

SUMMARY OF ASSESSMENTS AND MANAGEMENT PLANS

**Proposed New Plantings by PT Nabire Baru,
Papua Province, Indonesia**

Third Submission: February 2020

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1. OVERVIEW AND BACKGROUND

1.1 Summary

A new development is proposed by PT Nabire Baru (PT NB), a subsidiary of Goodhope Asia Holdings, Ltd. (Goodhope) located in the province of Papua, Indonesia.

As a member of the Roundtable on Sustainable Palm Oil (RSPO), Goodhope is committed to implementing sustainable management practices across its operations. The Group operates oil palm plantations in four provinces in Indonesia: Central Kalimantan, East Kalimantan, West Kalimantan and Papua. The two concessions in Papua (PT NB and PT Sariwana Adi Perkasa) are located adjacent to one another to the East of Nabire town (Figure 1).

Based on Papua Province Spatial and Regional Planning (Rencana Tata Ruang dan Wilayah, RTRW), the area is classified as settlement area (from Nabire city to the east area of Wanggar River) and cultivation area (areas adjacent to Wanggar River) for plantations. The PT NB concession is adjacent to three Transmigrant Villages – Wami Village, Yaro Makmur Village and Jaya Mukti Village and two villages with customary rights (hak ulayat) – Wanggar Pantai Village (Wate Indigenous Tribe) and Sima Village (Yerisiam Gwa Indigenous Tribe).

PT NB obtained Location permit (SK Bupati no 74/2010 date 14 June 2010) for 17,000 Ha area at Sima Village and Wami Village, both at Yaur District; and Wanggar Pantai Village, Yaro Makmur Village, Jaya Mukti Village, Yaro District. The permit was extended through SK Bupati no 71/2012 dated 24 July 2012. In 2014, BPN granted Right of Land Use (HGU, *Hak Guna Usaha*) certificate for 14,524.67 Ha (SK Kepala BPN No.159/HGU/BPN RI/2014), which consists of 11,610.32 ha core area and 2,914.35 ha smallholders area (plasma).

Land clearing for nursery establishment and planting of oil palm by PT NB commenced in 2011 prior to RSPO membership and followed the land-use plan of the first High Conservation Value (HCV) assessment. Oil palm has been planted on 7,016 ha area (6,158 ha inti and 857 ha plasma).

In 2016 Goodhope suspended its plantation expansion operations due to concerns from external stakeholders: See [RSPO complaint against the operations of PT NB \(April 2016\)](#) and [precautionary approach \(stop work order\) - April 2017](#). A precautionary approach was adopted by implementing a moratorium on land clearance to avoid causing negative social and environmental impacts.

Continued efforts have been made to address environmental concerns, improve levels of mutual understanding and repair relations between the company and local communities. As part of the complaint resolution processes, Goodhope has addressed the allegations against PT NB and met requirements set by the RSPO Complaints Panel regarding the precautionary approach adopted (Stop Work Order).

The company completed new Social Impact Assessment (SIA); High Conservation Value (HCV) Assessment; Land Use Change Analysis (LUCA); High Carbon Stock (HCS) Assessment; Soil Assessment; and Greenhouse Gas (GHG) Assessment. Methods and findings for all assessments are presented in Section 2 and 3 of this report.

The HCV Assessment identified HCV 1, HCV 2, HCV3, HCV4, HCV 5 and HCV 6 in the assessment area, including viable populations of endangered, restricted range or protected species (6 Vegetation species, 4 Mammals and 30 Bird species), areas of peatland, lowland forest, mangrove and estuarine ecosystems. Species with cultural importance include Bird-of-paradise and Sago (*Metroxylon sagu*) and a number of sacred places and important sites for local culture have been identified.

A total of 4,940 is to be managed as conservation set-aside area (High Carbon Stock / High Conservation Value /peatland) as determined by new HCV assessment approved by HVRN and peer reviewed HCSA Assessment. Goodhope's Sustainability Policy has been communicated to local stakeholders to ensure cooperation in landscape level for conservation management.

Remediation liabilities and compensation liabilities for PT NB and SAP have been identified upon review of land use change analysis (LUCA) up to the date of the new HCV assessment. Remediation and compensation plan is under evaluation (concept note approved).

The stop work order for PT NB and PT Sariwana Adi Perkasa (SAP) has been lifted since 27th December 2018. Furthermore, the RSPO complaint against PT NB (lodged April 2016) has been closed for monitoring following community's withdrawal of the complaint in August 2018 and signing of MoU Community involvement.

Communities around the concession areas continue to place large hope for future income from plasma plantations and seek completion of plasma plantations. In this proposed plan for new plantings, the company seeks to develop plasma plantations to fulfill its obligations to the communities for plasma plantation development, while maintaining commitments to no development on HCV areas, HCS forest or peatland.

In PT NB concession, 2,238 ha of land has been identified for potential new plantings to provide plasma for local communities. The proposed new plantings are planned in accordance with the company's Sustainability Policy and RSPO New Planting Procedures. The proposed development areas are mineral soil, have not been classified as HCV area or HCS forest, and do not directly border protected areas.

Implementation of the planting plan will provide a total 9,253 ha of oil palm in the PT NB concession (6,158 ha inti and 3,095 ha plasma): 4,940 ha will be managed as conservation area (High Carbon Stock / High Conservation Value /peatland).

The proposed new planting plan depicts the maximum plantable area for the development. We indicate the potential land available for planting (2,238 ha) and a timeline for planting plan as required. However, the implementation of the development plans will be further confirmed through a due process to meet all operational and business standard requirements. The new development will be undertaken upon performing a consultative process with local community and other concerned stakeholders.

Table 1. Organizational information and contact persons

Name of RPSO member	Goodhope Asia Holdings Ltd.
RSPO membership number	1-0175-14-000-00
Date of joining RSPO	December 2, 2014
Name of subsidiary/management unit	PT Nabire Baru (NB)
Country of subsidiary/management unit	Indonesia
Province and district of subsidiary/management unit	Yaur District and Yaro District, Kabupaten Nabire, Papua Province.
Total area of management unit (ha)	PT Nabire Baru area: Legal HGU: 14,524.67 ha, GIS 14,609 ha.
Contact person	Abrar Ramlan (abrar.ramlan@goodhope.co)

Table 2. List of Land Permits

No.	License and Recommendation	Issued By	Number	Date
1.	Deed of Establishment	Notary Agustina, SH	Act No. 87	23 rd July 2008
2.	Location Permit	Head of Nabire Regency	No. 74 Year 2010 covering of 17,000 ha area	4 th June, 2010
3.	Extension of Location Permit	Head of Nabire Regency	No. 71 Year 2012 covering of 17,000 ha area	24 th July 2012
4.	Plantation Business Permit (IUP)	Governor of Papua	No. 02/SK.IUP/KS/2014 covering of 17,000 ha area	15 th April 2014
5.	Environmental Permit	Governor of Papua	No. 503/ 315/ year 2014	26 th August 2014
6.	Land Use Title (HGU)	National Land Authority	No. 159/HGU/BPN RI/2014 covering of 11,610.32 ha for Inti (Nucleus) and 2,914.35 ha for scheme Smallholders (Plasma)	24 th October 2014

1.2. Location Map

PT NB is located to the East of Nabire town in Yaur District and Yaro District, Nabire Regency, Papua Province, Indonesia. Yaur District is the westernmost district in Nabire Regency, and adjacent to Teluk Wondama Regency, West Papua Province.

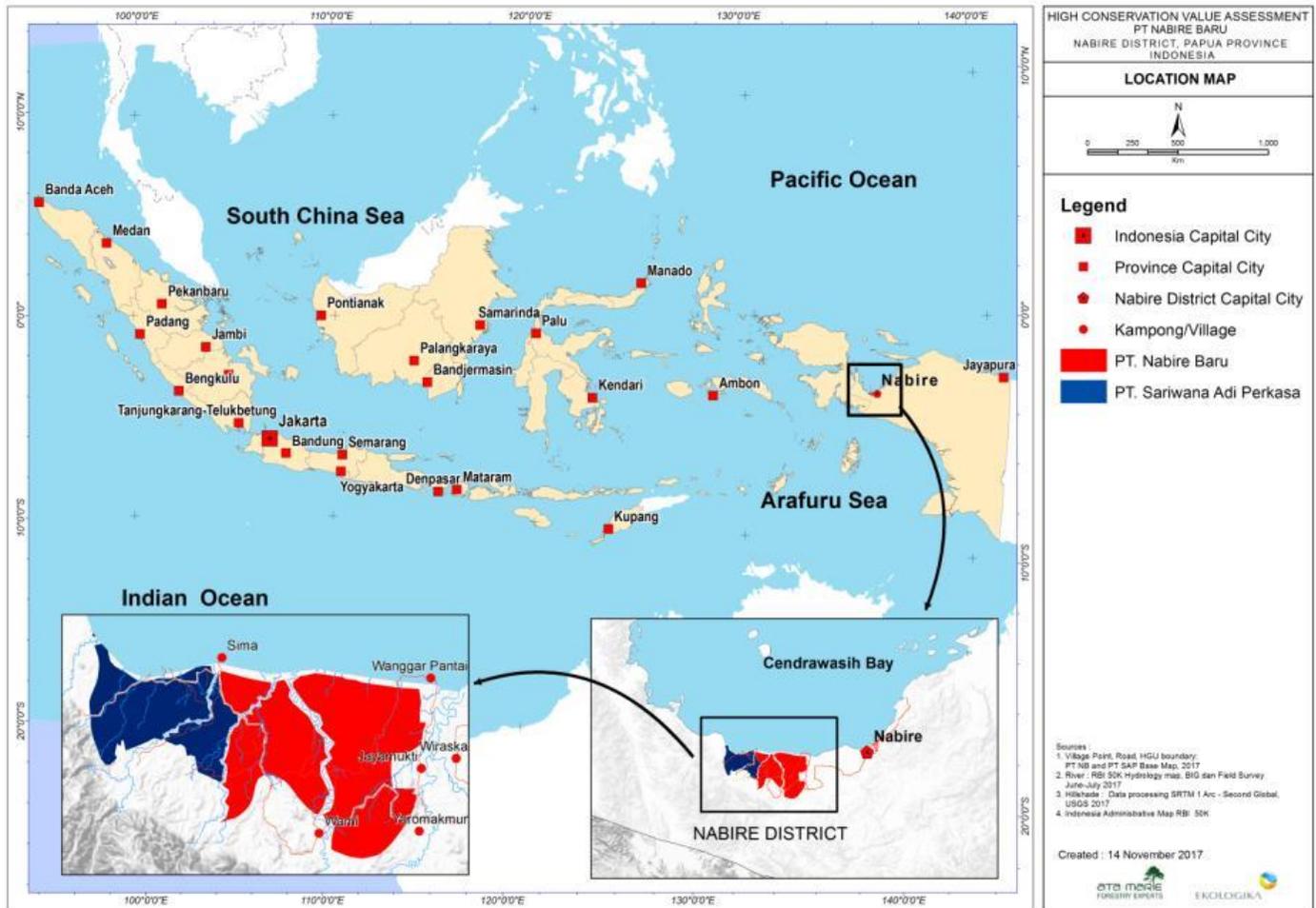


Figure 1. Location Map of PT Nabire Baru

1.3 General Description of the Landscape

Based on Papua Province Spatial and Regional Planning (Rencana Tata Ruang dan Wilayah, RTRW), the area is classified as settlement area (from Nabire city to the east area of Wanggar River) and cultivation area (areas adjacent to Wanggar River) for plantations. According to Papua Province RTRW, production forest areas (HP, HPT and HPK) were included in cultivation area, while protected forest areas and marine reserve were established as protected area. Indicative Map of New Permit Postponement (PIPIB) revision 13 designated on 4th December 2017 has shown that HGU of PT NB area is outside of

the Primary Forest area, Conservation Forest or Protected Forest. The Land Title (HGU) of PT NB located in coordinate 135°10'0"-135°18'0" East dan 3°23'0"-3°31'0" South.

