is now commonly used by the public and easily available in village stalls.	Fulfillment of firewood needs is available around the settlement. Communities take from trees that are in a state of decay or death	No Wood fuel is used as a reserve fuel source by most people. The main fuel used is LPG gas 3 kg size.
Medicine	Pucuk ketuat, pucuk sambung, pucuk kecaping, pasak bumi, akar kuning, brotowali, langir, daun sirsat, daun siri, akar tatak, gambir, pucuk guala, Daun Cucer, Daun Simpung for deer bait, Serai, Pahiyau (akar wangi), Pasak Bumi, Akar Tengkek Biawak, Akar Temiang, Akar Lalang.	There are still many people who use traditional medicine that come from nature/forest.	Using medicines purchased from local shops or they go to the nearest health centre	Citizens have knowledge about the plants to treat certain types of diseases. Some types of plants are taken as needed and some are collected for storage.	Yes
Clean water for drinking and cooking	Springs	Most people depend on spring water for drinking and cooking.	Water quality from springs is considered better than other water sources.	Residents keep their springs by planting various trees. Since hereditary, there is a prohibition to cut down trees that grow around the springs. The area around the spring is also prohibited for the activity of cultivation.	Yes
	River	Some villages depend on rivers for clean water for drinking and cooking	For some village, river is the only source for clean water. It is used throughout the year or they buy water refill.	Residents maintain the upstream area by planting life plants and woody trees. There is already a ban on the use of toxins and stuns in the process of catching fish in the	Yes

Basic Needs	Attribute	Level of interest	Availability and Affordability of Alternatives	Natural Resource Management / Utilization	HCV Yes/No
				<i>river. River water is picked up with pumps and housed in homes. However, residents throw all household waste into the river.</i>	
Clean water for sanitation	<i>River</i>	<i>Some people still depend on river for sanitation</i>	<i>Get water from dug wells and drilled wells. Utilizing rain water</i>	<i>Residents utilize water pumps to take water from the river, but it also utilizes the river flow directly to public sanitation.</i>	<i>Yes Some families still use river water</i>
Subsistence land	<i>Vegetables fields and fields</i>	<i>This land is important as a location for growing vegetables for consumption and sale; cucumber, chili, cassava, taro and banana</i>	<i>Utilizing the area of former rice fields for vegetable planting.</i>	<i>The former area of the field is used to grow vegetables used for the fulfilment of their own food needs</i>	<i>Yes There are people who still farming for their own needs</i>
Economic land	<i>Small holder Rubber plantation</i>	<i>There are people who use land for economic purposes by planting rubber crops as an additional income</i>	<i>Utilizing land to grow rubber</i>	<i>Rubber plantation land is not well maintained, rubber plant is allowed to grow without any treatment.</i>	<i>Yes There are people who still maintain their rubber plantation as an inheritance and income</i>
	<i>Small holder palm oil plantatiion</i>	<i>There are people who use land for economic purposes by planting palm oil as an additional income</i>	<i>Utilizing fields to growth pal oil, the land is located within the concession of PT. HKI</i>	<i>Palm oil growth using fertilizer and herbicide</i>	<i>No the location of oil palm plantations within the forest area</i>