Figure 2 shows the land use zoning in the area surrounding PT NB. The concession area is on 'Area Penggunaan Lain' (APL) land. Land to the east (from Nabire to S. Wanggar) is also APL and there are numerous villages in this area (ex. transmigration project villages). Land to the west of NB/SAP is zoned for forest protection (HL). To the immediate south there is narrow strip of production forest and small patches of unallocated APL (other land use) and HPK (conversion forest) land. The PT Jati Dharma Indah logging concession area (IUPHHK license) extends into these production forest areas. Steep mountains rise on average from 5km south of the southern boundary. These areas are zoned as protected forests (HL). The PT NB concession does not directly border protected areas.

Geological Map 1:250.000 from Pusat Penelitian dan Pengembangan Geologi Bandung (Bandung Geological Research Centre) in 1990, Pages Eranatoli and Kaimana shows that the location of Landscape PT NB is dominated by gravel, sand, silt and clay alluvial deposits and organic deposits (Qa) of Quaternary Age and Rocks of the Bumi Mudstone Formation (TQbm); and small of Paleozoic rock formations which are inseparable (Pzu) in the southwest side.

In general, the climate in the area and surrounding areas of PT NB based on Schmidt and Fergusson, is classified as type A climate which is a wet tropical climate without dry month with natural vegetation of tropical rainforest. The wet months (> 100 mm / month) which is the rainy season in this area occurs almost all year round, the dry months (<60 mm / month) never occur because the dry months in this area are less than 60 mm /month. The last 10 years' rainfall data (2007-2016) shows that the highest annual rainfall is 5,819 mm in 2010 and the lowest is 3,484 mm in 2014. The average air temperature during the period 2007-2013 ranges from 24.4 ° C. The maximum temperatures during the day are 32.2 ° C and the minimum air temperature at night is 15 ° C.

The Landscape area contains several ecosystem types, namely: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains.

PT NB concession is adjacent to the area of Wanggar Pantai Village, Yaro Makmur Village and Jaya Mukti Village – all in Yaro District. In Yaur District, assessment area is adjacent to Wami Village and Sima Village (Figure 3). In general, villages near PT NB area can be classified into two: Village with customary right (hak ulayat) – Wanggar Pantai Village and Sima Village; and Transmigrant Village – Wami Village, Yaro Makmur Village and Jaya Mukti Village. Sima Village belongs to a Papuan indigenous tribe, Yerisiam Gwa Tribe, which consists of four sub - Tribes (Waoha, Sarakwari, Akaba and Koroba). Wanggar Pantai Village belongs to other indigenous tribe, Wate Tribe.

Until 2005, 95% of NB permit area was forest (14,128 ha). Currently, most of the forest had been harvested. Historically, timber activities began during 1990s and at present still occurs sporadically as small scale illegal logging.

Land cover was drastically altered due to the development of oil palm plantation. Most land clearing activities occurred between 2011 to 2016. Most area within the plantation formerly was secondary forest. Land clearing on primary forest also occurred.

Agricultural activities by local communities have not caused significant impact to land cover having only been conducted in micro scale at various locations, most located beyond permit area. Sago plants were

cultivated in mangrove area near the coasts. Local communities are still dependant to natural resources, especially forest, river and sea to fullfill their livelihood needs and their traditional culture values.

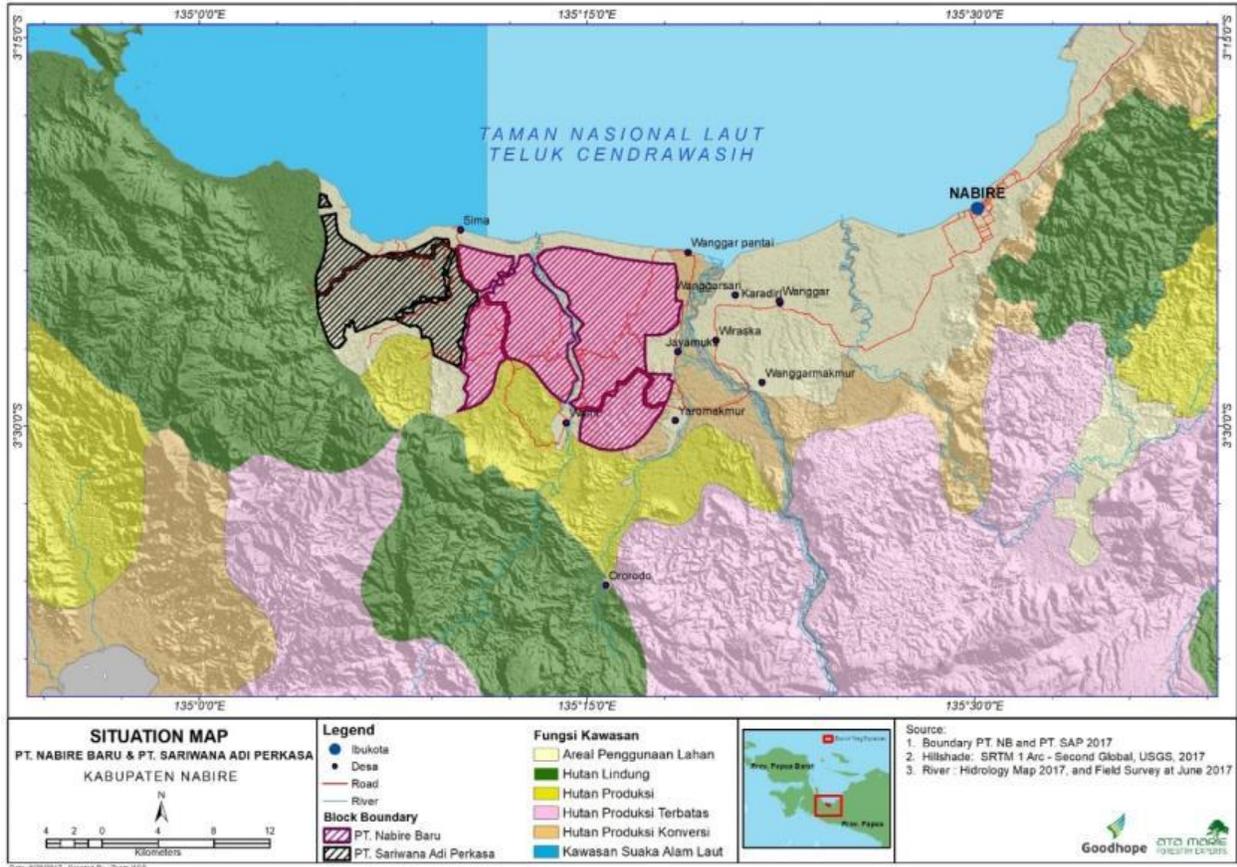


Figure 2. Land use zoning in area surrounding PT Nabire Baru and PT Sariwana Adi Perkasa

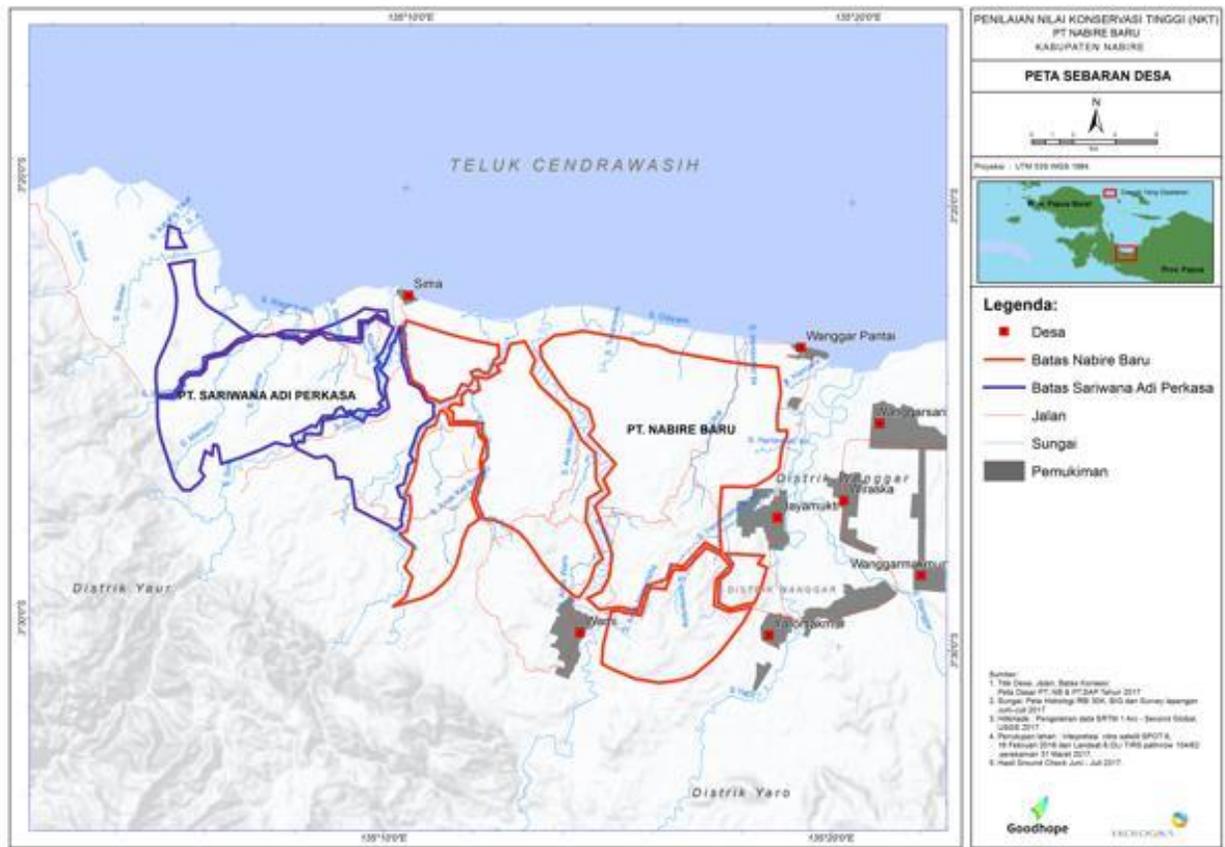


Figure 3. Point of Villages in and around PT Nabire Baru

The current land cover of the landscape includes secondary forest, young regenerating forest, scrub, open land, agriculture, palm oil, infrastructure, settlement, road and water bodies, briefly described as follows (Figure 4):