Table 10. HCV 5 Identification of Air Hitam Block

Basic Needs	Attribute	Level of Interest	Availability and Affordability of Alternatives	Natural Resources Management/Utilization	HCV Yes/No
Rice Fields	Rice: Ketumbar, Nilon, Uimbang, Kenaikan, Bidadari, Tengkidang, Dua Sakat, Tampui, Buya, Selumang Plupuk, Rimbuk, Rajam, Undak Papai, Raia Bulan, Unggul Glutinous rice (padi pulut): Laketan Ruai, Laketan Tarap, Laketan Kijang, Laketan Tentahuwa, Laketan Baku, Laketan Tebadak, Laketan Kendaian, Laketan Begincir, Laketan Batung, Laketan Gading, Laketan Pulut Rutut, Laketan Sambas, Laketan Kapal Paca	Rice is the staple food of the community. There are still some residents who move to cultivate their carbohydrate needs.	The harvest is just enough to meet the needs for 7-8 months only. The cultivation in natai (dryland areas) has not been done anymore because of locust pest attack. The people get rice by buying to a shop or shop in each village and some are buying out of the village.	There are residents (especially the older generation) who still plant rice (melakau), the seeds used are local rice. Generally, in one year only one time to plant rice.	Yes There are residents (especially the older generation) who still plant rice (melakau)
Fresh water fish	Toman, Tapah, Baung, Kerandang, Sapat, Puyuk, Gabus, Junjung, Patung, Paluik, Siluk, Pia Lulut, Pia Api, Keparas, Janjau, Seluang, Kemembuntu, Kilat, Lele, Kemburing, Kepohong, Kemaning, Tempala, Kanjing, Bantak, Junga, Janjau Bangkar, Kulan, Tilan Api, Haruan, Cuncungarut, Kemuring, Mihau, Jungak, Kepuyuk, Piang Bantak	Fresh water fish has been a major source of protein for a long time., are mostly consumed by themselves	Fish is easy to get, Another alternative to get meat protein is to buy from a merchant.	Residents fishing by using traps and trawls, fishing rods, seurak, nets, and gulps. The fish only for own consumption. If they get more fish, then it will be sold.	Yes Fishing by using traditional system, not using chemical poison
	Non-fish: Biyuku, Labi-labi, Kura-kura	Not a basic need for protein needs.	Available alternatives. Livestock product, buying meat from seller	Not specifically hunted. These animals are taken when accidentally encountered in the river	No This species is still in consumption if found but contrary to HCV 1
Meat	Babi, Kijang, Rusa, Gagas/kancil, Pelanduk, Landak, Trenggiling, Biawak	Hunting wildlife to meet protein needs only additional, it's not a daily activity	Available alternatives. Livestock product, buying meat from seller	Hunting is done opportunistically: no limitation for size of animals being hunted, no special time for hunting, and hunting locations depend on season.	No This species is still in consumption if found but contrary to HCV 1
Vegetables	Umbut Naga, Umbut Runjai, Umbut Palas, Umbut Lupuk	Not depend on forest vegetables	People has vegetable cultivation in fields or yard. They plant taro, corn, egg plant, beans, rice, Keribang, potato, cucumber, gambas, paria,	Umbut Nanga, Umbut Runjai, Umbut Palas, Umbut Lupuk. All these vegetables get from riparian zones.	No It is no longer depend on certain types of vegetables from the forest

Basic Needs	Attribute	Level of Interest	Availability and Affordability of Alternatives	Natural Resources Management/Utilization	HCV Yes/No
			Gondok Gundur, Lapang, Kucai, chilli, turmeric.		
Fruits	Teratungan, Sebangkui, Sanik, Keranji, Tapus, Tapah Darah, Tapah Susuk, Tapah Ketak, Buah Maram Merah/Darah, Buah Maram Putih, Hakam, Jelayan, Tangkah, Cupai, Sipun, Limat, Asam Kalimantan, Air Penia	Not depend on certain fruits from forest	Cultivation of fruit crops in the yard of the house and gardens, such as Banana, Durian, Pineapple, Orange, Rambutan, Asam, Mango, Jackfruit, Duku, Pemadeh Sane, Gemalai, Sarai, Cashew. They can buy fruit from the nearest seller	Fruit trees are generally allowed to grow / not felled.	No It is no longer depend on certain types of fruits from the forest. Many people already cultivated some fruits
Work Tools and handicraft	Rattan of natai: Dahanin, Tempirik, Buaya, Sagak. Rattan of swamp: Hiur Kundang, Marau, Lantong, Bungkulan, Radam Katam, Juruk, Nanga, Rautan Lupuk	People still use and make their own tools to fishing (bubu, kecuk, penggak, etc.), farming / gardening, various baskets to bring stock or harvest (tengkalang, kindai) and others	A practical alternative is available, but people prefer to make their own tools and work tools because the raw materials are still available around the village, cheaper and more durable.	Take the rattan material as needed and choose the appropriate size of the rattan, straight, good, and old.	Yes
	Bamboo: Kinjil	People use bamboo to make basket, tangkin when they go to farm, bags of betel-nut, penangkil, penyampik / capan to clean rice, cupak to place rice or food used in traditional ceremony.	A practical alternative is available, but people prefer to make their own tools and work tools because the raw materials are still sought around the village, cheaper and more durable.	Some people, especially craftsmen, cultivated bamboo at their yard	No
	Timber – Boat: Belangiran, Meranti, Medang, Musuk	Residents use the boat as a of transportation and as a means of fishing.	There are still residents who make boat orders residents of other villages / villages. Buy a boat or buy materials in the city of Manis Mata district for 1.5-5 million or buy wooden boards from the Kumai area in Central Kalimantan.	The timber that will be used for boat is buy from residents who usually look for wood or sometimes the maker will look for it by himself. The type of timber to be used as boat material is chosen best by looking at the physical shape and size / dimensions required.	Yes Limit and choose the type and size of the wood to be felled
	Leaves : Purun, Purun Tikus, Hanyut-hanyut, Bali, Selinsing, Bengkuang, Lempiyang	Many people still use to make mats for various purposes and various tools	A practical alternative is available, but people prefer to make their own tools and work tools because the raw materials are still sought around the village, cheaper and more durable.	Take the purun material from riparian and near settlement, Purun grows widely along the river.	Yes
Building Materials:	Timber : Belangiran, Kubing, Perepat, Punak, Meranti, Resak, Ketiyau, Gimbur, Leban, Madang, Musuk, Renagak, Nyatuh, Jelutung, Kelukup, Gerunggang, Bintik, Kempas, Pepinang, Betulang Ular,	Timber is still the main raw material for most people.	The availability of wood materials has begun to decrease considerably. Location of timber extraction getting farther from settlement. Currently, many buildings are made from materials such as cement,	Harvesting timber by himself as needed in the forest or from the swamp / riverbanks. Trees that are harvested are over 25 cm in diameter to ensure the sustainability of the supply which is currently	Yes Control and choose the type and size of the timber harvested

Basic Needs	Attribute	Level of Interest	Availability and Affordability of Alternatives	Natural Resources Management/Utilization	HCV Yes/No
	<i>Makai, Sindur, Ulin, Ramin, Tembesuk, Rengas, Teratungan, Pagak, Bedaru, Tekam, Sembawang, Bunut, Tampui, Bekarai, Sandak, Kemang</i>		<i>sand, because it is more practical and easier to obtain in the building store, but the price of building materials is more expensive.</i>	<i>reduced considerably due to fires occurring each year.</i>	
	<i>Nipah to make roof</i>	<i>A small number of residents still use the leaves of nipah for the roof of the house and the roof for the hut fields.</i>	<i>There are more practical alternatives such as zinc and asbestos available.</i>	<i>The leaves are harvested from the type of nipah plants commonly found in the estuary. Nipah taken is wide and old leaf.</i>	<i>Yes</i>
Firewood	<i>Belangiran, Pansik, Tampai, Diapadang, Suluh, Seleban Darah, Aru, Jamai, Samak Malam, Ketiyau, Makai, Mengkunyit, Pemplampangan, Genderian</i>	<i>Although there is a 3kg gas fuel, but most people still use firewood because it is easy to obtain.</i>	<i>LPG gas is now commonly used by residents.</i>	<i>Firewood is obtained by collecting dead timber from around settlements, lakau or forest.</i>	<i>No</i>
Traditional Medicine	<i>Siduk, Kaman-kaman, Pelambat, Kasai 40/ Sapai 40, Membuntu, Akar Kutuk-Kutuk, Kayu Tengkujat, Kayu Penandur Urat, Gamat Belanda, Musuk, Akar Kendamaian, Bangkal, Sambung, Siduk, Butuh, Jamai, Samak, Penebar Balik, Akar Biawak</i>	<i>There are still many people who use traditional materials / medicine that come from nature / forest.</i>	<i>Using medicines purchased from nearest shop. People go to nearest health centre to take medical treatment</i>	<i>Citizens have knowledge about the nutritious plants to treat certain types of diseases. Some types of plants are taken as needed and some are collected for storage.</i>	<i>Yes</i>
Clean water for cooking and drinking	<i>River</i>	<i>People depend on river for cooking and drinking especially when drought season</i>	<i>Get water from dug wells and drilled wells. Buy water refills</i>	<i>People take water as needed from river. They walk or riding motorcycle to river then put the water in 20ltrs can or 1.5ltrs bottles</i>	<i>Yes</i>
Clean water for Washing	<i>River</i>	<i>cooking and drinking especially when drought season for sanitation</i>	<i>Get water from dug wells and drilled wells. Utilizing rainwater</i>	<i>People using pump to get water from river for their toilet</i>	<i>Yes</i>
Direct income	<i>Sus barbatus, deer, pelanduk, hedhog, pangolin, lizards</i>	<i>Meat from hunting is a side income for some people and as a hobby</i>	<i>Hunting is a side activity, in addition to farming the fields, working in companies, entrepreneurs, and others</i>	<i>People hunting opportunistically, no limit to the size of the animal being hunted. They hunt by burning the meadow, a week after will grow a new grass that becomes favorite of animals, such as deer. This method is dangerous for surround, can caused fire</i>	<i>No</i>