- a) Secondary Forest (FOR): Subject to logging areas, both ex logging concession by coporation and small-scale logging by local community. The area dominated with vegetation from family myristicaceae, myrtaceae and residual dipterocarpaceae. Lowland forest with average above ground carbon stocks 77.6 tC/ha.
- b) Young Regenerating Forest (YRF): Subject to logging areas with heavier disturbance than in secondary forest. Vegetation dominated by species from myristicaceae and myrtaceae family. Starting to recover itself shown by pioneer species found such as *Macaranga sp* and *Vitex sp*. Average above ground carbon estimated 44.2 tC/ha.
- c) Scrub (SCR): Reverting early stage of recovering land after clearing. Pioneer species dominated in this land cover category such as *Macaranga sp*. Average above ground carbon estimated 8 tC/ha.
- d) Open land (OL): Predominantly ex logging areas scattered around concession. Assumed to be 0 tC/ha carbon stocks.
- e) Agriculture (AGRI): Shifting cultivation small areas along provincial road. Assumed to be 0 tC/ha carbon stocks.

- f) Oil Palm (PALM): Planted areas of PT Nabire Baru and Sariwana Adi Perkasa from 2011 to 2016. Estimated carbon stocks computed by year of planting.
- g) Infrastructure (IA): Company infrastructure and amenities inside concession. Assumed to be 5 tC/ha carbon stocks.
- h) Settlement (SET): Community habitation areas with 5 tC/ha carbon stocks estimated.
- i) Road (RD): Main road areas inside concession with 2.5 tC/ha carbon stocks estimated.
- j) Water Body (WB): Main river areas inside concession. Assumed to be 0 tC/ha carbon stocks.

All remaining forest areas in PT NB have been subject to logging to some degree, both by logging concession operations in the past (between 1982-2001), and more recently (and ongoing) by small scale illegal logging operations. Beyond the concession area, the local landscape is highly forested.

Although PT NB concession does not border protected forest, the landscape is adjacent to Teluk Cendrawasih Marine National Park in the north and Sima Protected Forest in the west. The protected forest in the west has relatively pristine habitat for several wildlife species in the area, such as cassowary (*Casuaris sp*) and Rangkong Papua (*Rhyticeros plicatus*), cuscus (*Spilocuscus sp*) and tree kangaroo (*Dendrolagus sp*). Black Spotted Cuscus (*Spilocuscus rufoniger*), a critically endangered species according to IUCN Red List, is also suspected present in the forest.

Teluk Cendrawasih Marine National Park is considered very important since it has a high level of endemic and threatened biodiversity, such as Whale Shark (*Rhincodon typus*), Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Leatherback Sea Turtle (*Dermodochelys coriacea*), Olive Ridley Sea Turtle (*Lepidochelys olivacea*), Dugong (*Dugong-dugong*), Ocean Sunfish (*Mola-mola*), Giant Clam (*Tridacna gigas*), as well as more than 1000 fish and 500 coral reef species.

The HCV Assessment identified HCV 1, HCV 2, HCV3, HCV4, HCV 5 and HCV 6 in the assessment area, including:

- Viable Populations of Endangered, Restricted Range or Protected Species (6 Vegetation species, 4 Mammals and 30 Bird species).
- Representation of natural species (the presence of cassowary, species of Accipitridae family, species of Ducula genus, lorries and cockatoo, Kangaroo, hornbill and bird-of-paradise).
- Rare, threatened, or endangered ecosystems, habitats (Mountainous Lowland Forest, Mangroves and Estuarine, Lowland Grassland on Plains and Water bodies/lakes).
- Ecotone between lowland swamp forest and lowland forest.
- Water bodies and water banks, mangrove and estuarine ecosystem, swamp forest Important for the Provision of Water and Prevention of Floods for Downstream Communities.
- Hilly area with Erosion Hazard Level value > 180 ton/ha/year Important for the Prevention of Erosion and Sedimentation
- Lowland forest, swamp forest, rivers and their waterbanks that Function as important Natural Barriers to the Spread of Forest or Ground Fire
- Area and natural resources fundamental for fulfilling basic needs, irreplaceable and traditionally/ sustainably managed by local people are present. Included are: Sources of carbohydrate, protein, vitamin, direct income, potable water for drinking and cooking, clean water for sanitation, craft materials, subsistent land, fuel, traditional medicine, building materials (timber and non-timber), fodder.
- A number of sacred places and Important sites for local culture
- Species with cultural importance: Bird-of-paradise, Sago (*Metroxylon sagu*)

Several wildlife species in the area, such as cassowary (*Casuarius sp*) and Rangkong Papua (*Rhyticeros plicatus*), are important in distributing seeds. Both species are at risk due to habitat loss. Some species of cuscus (*Spilocuscus sp*) and tree kangaroo (*Dendrolagus sp*), which need good forest condition, will also be threatened due to easier hunting access, habitat changes and forest degradation. PT NB plantation area is adjacent to SAP area in the west and situated in same landscape. PT NB also adjacent to protected forest in the west, which which have relatively pristine habitat for aforementioned important species. Black Spotted Cuscus (*Spilocuscus rufoniger*), a critically endangered (CR) species according to IUCN Red List, is also suspected present in the forest. Local communities are still dependant to natural resources, especially forest, river and sea to fullfill their livelihood needs and their traditional culture values.

National Peat Ecosystem Function Map shows the indicative presence of a Peat Hydrological Unit, ie. Wanggar River-Bumi River PHU (KHG 91.04.04), with total 7,289 ha, consists of 2,092 ha conservation function and 5,198 ha cultivation function.

Soil studies in PT NB and PT SAP identified total peat distribution in both concessions 1,183 Ha (1,152 Ha in PT NB and 31 Ha in PT SAP). The peat depth varied from 6 – 325 cm with percentage of organic soil maturity hamic (67%) and sapric (33%). Gravimetric method test was conducted to identify loss off ignition (LOI) indicated survey area in classified peat area with LOI <65% such as muck. Peat ground water level varied from 0 – 100 cm in the location of assessment area.

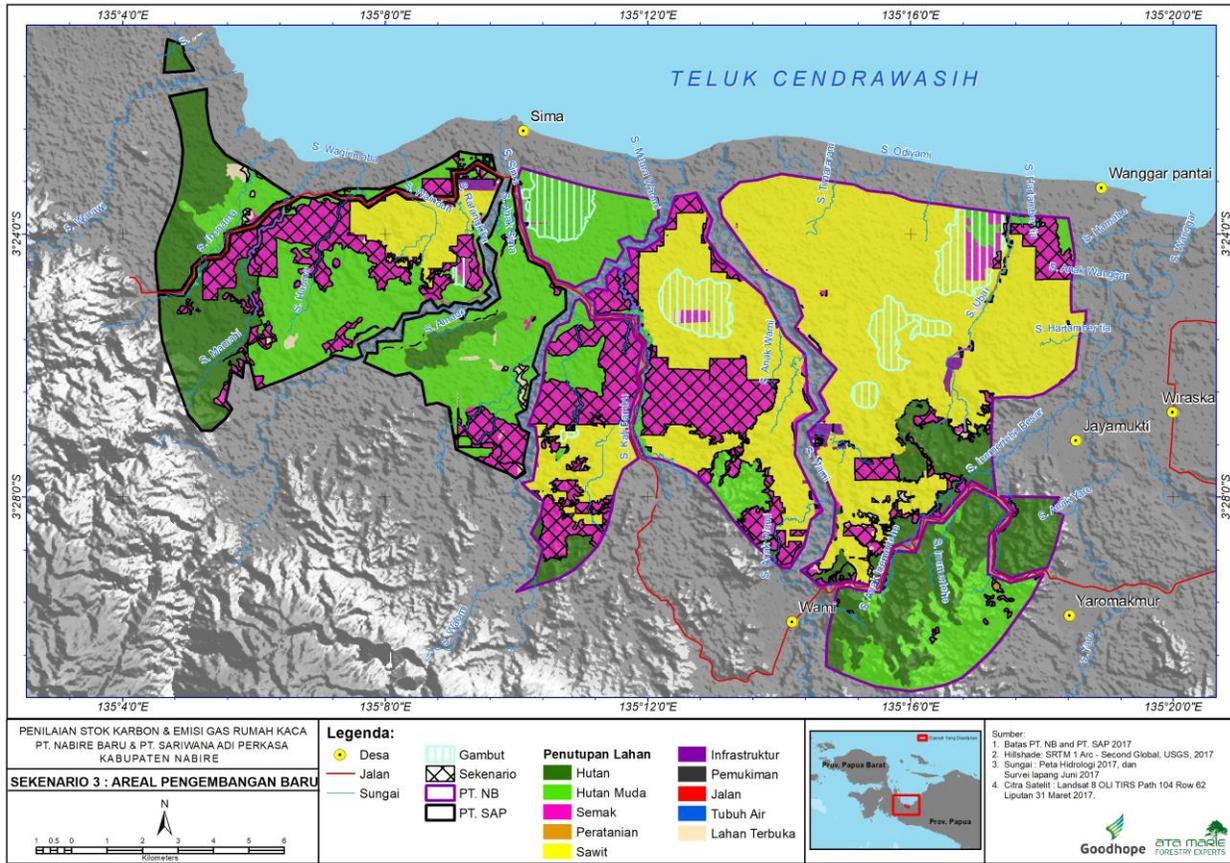


Figure 4. Land Cover and Peatland Distribution in PT NB and PT SAP concession areas

1.4. Proposed New Development Areas

The proposed plan for new plantings is intended to support the development of plasma plantations to fulfill existing commitments to the communities of Wanggar and Sima villages for plasma plantation development.

In the PT NB/SAP concessions, there are four Plasma co-operatives each with a stand-alone HGU license granted by the government (Akaba 839 ha; Sarakwari 951 ha; Waoha 1,546 ha and Wate 872 ha). In total the plasma HGU areas cover 4,207 ha, of which 1,314 ha (31%) has been developed for plantations and related infrastructure.

Communities around the concession areas continue to place large hope for future income from plasma plantations and seek completion of plasma plantations. At Sima village, the community requested that apart from sago areas all plasma areas be developed including forested areas. At Wanggar village, the community requested that all plasma areas be developed including forested areas and that any plasma land that needs to be conserved (due to HCV/HCS/peat) should be replaced elsewhere.

Within the existing plasma boundaries, there is insufficient area of plantable land (nonHCV/HCS/peat) to support the development of plasma plantations. Therefore, in order to make up the deficit, the company proposes to provide plasma plantations in land that is currently in the company HGU permit.

In PT NB concession, 2,238 ha of land has been identified for potential new plantings to provide plasma for local communities. The proposed new plantings are planned in accordance with the company's Sustainability Policy and RSPO New Planting Procedures. The proposed development areas are mineral soil, have not been classified as HCV area or HCS forest, and do not directly border protected areas.

Implementation of the planting plan will provide a total 9,253 ha of oil palm in the PT NB concession (6,158 ha inti and 3,095 ha plasma): 4,940 ha will be managed as conservation area (High Carbon Stock / High Conservation Value /peatland).

The proposed new planting plan depicts the maximum plantable area for the development. We indicate the potential land available for planting (2,238 ha) and a timeline for planting plan as required. However, the implementation of the development plans will be further confirmed through a due process to meet all operational and business standard requirements. The new development will be undertaken upon performing a consultative process with local community and other concerned stakeholders..

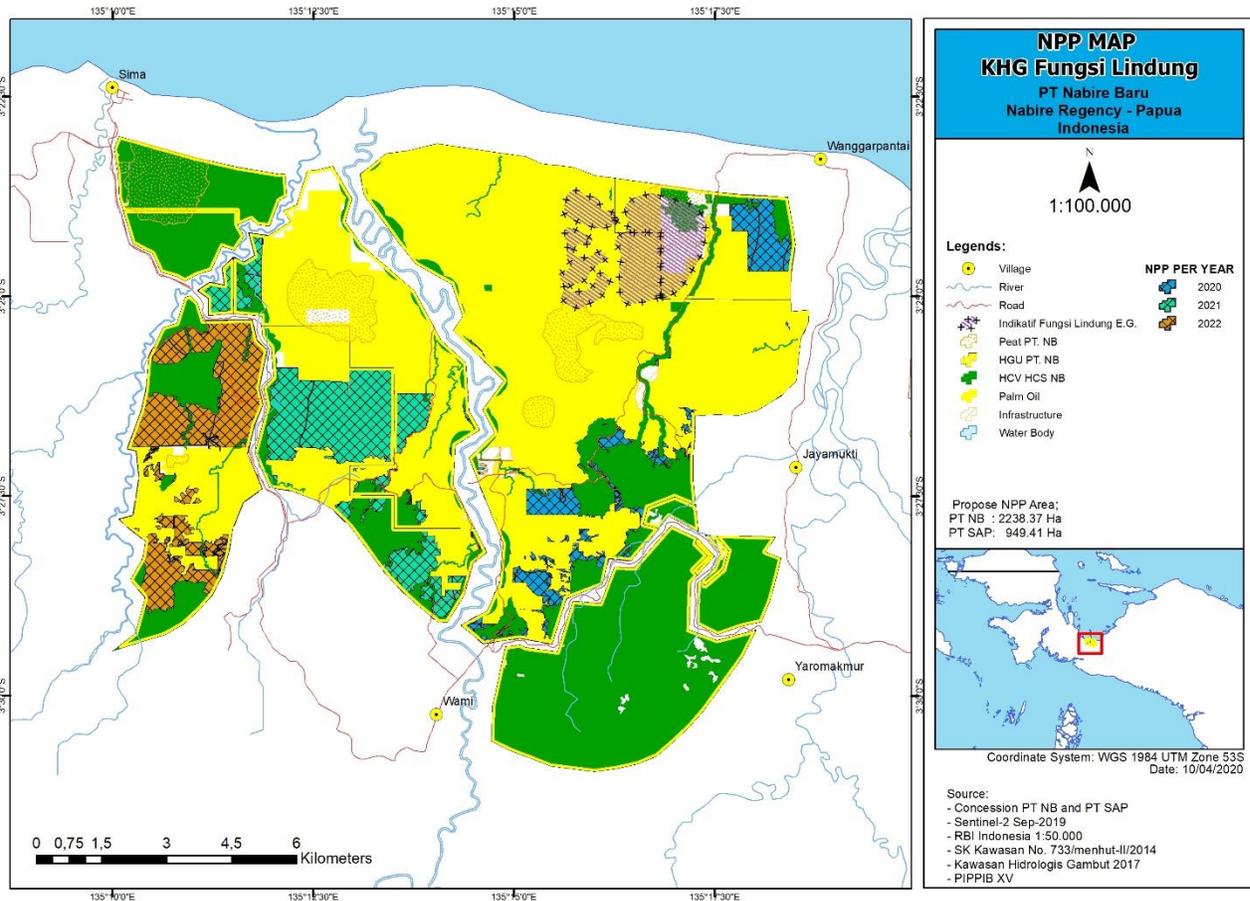


Figure 5. Map of Proposed New Planting by PT NB showing Land Cover and Peat Distribution

Table 4. Proposed New Planting and Conservation Set-Aside

Soil Type	Land Cover	Potential New Planting Area (Ha)	Conservation Set-Aside (Ha)
			HCV/HCS/Peatland
Mineral	Forest	0	2,042.43
	YRF	0	1,938.21
	Scrub	2,179.30	156.45
	Agriculture	0.78	0.18
	Oil Palm	0	252.22
	Infrastructure	0	13.53
	Road	0	4.78
	Settlement	0.03	0.09
	Water Body	0	5.25
	Open Land	58.30	29.04
	Sub Total	2,238.41	4,442.18
Peat	Forest	0	-
	YRF	0	343.20
	Scrub	0	148.35
	Agriculture	0	-
	Oil Palm	0	6.20
	Infrastructure	0	-
	Road	0	0.04
	Settlement	0	-
	Water Body	0	-
	Open Land	0	-
	Sub Total	0	497.79
Total	2,238.41	4,939.97	

Table 5. PT NB Proposed New Planting Plan 2020 – 2022

Year	Planting Plan (Ha)
2020	461.98
2021	974.88
2022	801.51
Total	2,238.37

2 ASSESSMENT PROCESSES AND METHODS

2.1 Social and Environmental Impact Assessment

2.1.1. Dates of SEIA and Assessor Credentials

The EIA (AMDAL) of PT NB was conducted by PT Widya Cipta Buana Consultant and was finalized on 18th December 2013. The team (Table 6) consisted of 16 persons and led by Drs Azis Rahman.

Table 6. The member of EIA (AMDAL) Consultant team with their expertise

Position	Assessor	Qualification
Team Leader	Drs. Azis Rahman	AMDAL A and B
Environmental technique and Water Quality Specialist	Dr. Rudi Laksmono, MS	AMDAL A
	Arie Fitria Indrayana, ST	AMDAL A
Air Quality and Noise Specialist	Drs. Iwan Setiawan	AMDAL A
Biologist	Drs. Bambang Kusharyadi	AMDAL A
	Haikal Suhaidi, Ssi	
	Hendra Mauri, Ssi, MSi	
Soil dan Agriculture Specialist	Ir. Yuswana	
Industrial Technique Specialist	Wawan Dermawan, ST	
Hydrologist, Geologist and Hydro-geologist	Ir. Djajin Prapto Rahardjo	
Planologist	Burhanudin , ST	
Public Health	Indri Aprialini, SKM	
Socio-Economic Specialist	Irba Djaja, SP, Msi	
	Ervan Supriyady	
Anthropologist	Dr. JR Mansoben	
	Yotam Senis	

The first SIA for PT Nabire Baru an completed in February 2011 by a team from the Faculty of Forestry at Bogor Agricultural University (Institut Pertanian Bogor, IPB) led by an RSPO-approved assessor. The update of SIA reports of PT NB was conduct in March 2017 – February 2018 by Ekologika Consulting.

Table 7. Assessment Team for PT NB SIA March 2017 - February 2018

Name	Role	Expertise
Ninil Jannah (Pr)	Assessment Team leader, Social Advisor	EIA, SIA, landscape-livescape analysis, FPIC, participatory survey method, stakeholder engagement, ecosystem service, disaster risk management
Tia Mulyasari (Pr)	Project Manager	Forestry, forest product management, bioenergy, environmental baseline survey, HCS
Iswar Abidin (Lk)	Survey Coordinator, Social Survey Specialist	Policy & Development, SIA, Community Development, Disaster Management, Partisipative Rural Appraisal Specialist
Tri Setyadi (Lk)	Team member, Partisipative Rural Appraisal Specialist	GIS, Forestry management, ecosystem service and biodiversity surveys, Environmental Impact Assessments, High Carbon Stock Assessment, sustainable ladscape based conservation
Sigit Purwanto (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development, community based disaster risk management
Okki Shahibussalam (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development , environmental education, conservation
Priadi Satriotomo (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development
Yanyan Hadiyana (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development , participatory mapping, environmental education
Hadi Dana (Lk)	Team member, Social Survey Specialist	Participatory survey methods, community engagement and development , environmental education
Asep Wahyu Suherman (Lk)	Team member, Participatory Mapping Specialist	Forestry Management, Environmental Services, Forest Inventory, Participatory survey methods

2.1.2. SEIA Methods

2.1.2.1 Review and Analysis of Secondary Data

The Social Impact Assessment uses secondary data to conduct data gap analysis by literature review, and analysis of HCV social survey data / information that can be used for SIA assessment / report.