Basic Needs	Attribute	Level of Interest	Availability and Affordability of Alternatives	Natural Resources Management/Utilization	HCV Yes/No
	Toman, Tapah, Baung, Kerandang, Sapat, Puyuk, Gabus, Junjung, Patung, Paluik, Siluk, Pia Lulut, Pia Api, Keparas, Janjau, Seluang, Kemembuntu, Kilat, Lele, Kemburing, Kepohong, Kemaning, Tempala, Kanjing, Bantak, Junga, Janjau Bangkar, Kulan, Tilan Api, Haruan, Cuncungarut, Kemuring, Mihau, Jungak, Kepuyuk, Piang Bantak	Some people has a main livelihood as a fisherman.	Fishing in the river is main activity for some people. Although there are companies around and they can work at the company, they choose fishing as their source of livelihood.	For people at Hantak and Sukamaju sub village, fishing is the main activity for their livelihood. Although there are companies around and they can work at the company, they choose fishing as their source of livelihood.	Yes
	Pasir Puya	The main livelihood for some residents.	Is a main economic activity for some residents. Although the price of puya 'is declining, they do not have much choice of employment due to limited knowledge and skills.	Mining is conducted along the Air Hitam Kanan River. Mining done mechanically: using diesel engines for sluicing / spraying along river banks.	No
	Nipah Leaves	Additional income for some people	Nipah is easy to get along the river to estuary	Nipah found in estuary. People harvesting the old and wide leaves	Yes
Subsistence land	Field for rice cultivation	Paddy fields are important as rice cultivation areas to meet basic food needs.	No other farming areas. The cultivation in natai (dryland areas) has not been done anymore because of locust pest attack. Villages buy in village store.	There are residents (especially the older generation) who still plant rice (melakau), the seeds used are local rice. Generally, in one year only one time to plant rice. Rice cultivation in a few spots and no longer under shifting cultivation system.	Yes
Economic Land	Small holder Rubber plantation	There are people who use land for economic purposes by planting rubber crops as an additional income	Utilizing fields to grow rubber	Rubber plantation land is not well maintained, rubber plant is allowed to grow without any treatment.	Yes There are people who still maintain their rubber plantation as an inheritance and income
	Small holder palm oil plantation	There are people who use land for economic purposes by planting palm oil as an additional income	Utilizing fields to grow palm oil, the land is located within the concession of PT. HKI	Palm oil growth using fertilizer and herbicide	No the location of oil palm plantations within the forest area