2.1.2.2 Primary Data Collection

The social impact assessment involves multiple stakeholders that have potential to be affected by activities within the assessment area. The participatory approach enables opportunities for stakeholders with an interest in the intended area to provide input and address issues related to the social impacts identified by the assessment team and inputs for the proposed management and monitoring.

Social impact assessment is conducted using landscape methods, where assessments are conducted in villages within the permit area and around the HGU area. Based on the following criteria: (a) the village within the location permit area, (b) the adjacent village that is very close to the location permit area and

is potentially affected directly or indirectly from the company's operations / social impact management within a location permit, (c) a village located within a location permit area based on a watershed (DAS) / sub-basin and having other natural resource attachment from the HGU area. Based on these criteria, there are 5 (five) target assessment village.

Table 8. Villages in and around PT Nabire Baru

No.	Village	District	Ethnicity
1	Sima	Yaur	Suku Yerisiam
2	Wanggar Pantai	Yaro	Suku Wate, Ayamaru, Buton, Jawa, Flores, Manado
3	Yaro Makmur	Yaro	Suku Dani, Mee, Ikari, Jawa, Toraja, Manado, Flores, Ambon, Bugis, Sunda, Batak
4	Jaya Mukti	Yaro	Suku Dani, Mee, Ikari, Jawa, Toraja, Manado, Flores, Ambon, Bugis, Sunda, Batak
5	Wami	Yaur	Suku Dani, Mee, Ikari, Jawa, Toraja, Manado, Flores, Ambon, Bugis, Sunda, Batak, Madura

Participatory Rapid Rural Assessment (PRRA) was conducted to assess social impacts in rural areas in a participatory manner with communities. The reasons for using this method are: (1) this approach puts the community as a subject who knows the conditions and problems in the region; (2) this approach is more able to provide "space" to the community from various social status and interests to convey aspirations; (3) this approach is also one of the media of learning and empowering the community about the condition and problems in the region.

In the stages of the implementation of the social impact assessment, stakeholder consultations are conducted at the village / village and district level. Stakeholder consultations are a consultative medium aimed at verifying the information gathered in the preparation and planning phases, collecting new information, assessing the validity or credibility of claims, seeking opportunities to reduce conflicts from management decision making and gathering inputs from various stakeholders for management and monitoring.

Some PRRA techniques used for collecting data are Focused Group Discussion (FGD), Semi-structured Interviews, and Observation (ground check) in the field, with the assessor position as "human instrument", triangulating data sources, and with members of the social assessment team on activities HCV assessment.

Table 9. Time Frame of Social Impact Assessment Schedule of SIA

No.	Stage	Location	Period
1	Preparation	Villages around company	Week IV March 2017
2	Field Survey 1: a. Scoping survey and obtaining assessment approval from indigenous community b. Survey- 1 (FGD) c. Survey- 2 (FGD)	Kampung Sima, Wanggar Pantai, Yaro makmur, Jaya Mukti, Wami	June – August 2017
3	Draft Report Social Survey	Jakarta	Sept – Nov 2017
4	Scoping visit and Preparation for Social Impact	Jakarta	January 2018
5	Survey-2 a. Questioner b. Interview and FGD	Kampung Sima, Kampung Sima, Wanggar Pantai, Yaro makmur, Jaya Mukti, Wami dan Kantor Unit Manajemen	January – February 2018
6	Report Writing (Draft)	Nabire	January – February 2018
7	Stakeholder Consultation	Hotel Mahavira 2, Kota Nabire	8 February 2018
8	Report Writing (Final Draft)	Jakarta	February – April 2017

2.2 HCV Assessment

2.2.1. Introduction

High Conservation Value (HCV) is biological, ecological, social or cultural value of outstanding significance or critical importance in local, national, regional or global level. Categories, definitions, and criteria to identify values are established globally by High Conservation Value Resource Network (HCVRN). RSPO voluntary certification standard stipulates HCV management in RSPO Principles and Criteria (2013) 5.2, 7.1, 7.3, and related to 2.2, 2.3, 6.3, and 6.4. “The status of rare, threatened or endangered species and high conservation value habitats, if any, that exist in the plantation or that could be affected by plantation or mill management, shall be identified and their conservation taken into account in management plans and operations.” (Criteria 5.2).

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. The assessment of this HCV uses definitions of HCV categories as per the Common Guidance for the Identification of High Conservation Values from HCVRN (2013), but applies HCV sub-category criteria for HCV identification as per the HCV Identification Guidelines for Indonesia 2009, to provide country-specific context.

The objectives of the HCV assessment are as below:

- 1) Evaluate and determine the existence of HCVs in the assessment area (concession area and its surrounding landscape), and to describe value condition, and potential threats.

- 2) Delineate 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 where HCV attributes are present and focusing on efforts where HCV management area is needed within areas under direct influence of company or management unit, and other management needs.

2.2.2. Dates of HCV Assessment and Assessor Credentials

HCV Assessment at PT NB was completed by Ekologika. Summary information of team members are presented below. The re-assessment survey was conducted on March – October 2017.

Table 10. Assessment team for HCV Assessment

Team Member	Role	Expertise
Field Survey		
Ninil Jannah	Assessment Team Leader, Social Advisor (ALS16004NJ)	EIA, SIA, landscape-livescape analysis, FPIC, participatory survey method, stakeholder engagement, ecosystem service, disaster risk management
Iwan Setiawan	Assessment Alternate Team Leader	Wildlife Researcher and Surveyor, wildlife conservation, ornithologist, community facilitator, participatory mapping. Has been involved in HCV assessments since 2012
Tri Setyadi	Biophysical Survey Leader, Ornithologist	GIS, Forestry management, ecosystem service and biodiversity surveys, Environmental Impact Assessments, High Carbon Stock Assessment, sustainable landscape based conservation
Tia Mulyasari	Biophysical Survey, Ecosystem Service Analysis	Forestry, forest product management, bioenergy, environmental baseline survey, HCS
Sigit Purwanto	Social Survey Leader	Participatory survey methods, community engagement and development, community based disaster risk management
Okki Shahibussalam	Social Survey	Participatory survey methods, community engagement and development , environmental education, conservation
Yanyan Hadiyana	Social Survey	Participatory survey methods, community engagement and development , participatory mapping, environmental education
Hadi Yana	Social Survey	Participatory survey methods, community engagement and development , environmental education
Khrisma Lekitoi	Biophysical Survey, Vegetation Expert	Vegetation Research and Surveys, Ecosystem conservation
Pieter Torobi	Biophysical Survey, Mammals Expert	Mammal surveys and conservation management
Dadi Ardiansyah	Geographical Information System, GIS Analyst	GIS, HCS, conservation management

Team Member	Role	Expertise
Asep Suherman	Social Survey, Geographical Information System	Land Use and Land Cover Survey/Research
Priadi Satriotomo	Social and Biophysical Survey Assistant	Participatory survey methods, community engagement and development
Additional Support		
Alex Thorpe	Overseer, HCS Team Leader	Forest-ecology, sustainable landscape based conservation, HCS, GIS
Neville Kemp	Biophysical and Conservation Advisor	Biodiversity survey, ornithologist, forest-ecology, sustainable landscape based conservation, FPIC, participatory survey methods, community engagement and development.

2.2.3. HCV Assessment Methods

HCV Assessment is classified as rapid-survey with time and cost constraint. PT NB had conducted HCV survey on February 2011 (within permit area) and had conducted review/second HCV assessment on October 2014 (within HGU area). HCV assessment in this case is a re-do assessment – and not to review and update. Therefore, data from previous HCV assessment reports is used only as reference during desktop works and scoping. Following the scoping survey, assessor concluded that the involvement of experts/specialist for vegetation, mammals, bird, ecosystem service is necessary. They will work together in Biophysical Survey Team. Other than that, some social experts will also be involved in Social Survey Team.

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

2.2.3.1 Biophysical Survey (HCV 1, HCV 2, HCV 3, HCV 4)

Survey was conducted using descriptive method with direct observation and survey techniques in areas represent each natural ecosystem type. Ecosystem types identified from land cover analysis and scoping survey are: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains. Transects were conducted in three dominant ecosystem: lowland forest ecosystem, swamp forest ecosystem, and mangrove and estuary ecosystem. Experts team did not conduct quantitative survey within plantation area since RTE species (threatened, endemic and limited distribution) usually are forest species that do not depend on plantation for their survival. However, if HCV species was found, it will be recorded. A rapid inventory of vegetation, mammals and birds were conducted in each ecosystem type for a total of 14 days survey time.

Biodiversity (HCV 1-3)

1) Mammals: Data was collected using Visual Encounter Survey⁶ method (Hayer et al., 1994) combined with a modified Line Transect (one kilometer long). Observation time are 06.30-10.00, 16.00-18.00 and 19.00-22.00 (spotlighting). Mist-netting was not used. VES is advantageous in that the method covers more area (important due to low density of mammals in Papua). In the

other hand, the drawback of this method is the possibility in omitting several species, especially rats and bats.

2) Birds: Data was collected using Line Transect method by Bibby et al. (2000)⁷, for 1 km. 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. Mist-netting was not conducted because it requires more intensive work but produce less data than VES or sound.

3) Vegetation: Rapid vegetation assessment was conducted using a cruising method in transect lines (one kilometer long each), where assessor explore and collect samples from various locations that represent each ecosystem types or vegetation types in assessment area (Rugayah, 2004). The assessment is conducted in conjunction with a HCS forest inventory. Vegetation plot was not conducted because it requires more intensive work and quantitative data was not required to identify HCV species in the landscape.

Ecosystem Services (HCV 4)

1) Land cover ground-check to ensure the accuracy of forest cover data and to verify the existence of springs 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)⁹.

3) Measuring water turbidity as erosion indication using secchi disk at several main rivers and tributaries.

4) Interview with local people to obtain information on lowest and highest water level.

Beside observation, HCV 1-4 data will also be obtained through information gathering using techniques below:

- i) 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 vegetaion, they are more knowledgeable and more experienced.
- ii) Focus Group Discussion (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.

2.2.3.2 Social Survey (HCV 5, HCV 6)

Assessment is conducted in five villages/kampungs within permit area and its surrounding, based on some criteria: villages inside permit area; villages near permit area and potentially affected by or influenced operational activities/HCV management inside permit area, directly and indirectly; villages near permit area, based on watershed/sub-watershed and had some links with natural resource within permit area. Data was collected 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). FGDs in village level was attended by representatives of communities and groups within communities (village officials, religious leaders, sub-tribe representatives, youth group, livelihood groups, and if possible marginal groups). At least 2 – 3 FGDs were conducted in each village. Assessors conducted observation in each village to obtain the overview of community livelihood, in addition to 1 – 2 participatory ground checks (mapping) to obtain spatial information and HCV locations, conditions and management.