Table 11. HCV 5 Summary

Groups	Kendawangan		Air Hitam	
	Attribute(s)	HCV Area /Location	Attribute(s)	HCV Area/Location
1. Rice	-	-	Rice fields and Pulut	
2. Fresh Water fish	<i>Seluang, parau, toman, gabus, tapah, bantak, keparas, patung, kekapar, belida, siluk, biawan, kepuyuh, baung, junjung, palok, rampai</i>		<i>Toman, Tapah, Baung, Kerandang, Sapat, Puyuk, Gabus, Junjung, Patung, Paluik, Siluk, Pia Lulut, Pia Api, Keparas, Janjau, Seluang, Kembuntu, Kilat, Lele, Kemburing, Kepohong, Kemaning, Tempala, Kanjing, Bantak, Junga, Janjau Bangkar, Kulan, Tilan Api, Haruan, Cuncungarut, Kemuring, Mihau, Jungak, Kepuyuk, Piang Bantak.</i>	
3. Fresh water for drinking and cooking	River and spring		river	
4. Fresh water for sanitation	river		river	
5. Construction Material	timber		Timber and nipah	
6. Work tools and craft	Timber, Rattan, leaves (perupuk, pandan, purun, jakas, mengkuang)		<i>Timber, Rattan, leaves (Purun, Purun Tikus, Hanyut-hanyut, Bali, Selinsing, Bengkuang, Lempiyang)</i>	
7. Medicine	- Pucuk ketuat, pucuk sambung, pucuk kecaping, pasak bumi, akar kuning, brotowali, langir, daun sirsat, daun siri, akar tatak, gambir, pucuk guala, Daun Cucer, Daun Simpung for deer bait, Serai, Pahiyau (akar wangi), Pasak Bumi, Akar Tengku Biawak, Akar Temia	-	<i>Siduk, Kaman-kaman, Pelambat, Kasai 40/ Sapat 40, Membuntu, Akar Kutuk-Kutuk, Kayu Tengkujat, Kayu Penandur Urat, Gamat Belanda, Musuk, Akar Kendamaian, Bangkal, Sambung, Siduk, Butuh, Jamai, Samak, Penebar Balik, Akar Biawak</i>	
8. Direct income source	- Rubber plantation	-	Nipah, fresh water fish, rubber plantation	
9. Subsistence land	Vegetable field		Rice field	

5.7 Explanation for HCV 6 Identification – Cultural Values

HCV 6 – Present	
Definition	Criteria
<p><i>Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.</i></p>	<ul style="list-style-type: none"> - Sites, resources, habitat and landscape with high cultural value, recognized by national policy and legislation - Sites, resources, habitat and landscape established legally from national government and/or international institution such as UNESCO - Sites, resources, habitat and landscape with recognized important historical and cultural value, even if not protected by legislation. - Religious or sacred sites, resources, habitat and landscape (cemetery, or site for traditional rites, which is important to local community) - Plants or animal with totemic value or used in traditional ceremonies.

HCV 6 attributes can be places / lands, natural resources or objects, and habitats that are important cultural places for tribal, sacred places, and species of plants or animals related to tradition / culture - even identity as indigenous communities / tribe.

Table 12. Summary of Identified HCV 6 Attributes and Locations in PT HKI

No.	Group	Kendawangan		Air Hitam	
		Area/Location	Attribute	Area/Location	Attribute
1	Sacred Sites	Desa Mekar Utama:	Batu Peniatan Selinsing, Batu Peniatan Pembunuhan Badak	Air Hitam Hulu	Hutan Keramat Padang Ipuk, Hutan Adat Natai Pinang, Ipuk Di Batu
		Desa Banjarsari:	Air Terjun Peniatan Landau Sawa, Batu Peniatan Kuping Kupang	Air Hitam Besar	Bagan Selinsing and Tanjung Duku Kuala Mading Danau Burung Hutan Adat Natai Belian Hutan Adat Cangkam Babi
		Desa Selimatan Jaya:	Hutan Adat Tohong Air Hitam	Air Tarap	Tetabusan: Pohon Keramat Pulai and Ulin (Bantan)
		Desa Kedondong:	Batu Peniatan Air Ketitak, Batu Buaya, Pelaik Genting, Batu Peniatan Air Berguruh		
		Desa Pangkalan Batu:	Kuala Batu, on S. Pangkalan Batu, Hutan Adat: Dungun Besar, Bukit Jering		
2	Culturally important locations	Mekar Utama	Kampung Lama/Tua Suku Dayak, Bagan Ramai	Air Hitam Hulu:	Tetabusan Kawasan Keramat Ilang Betakok
		Banjarsari	Kampung Lama/Tua Suku Dayak: Kampung Batu	Air Hitam Besar	Tetabusan Darat and Air Pohon Keramat Pulai dan Ulin (Bantan)
		Selimatan Jaya:	Kampung Lama/Tua Suku Dayak		
		Kedondong	Kampung lama/tua suku dayak, Bagan Durian		
		Sungai Jelayan:	Kampung lama: Pengerawan, Naning, Lembayang, Mengkabang, Runjai, Bukit Kekurak, Bagan Buluh, Mangkuk, Bagan Umar, Ubar Manis, Arai Pelanai, Titi Urat, Kubangan, Tong		