Triangulation were achieved through other data/information collection techniques: (1) Key Informant Interview (semi structured interview to village officilas, priest, traditional leaders) and (2) Interviews (relaxed semi structured interview to resource users and owners). Team strived to represent the communities in balance manners: gender based (adult males and adult females), age based (old and young generations), and livelihood based.

2.2.3.3 Geographical Information System

Secondary data used are river network map, vegetation/land cover map, forest area map, 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 were processed with supervised classification method – in accordance to landcover classification from High Carbon Stock Approach Toolkit10. DEM Data (CGIAR-Consortium for Spatial Information/CGIAR-CSI ver.4.0) was analyzed to produce slope and altitude class. Soil map, rainfall map and slope map were used to calculate potential Erosion Hazard Level (TBE, Tingkat Bahaya Erosi).

Primary data (GPS points) were collected to verify SRTM accuracy, as well as landcover analysis based on SPOT6 and Landsat 8 image interpretation. Other data are indications of HCV 1-6 presences within assessment area. To verify the accuracy of topographical conditions described in DEM secondary data, general observation were carried out throughout the landscape within HGU PT NB. Spatial analysis to create delineation of HCV 1-6 was accomplished through overlays and data analysis of ecosystem and biodiversity (HCV 1-3), ecosystem service (HCV 4), basic and cultural needs of local/traditional community (HCV 5-6).

2.2.3.4 Schedule

Table 11. Schedule of assessment activities

No.	Stage	Period
1	Scoping survey and obtaining assessment approval from indigenous community	3 – 7 April 2017
3	Pre-Assessment Stakeholder Consultation (in <i>Kabupaten</i> /Regency level)	8 June 2017
4	Full Survey (Ecosystem service and biodiversity Field survey)	6 – 22 June 2017
5	Full Survey (Social Field Survey)	30 May – 17 June 2017
6	Full Survey (Delineation Ground check HCV location and area management)	30 May – 22 June 2017
7	Full Survey (Social Follow-Up Survey at Sima and Wanggar PantaiTraditional Village)	16 – 27 July 2017

No.	Stage	Period
8	Stakeholder Consultation in Village level (assessment result approval from local/traditional communities)	20 – 25 August 2017
9	Post-Assessment Stakeholder Consultation (Regency level)	30 – 31 August 2017

Table 12. Definitions of HCV Categories/Sub-Categories

HCV Category	Definition	Criteria
HCV1.1	Areas that Contain or Provide Biodiversity Support Function to Protection or Conservation Areas	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.
HCV1.2	Critically endangered species	Critically endangered species (or sub-species) based on IUCN Red List
HCV 1.3	Viable Populations of Endangered, Restricted Range or Protected Species	All CR, EN, VU species as listed on IUCN Red List Restricted range species (endemic species) present in one island or part of it Species protected by Indonesia Law (Law no 5/1990) and listed in PP no 7/1999 Species listed on CITES Appendix I and II
HCV 1.4	Habitat of Temporary Use by Species or Congregations of Species	Certain species that needs a specific habitat in their life cycle, where they congregate, stay, breed, migrate, etc is considered as keystone habitat
HCV 2.1	Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics	Core Area >20,000 ha consists of unfragmented natural habitat
HCV 2.2	Areas that Contain Two or More Contiguous Ecosystems	Area should have two or more continuous representative ecosystem within landscape – with ecotone/ecoline
HCV 2.3	Areas that Contain Representative Populations of Most Naturally Occurring Species	Extensive area with surrogate biodiversity/landscape necessary to support such species.
HCV 3	Rare, threatened, or endangered ecosystems, habitats or refugia.	Threatened: Lose 50% or more of initial area of a biogeographical ecosystem unit. Will lose 75% or more of the initial area, based on the assumption that all HPK/APL area will be converted.

HCV Category	Definition	Criteria
		Rare: natural ecosystem that covers less than 1-5% of biogeographical area.
HCV 4.1	Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	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 provide 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
HCV 4.2	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 watershed sedimentation.
HCV 4.3	Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	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.
HCV 5	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.	Sites or natural resources fundamental for satisfying substansial basic needs of local community, irreplaceable, and managed in traditional and/or sustainable manner by its user/owner/manager.
HCV 6	Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.	<p>Sites, resources, habitat and lanscape with high cultural value, recognized by national policy and legislation Sites, resources, habitat and lanscape established legally from national government and/or international institution such as UNESCO</p> <p>Sites, resources, habitat and lanscape with recognized important historical and cultural value, even if not protected by legislation.</p> <p>Religious or sacred sites, resources, habitat and lanscape (cemetery, or site for traditional rites, which is important to local</p>

HCV Category	Definition	Criteria
		community) Plants or animal with totemic value or used in traditional ceremonies.

2.2.3.5 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 (20 - 25 August 2017) to obtain agreement on the results themselves as well as management and monitoring HCVs – 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 (8 June 2017) and after the assessment (30-31 August 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 District government were also in attendance during the post-assessment stakeholder consultations.

2.2.3.6 Quality Control

Since the first HCV assessments, the HCV Resource Network (HCVRN) has developed the Assessor Licensing Scheme (ALS) as a system to provide assurance of the competence of the professionals undertaking assessments. The ALS was launched on 31st October 2014 to promote more consistent implementation of the HCV approach by providing standardized rules, manuals and templates for completing assessments and by monitoring the performance assessors by evaluating the quality of their assessment reports. The HCVRN ALS thereby provides assurance to prevent failures in HCV assessments.

The HCV Assessment report was subject to the usual review processes to assess quality. The assessment report passed the HCVRN Quality Panel Review process with satisfactory status on the second round of evaluation, verifying that the HCV assessments have been completed in compliance with the rules of the HCVRN ALS and the guidance provided in the ‘HCV Assessment Manual’ and other relevant documents, tools and templates.

2.3 Land Use Change Analysis

2.3.1. Dates of Land Use Change Analysis and Assessor Credentials

Field assessment related to the LUCA was carried out between March and July 2017 by Ata-Marie.

Table 13. Assessment Team for LUCA

Name	Qualification	Position
Alex Thorp	B. For. Sc.	Project Manager
George Kuru	M. For. Sc.	Inventory Data processing

Dadan Setiawan	S. Hut	Senior GIS Engineer
Dadi Ardiansyah	S. Hut	GIS Engineer and Field forester responsible for carbon inventory
Asep Wahyu Suherman	S. Hut	Participatory Land Use Mapping.
Dyah Ayu Putri Pertiwi	S. Hut	GIS Engineer
Krisma Lekitoy	S. Hut	Botanist

2.3.2. LUCA Methods

The methods used in the Land Use Change Analysis study of PT NB include: a) Remote sensing and GIS Analysis; b) Review the secondary data reports and others secondary data utilized (HCV Report, AMDAL report, SIA Report, Soil Analysis report, Peat land Assessment Report); c) Definition of Land cover strata and vegetation coefficient; d) Field Verification; e) Image and Land Cover Stratification Validation; f) Change Detection Analysis.

Table 14. Land covers strata and vegetation coefficient

Land Cover Strata	Description	Vegetation Coefficient
Primary Forest	Forest undisturbed by any human activity including both selective logging (large and small scale) and clearance for gardening. Primary forests in NB/SAP are limited to wet swampy areas unattractive for commercial logging.	1
Secondary Forest	Forest disturbed by selective logging (large and small scale).	0.7
Agroforestry/ Mixed forest and rubber.	Mixed fruit trees, rubber and residual natural forest. This stratum is not found in the study area.	0.4
Agriculture	Agricultural activities. In the study area this is limited to small areas of active smallholder shifting cultivation.	0
Scrub	Land reverting to forest after historical non-corporate land clearing. Simple low canopy and dominated by pioneer species.	0
Scrub (reverting LC)	Land fully or partially cleared by the company but not planted, and now reverting to scrub. Simple low canopy and dominated by pioneer species.	0
Land Clearing in Progress	Land undergoing active clearance by the developer in preparation for establishment of oil palm and related infrastructure. This land cover class is a temporary condition.	0
Oil Palm	Established oil palm areas.	0
Infrastructure & Amenities	Developer's facilities on site: offices, accommodation, workshops, warehouses, nurseries etc. Also includes access roads outside	0
Bare Land	Open land.	0
Water Body	Large rivers and other open water bodies.	0

Table 15. Field Verification Framework

<p>Validating the land cover data</p>	<p>Validation of the land cover was done primarily in conjunction with the HCS inventory. A total of 187 HCS plots were measured.</p> <p>In addition, forest inspection was carried out during participatory mapping of land use and a sago inventory focusing on the Sima Dusun Sago area.</p>
<p>Compiling information related to historical land cover and land use in the study area.</p>	<p>Document Review. Review of a range of documents including company documents related to project development and environmental management. Review of third party data on forest and ecology in the region.</p> <p>Participatory Mapping. Discussions, interviews and field inspections to sites relevant to past and current land use.</p>
<p>Identifying the loss of social HCVs.</p>	<p>Identification of the loss of social HCV's (HCV 4, 5, and 6) was carried out via discussions, interviews and field inspections with relevant Stakeholders, in particular Wanggar and Sima community members.</p>
<p>Identifying the loss of areas where planting is prohibited by RSPO P&C or by country's specific legislation (e.g. riparian zones, steep slope, deep peat).</p>	<p>Spatial analysis. Overlay data from interpretation of satellite imagery with river buffers, slope maps, and soil types.</p> <p>Ground check survey. Field survey to verify findings of initial spatial analysis.</p>

2.4 Carbon Stock Assessment and Estimation of GHG Emissions

2.4.1. Dates of Assessment and Assessor Credentials

Table 16. Assessment Team for GHG Assessment and Carbon stock Assessment

Name	Qualification	Position
Alex Thorp	B. For. Sc.	Project Manager
George Kuru	M. For. Sc.	Inventory Data processing
Dadan Setiawan	S. Hut	Senior GIS Engineer
Dadi Ardiansyah	S. Hut	GIS Engineer and Field forester responsible for carbon inventory
Asep Wahyu Suherman	S. Hut	Participatory Land Use Mapping.
Dyah Ayu Putri Pertiwi	S. Hut	GIS Engineer
Krisma Lekitoi	S. Hut	Botanist

2.4.2. GHG Assessment and Carbon Stock Assessment Methods

GHG Assessment report was conducted according to RSPO GHG Assessment Procedure for New Development version 3, October 2016 and incorporated carbon stock assessment based on the The HCS Approach Toolkit Version 2.0: Putting No Deforestation into Practice, 3 May 2017. The assessment followed the process of HCS Forest Patch Analysis Decision Tree described in the 2017 toolkit. The carbon stock map serves as a guide to estimate projected emission from land use change and development.

Inventory Plots

Each plot consists of two concentric circular plots with areas of 0.05 and 0.01 hectares respectively. **Figure 6** shows the layout of a single HCS plot. Small diameter trees (<15cm DBH) are measured only in the sub plot. Trees with DBH \geq 15cm are measured throughout the whole plot.

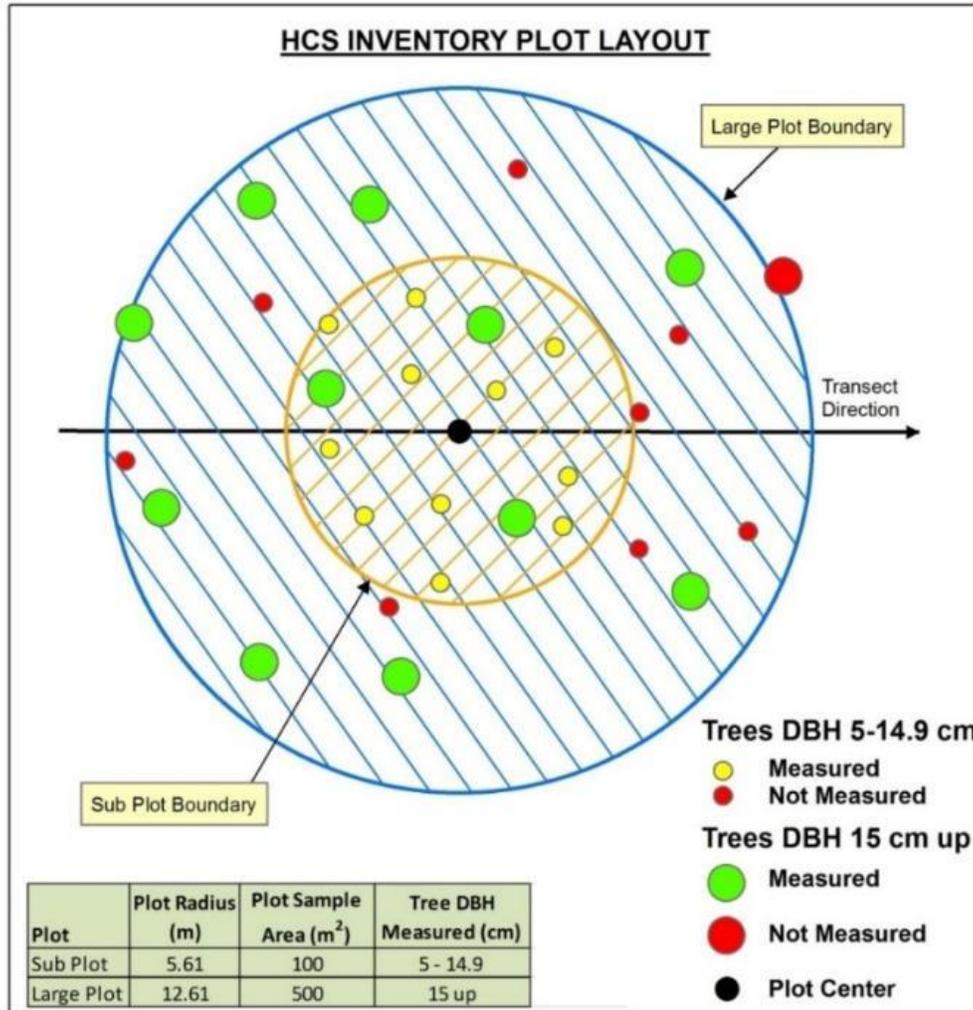


Figure 6. HCS Inventory Plot Layout

For each inventory plot measured, the following information is collected:

- GPS waypoint
- Plot photographs (set of 5)
- Land cover strata (as assessed by team leader)
- Canopy cover code
- Description of plot site and general surroundings
- Description of topography, soil and underfoot conditions
- Description of any evidence of human activity

For each tree measured, the following data is collected:

- Species
- Diameter
- Total tree height

Carbon Calculation

Standard methods for carbon calculation are used to estimate total biomass and carbon mass per plot, strata averages of total biomass and carbon mass per ha, as well as strata averages distributed by diameter class.

Stems per hectare is calculated from the plot size. The equation used is:
Stems per hectare = (Count of trees in the plot) / (Plot size in hectares)

Tree biomass was estimated for the living trees with DBH larger or equal to 5 cm using the Allometric Equations method. The following equation for wet tropical forests (Chave, et. al. 2005) was applied. This widely used equation relates DBH, total tree height and species-specific wood density (ρ) to estimate Above Ground Live Biomass (AGLB) per tree measured in the forest plots. The resulting AGLB is the total biomass of the stem, crown, and leaves for trees in kilograms.

$$\text{AGLBi} = 0.0776[\rho \text{ D}^2 \text{ H}]^{0.940}$$

Where: AGLB = Above ground live biomass in kilograms
D = Diameter at breast height (1.3m above ground) in centimetres
H = Total tree height in metres
 ρ = Specific gravity in grams per cubic centimetre

Palm Biomass

The equation used for estimating palm biomass was:

$$\text{Palm Biomass}^1 \text{ (tonne)} = [\text{Specific gravity}] * \text{D}^2 / 40000 * (\text{palm height})$$

For palms, specific gravity is assumed to be 0.247 tonne per green m³.

Tree and Palm Carbon Content

The C fraction of biomass is calculated in tonnes of C (Mg C). The equation used for estimating Tree and Palm Carbon Content was:

$$\text{Carbon Mass (tonne)} = \text{Biomass} * (\text{Carbon conversion factor})$$

The carbon conversion factor estimates the carbon component of the vegetation biomass. This can be derived for specific forest types or the IPCC standard value of 0.47 can be used. In this case the IPCC standard value has been used.

Carbon Mass per Hectare

The equation for estimating tree carbon mass per hectare in each plot is:

$$\text{Total Carbon (tonne/ha)} = \Sigma ([\text{Tree Carbon}]) / [\text{Plot size in hectares}]$$

Separate calculations of volume are made for estimating tree volume in sub-plots because the plot size differs between the main and subplot.

¹ The palm equation uses the geometric equation for a cylinder multiplied by the specific gravity. No specific equations are available in the scientific literature and so this simple equation has been used.

Analysis of Carbon Estimate Precision and Significant Difference between Strata

Carbon Estimate Precision

The target precision level for carbon stock estimates is 90% confidence intervals within 10% of the average total carbon stock per ha in each strata for the designated above ground carbon pools. 90% confidence intervals (CI) were calculated for each land cover strata from the calculated carbon per ha in each plot using the following standard formula:

$$CI = t_{\alpha/2} \cdot s/\sqrt{n}$$

Where: t is the Student's t value,
 α determines the level of confidence
s is the standard deviation of the sample and n is the sample size.

Table 17. GHG Emission Source and Sequestration

Source			Remarks
Emission Source	1	Land Conversion	CO ₂ emissions from land conversion
	2	Fertilizing	N ₂ O and CO ₂ emissions from the use of mineral fertilizers and organic materials in the field and their transportation
	3	Fuel Consumption	Emissions from the use of fuel
	4	Peat Oxidation	N ₂ O and CO ₂ emissions resulting from cultivation on peat soil
Sequestration Source	5	Oil Palm Sequestration	Absorption of oil palm (crop sequestration). Absorption of carbon dioxide (CO ₂) remains by oil palm trees, ground cover and carbon sequestration in plantation litter.
	6	Conservation area Sequestration	Absorption (CO ₂) in conservation areas. Carbon dioxide is determined by the amount of biomass in the conservation area.

Notes: The Source of the emission below is not calculated, because when the GHG calculation conducted, NB and SAP not yet developed Palm Oil Mill. (Fuel of Palm Oil Mill; CH₄ from POME; and Credit Emission for excess Energy transferred)

2.5 Soil and Topography Assessment

2.5.1. Dates of Soil and Topography Assessment and Assessor Credentials

This semi-detailed soil survey and soil management groups and sub-groups assessment for oil palm plantation was carried out by Carmiel Agrotech Sdn. Bhd. in collaboration with Param Agricultural Soil Survey (M) Sdn. Bhd in March 2017. A second survey was carried out by Ekologika and Ata Marie as part of HCV Assessment.

2.5.2. Soil and Topography Assessment Methods

The survey as part of HCV assessment used the methods of purposive sampling methods, where the sampling unit take based on "Assessment" Location that indicative as peat refer to secondary data/document: Land system Map; Soil map of PT NB and PT SAP; Land Cover Map; and Digital Elevation

Map.

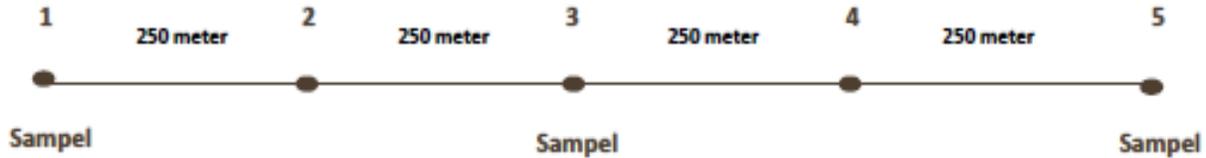


Figure 7. Soil Sampling: 1 per 250m (5 samples along 1000m)

2.6. Community Engagement and FPIC Processes

Free Prior and Informed Consent (PADIATAPA / FPIC) is the right of the right holders of land to grant or deny their consent to any activities / projects that have the potential to impact on their land, livelihoods and environment. The FPIC Principles have been set out in the UN Declaration on the rights of indigenous peoples as well as the national constitution, and have also been regulated in the context of specific uses for the benefit of oil palm plantations, using the RSPO standard.

Goodhope appointed a third party consultant, LINKS to review the implementation of FPIC processes. The integrated assessment considered compliance against both RSPO FPIC Guidelines (2008) and IFC's Performance Standards related to FPIC, in particular the following five processes:

1. Community participation through the involvement of community representatives (stakeholder engagement).
2. Delivery of information to the community concerned the existence and operation of Goodhope plantations in the Nabire area.
3. Negotiation and land acquisition processes.
4. Implementation of adequate social and environmental impact assessments, including sufficient transfer of knowledge to local communities.
5. Procedures for resolving complaints and conflicts.