No.	Group	Kendawangan		Air Hitam	
		Area/Location	Attribute	Area/Location	Attribute
			<i>Pilasan, Air Putih, Durian Tujuh, Rumah Tinggi, Pakit, Jurung, Lakap, Busung Tanah, Biulak, Bagan Rukam, Kebauk, Pak Ruik, Bukit Tebadak, Sungai Menggaris, Mungguk, Serandik, Bagan Lalang, Bagan Buluh, Bagan Dukuk, Lembawang, Kalimantan, Terantung, Landau Piar</i>		
		Pangkalan Batu:	Kampung Lama/Tua Suku Dayak: Kampung Dungun Lama/Besar, Teluk Benyawai. Tanjung Lipat Gunting, Bagan Tarap, Dukuh Birai, Peruas		
3	Important species for traditional culture	Desa Mekar Utama	Butun, kaman-kaman for stomach upset, Pucuk sembung, Junai, Tarap, Pelai, Kumpang Tudung, Ketimbang, Mali-mali, Akar Kulit, Tepus jungkut, Punang	Air Hitam Hulu	Timber (sensabang, kayu idup-idup, jelumpang, kelaban/jamai, siduk, tetanjan, segulang kampung, dan malik-malik)-bamboo (buluh, paring, temiyang, kinjil, batung, haur, habik, paring hanyang), balang, kunyit, rumput gragat ganting, rumput sarang-sarang-Buah, batang, dan akar Murai Batu (Voice signifies to be more careful doing activities). Burung Kelakak (voice can indicate the success of treatment). Eagle (The eagle's sound is a bad omen) Klempiau (Some sounds are omen of coming disaster)
		Desa Banjarsari	Pucuk jambu, buah keribijak, bulangan, buah tanjan, akar taban-taban, akar langie, patar wali, pasak bumi, akar tengkuk biawak, akar temiang, akar lalang, kencur, jahe, kunyit	Air Hitam Besar:	Timber(sensabang, kayu idup-idup, jelumpang, kelaban/jamai, siduk, tetanjan, segulang kampung, dan malik-malik)-Batang/dahan /akar Bamboo (buluh, paring, temiyang, kinjil, batung, haur, habik, paring hanyang)-Batangnya Pinang, kelapa, kumpang balang, kunyit, rumput gragat ganting, rumput sarang-sarang-Buah, batang, dan akar Murai Batu (Sound), Burung Kelakak, Eagle (sound) Klempiau (sound)
		Desa Kedondong	Greget genting, kunyit bauk, idup-idup, tarap Pucuk jambu, buah keribijak, bulangan, buah tanjan, akar taban-taban, akar langie, patar wali, pasak bumi, akar	Air Tarap	Timber (sensabang, kayu idup-idup, jelumpang, kelaban/jamai, siduk, tetanjan, segulang kampung, dan malik-malik)-Batang/dahan /akar

No.	Group	Kendawangan		Air Hitam	
		Area/Location	Attribute	Area/Location	Attribute
			tengkuk biawak, akar temiang, akar lalang, kencur, jahe, kunyit		Bamboo (buluh, paring, temiyang, kinjil, batung, haur, habik, paring hanyang)- Batangnya, Pinang, kelapa, kumpang balang, kunyit, rumput gragat ganting, rumput sarang-sarang-Buah, batang, dan akar Murai Batu (Sound), Burung Kelakak, Eagle (sound) Klempiau (sound)
		Desa Sungai Jelayan:	Kayu: tabai-tabai, mali-mali, segulang, kumpang, kayu lari, garung, paring, ketimbang, gaharu. Buah untuk upacara adat; sebangkui, kekalik Plants:: idup-idup, gurun benua Padi : ketan merah, ketan putih		
		Desa Pangkalan Batu	Tetabus use kayu paring		
4	Sacred Burial sites / tomb	Mekar Utama:	<i>Kampung Lama, Air Runjai, Makam Paela, Makam Hamzah</i>	Air Hitam Hulu	Air Di Maram
		Sungai Jelayan:	Naning, ubar manis, pengerawan, cuncung, air merah, teluk bayur, kempas, bagan lalang, bagan buluh bagan dukuk, lembawang, kalimantan, teratung, landau piar		
		Pangkalan Batu:	Kuburan Lama/Tua: Kuburan Dungun besar/lama, kuburan birai, Peruas, makam bukit Jering, makam suku dayak di setiap dusun		

5.8 Stakeholder Consultation

Consultation with Key Stakeholders and *interest groups* was carried out through a variety of approaches before and during the assessment. Consultation with local communities and key traditional community figures was done during FGD and participatory surveys of HCV 5 and 6. HCV Assessment results at the village level were consulted with a broad group of village members (8-16 September 2017) to obtain agreement on the results – freely and without coercion, so that the consequences of HCV identification and their management were fully understood. Inputs of the consultation have been incorporated in the final assessment report.

For wider stakeholder consultation, stakeholder consultation workshops were held prior to (11 April 2017) and after the assessment (30-31 October 2017) and attended by government organisations, NGOs, high education, traditional community organisations, faith-based organisations, and private sector operating in the landscape. Community representatives, Village government, and Sub-district government were also in attendance during the post-assessment stakeholder consultations.

During the post assessment consultation workshop, results of HCV identification and their distribution (HCVA) were presented. Threats to the HCV and recommendations for management and monitoring – including all maps that showed management areas of HCV were discussed.

Table 13. Summary of Stakeholder Consultation for PT HKI

Type of Consultation	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
Workshop (11 April 17)	Susana Heni (Dinas KPP Ketapang)	Increase socialization to minimize impact, Management to protect and maintain HCVs, Ease of access to areas designated as HCVs, Farming areas should be considered for food security	Inform participants that several stages of activities conducted with the community, Informing that the HCV area is still accessible to the public but with some arrangements, Incoming farming areas as HCV areas remain in their function
Workshop (11 April 17)	Sri Kusnadi (Manggala Agni Ketapang)	Participatory mapping for high risk area to fire, making easier to find water	Accommodated in the HCV management and monitoring recommendation
Workshop (11 April 17)	Adi Susila (BKSDA Ketapang)	In the Air Hitam landscape, Proboscis Monkey is conservation priority species. HKI should build animal corridors to Muara Kendawangan nature preserve. In the Kendawangan landscape there is a sun bear (based on 2016 BKSDA survey), and there are 68 types of feed so worth to be maintained. HKI 6 and HKI 9 are used as Bear Monitoring Site. CR species found in HKI are: orangutan, pangolin, 145 Proboscis Monkey.	Checking for possible presence of bears and oOrangutan during surveys. Consider advice from BKSDA as recommendation material. Accommodated animal corridor in the HCV management and monitoring recommendation
Workshop (11 April 17)	Desi Kurniawati (Yayasan Palung)	Identification of ecosystems and HCVs need to be as accurate as possible. Concession activities can cause increased damage in protected areas. Special MOUs should be made between government agencies and companies for the management of 2 protected forest and CA MK for the protection of the area, so that the protected area can be well maintained.	Identify ecosystems according to the time available Conduct HCV assessments as best as possible within the time available Incorporate recommendation of landscape management of protected area management.
Workshop (11 April 17)	Zulfahmi (Yayasan International Animal Rescue Indonesia (YIARI))	<ul style="list-style-type: none"> ▪ Existence of CR species and the existence of forest cover adjacent to HL and CA indicates that concession areas are important for conservation ▪ Based on existing Orangutan distribution maps, orangutan exist in PT HKI concession area – so remaining forest areas are important for conservation. ▪ Judging from the concession cover adjacent to CA and HL, it is necessary to establish habitat (corridor) for these animals. ▪ Wildlife corridors in the landscape should not be fragmented as a result of concession management ▪ The Orangutan conflict in Kendawangan is quite high. ▪ From analysis carried out by IAR, conflict between orangutan and humans in Kendawangan is high. 	Accommodated wildlife corridor in the HCV management and monitoring recommendation