The analysis included field visit and comprised document review, in-depth interviews, and participatory focus group discussions to assess compliance with FPIC processes and to develop recommendations for improvement.

In 2017 Ata Marie and Ekologika continued the process of community engagement and participatory mapping to seek community informed consent to the final draft boundaries of conservation areas. FGDs were held at each village between 20-25 August between the HCV/HCS teams and Communities. The objective was to present and discuss the findings of the HCV, HCS, and participatory mapping surveys carried out during the initial site visit. Large scale maps of the draft land use plan were displayed, and Community members invited to check and add comments as desired during the discussions. Addition input was also received during the two-day final stakeholder consultation meeting held on 30-31 August in Nabire.

Table 18. Description of Community Engagement Activities

	Activities	Material / Data
1 st	Meeting with (1) Desa leader - formal (Kepala Desa/Kampung), (2) cultural leader – non-formal (Kepala Suku, Ondoafi, etc.)	<p>Introduction and explanation on team scope of work.</p> <p>Description on survey's activities (HCS and HCV)</p> <p>Consent on survey activities from Desa leader/adat leader and/or community; in the name of community.</p> <p>Information on technical support needed from community leaders and local community.</p>
2 nd	FGD-1	<p>Confirmation of village history.</p> <p>Sketch of village and community land use system.</p> <p>Community land tenure system identification, land management and land owner identification (owners, managers, users).</p>
3 rd	Ground check-1: Participatory Mapping – Community Land Use System	<p>GPS survey – capture of area (polygon/point) taking and land use types and variation.</p> <p>Community representative acknowledged the interest area's border.</p>
4 th	FGD-2	<p>Confirmation of results of Participatory Mapping (tentative map).</p> <p>Stakeholder analysis and social mapping (wealth ranking) – including confirmation of sub suku and clan boundaries.</p> <p>Identification of resources/objects/sites is important for community basic needs (livelihood) and culture – HCV 5 dan HCV 6.</p> <p>ecology history - recording (1) on sudden or gradual major changes to livelihood due to company operational activities, and other economy entity; (2) access, control, and availability status of HCV 5 and 6 (picture on existence/availability and tendency).</p>
5 th	FGD-3 (FGD FPIC)	Delineation of KBKT HCV 5 and 6, HCV threats identification.

Table 19. Community Engagement Activity Schedule

Stage	Activities	Survey Team	Timeline
Scoping Visit	Scoping survey on biodiversity and social aspects; local community agreement	HCS Assessment Team (Ata-Marie)	3-7 April 2017
1 st Stakeholder Consultation Workshop (in Pre-Survei Stages)	Stakeholder consultation on the results of the environmental survey, information gap, HCV Potential, and HCV Assessment Methodology	All Assessor Team	8 June 2017
Sima Village Social Survey	Meeting with the head of Sima village for authorization to conduct activities	Social Survey Team	1 June 2017
	Meeting with the head of Sima village for coordination of GD1	Social Survey Team	8 June 2017
	FGD 1 Sima village on Community land use and tenure study	Social Survey Team	9 June 2017
	<i>Ground check</i> 1 Sima village: Rujahi, Ruija, Kolam Ubamamoi, Goa Nenggomana dan Goa Nenggoina	Social Survey Team	10 June 2017
	Sima village interviews: fishermen	Social Survey Team	11 June 2017
	Sima village interviews: women	Social Survey Team	12 June 2017
	Sima village interviews: Tokoh masyarakat Kampung Sima	Social Survey Team	13 June 2017
	Interviews CSR and HUMAS Managers	Social Survey Team	13 June 2017
	Sima village interviews: Warga dan Sekretaris Kepala Suku	Social Survey Team	14 June 2017
	Sima village community interviews	Social Survey Team	15 June 2017
	FGD ethnographic study	Social Survey Team	16 June 2017
	FGD 2 Sima village on the identification of HCV 5, 6 and planning for ground checks	Social Survey Team	19 July 2017
	<i>Ground check</i> 2 Sima village: Sago and fishing locations	Social Survey Team	23 July 2017
	FGD 3 Sima village: Presentation of the results of ground checks in sago groves and fishing locations, and grievance mapping	Social Survey Team	25 July 2017
<i>Ground check</i> Dusun Sagu	Social Survey Team	26 July 2017	
Kampung Wanggar Pantai Social Survey	Meeting with the head of Wanggar Pantai village for authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Wanggar Pantai village on community land-use and tenure studies	Social Survey Team	2 June 2017
	<i>Ground check</i> 1 Wanggar Pantai village: Dusun sagu, sungai dan	Social Survey Team	3 June 2017

Stage	Activities	Survey Team	Timeline
	rawa dan tataguna lahan		
	FGD 2 Wanggar Pantai village: Social mapping / stakeholder analysis and Ground Check Confirmation	Social Survey Team	4 June 2017
	FGD 3 Wanggar Pantai village: Participatory mapping, Ecological history, Identification of HCVs 5 and 6	Social Survey Team	5 Juni 2017
	<i>Ground check</i> 2 Wanggar Pantai village for identification of HCVs 5 and 6	Social Survey Team	6 June 2017
	FGD 4 Wanggar Pantai village	Social Survey Team	7 June 2017
	Interviews Wanggar Pantai village: livelihoods, HCV 5 and grievance mapping	Social Survey Team	20 July 2017
	<i>Ground check</i> 3 Wanggar Pantai village	Social Survey Team	23 July 2017
Wami Social Survey	Meeting with head of Wami village or authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Wami village: Pemetaan sejarah kampung, Sketsa kampung/desa dan Sistem Tata guna lahan masyarakat, Analisis Pemangku Kepentingan, Peta sosial (wealth ranking)	Social Survey Team	3 June 17
	FGD 2 Wami village: Identification of HCV 5 and 6	Social Survey Team	10 June 2017
	<i>Ground check</i> Wami village	Social Survey Team	14 June 2017
Jaya Mukti Social Survey	Meeting with head of Jaya Mukti village for authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Jaya Mukti village: Pemetaan sejarah kampung, Sketsa kampung/desa dan Sistem Tata guna lahan masyarakat, Analisis Pemangku Kepentingan, Peta sosial (wealth ranking)	Social Survey Team	7 June 2017
	FGD 2 Kampung Jaya Mukti: Identification of HCV 5 and 6	Social Survey Team	12 June 2017
	<i>Ground check</i> Jaya Mukti village	Social Survey Team	13 June 2017
	<i>Ground check</i> Jaya Mukti village	Social Survey Team	15 June 2017
Yaro Makmur Social Survey	Meeting with head of Yaro Makmuri village for authorization of survey activities	Social Survey Team	1 June 2017
	FGD 1 Yaro Makmur village: Pemetaan sejarah kampung, Sketsa kampung/desa dan Sistem Tata guna lahan masyarakat, Analisis	Social Survey Team	3 June 2017

Stage	Activities	Survey Team	Timeline
	Pemangku Kepentingan, Peta sosial (wealth ranking)		
	FGD 2 Yaro Makmur village on the Identification of HCVs 5 and 6	Social Survey Team	6 June 2017
	<i>Ground check</i> Yaro Makmur village	Social Survey Team	12 June 17
Ecological Survey	Observations of species, interviews	Ecology and HCS Assessor Team	1-21 June 2017
Environmental Services Survey	Observations on rivers, hills and forest cover	Ecosystem Services Team	9-21 June 2017
Villages Public Consultation	Penetapan Identifikasi NKT 5 dan NKT 6, Penyampaian Identifikasi NKT 1-4, ancaman NKT, dan rekomendasi pengelolaan NKT 1-6 – FPIC pengelolaan NKT	Team-1: Sima	22 June 2017
		Team-2: Wami	22 August 2017
		Team-2: Yaro Makmur	23 August 2017
		Team-1: Wanggar Pantai	23 August 2017
		Team-2: Jaya Mukti	24 August 2017
Consultation with Management Unit NB and SAP	Consultation on HCV Identification 1-6, HCV threats, and HCV management recommendations	All Assessor Team	28 August 2017
2 nd Stakeholder Consultation Workshop Post Survey (Result of HCV Assessment)	Stakeholder consultation on HCV Identification 1-6, HCV threats and HCV management recommendations (Plenary and Group Discussion)	All Assessor Team	30-31 August 2017

3. SUMMARY OF FINDINGS

3.1. SEIA Findings and Results

3.1.1 Outputs

Outputs from the assessment are:

- Identification of operational activities that provide potential impacts
- Potential indications of impacts (both positive and negative) on socio-economic aspects of regional / sub-national and national scale
- Identification of potential positive impacts / impacts direct and indirect to the local community (including indigenous peoples)
- Identification of potential direct and indirect negative impacts / impacts on local communities (including indigenous peoples)
- Identification of potential positive and negative impacts / impacts (both direct and indirect) with regard to emergent communities (workers, suppliers, etc.)
- Identification of social issues that have the potential to become social risks
- Recommendations for managing positive social impacts and mitigating negative social impacts
- Recommendations for monitoring positive / negative social impacts
- List of legal documents, permits based on applicable regulations and ownership deeds relating to the area assessed
- Document including interview and meeting notes (FGD)
- Other evidence that the assessment has been carried out with the participation of affected parties including representatives of women's groups, youth, and vulnerable and minority groups
- Stakeholder consultation with affected stakeholders and stakeholders other interests (authority and interest stakeholders)
- Data Documentation and Social Impact Assessment Tool (can be reviewed and updated).

3.1.2 Potential Changes in General Condition

i. Changes in human capital

Changes in human capital have occurred and can occur in the health, education and employment sectors of the affected population. In the health sector, there are potential health problems due to several plantation business activities such as mobilization of operational vehicles, diseases caused by mosquito vectors and also health problems due to climate change in the surrounding area. Poor management of environmental impacts can affect the quality of public health. This creates high vulnerability to the community if it is not mitigated and addressed, both by the community and the plantation management unit. With the existence of plasma products, it is also expected that the community can access better health services. But on the other hand changes in the pattern of consumption of the community after receiving plasma products can also influence the emergence of types of diseases that can disrupt public health.

Changes in the education sector have begun to appear with an increase in the quality of the education process, especially basic education with the help of teacher support, scholarship assistance and others from the plantation management unit. Another change that can occur is an increase in the number of people who can access higher education facilities in the presence of plasma. But the excessive

consumption pattern of plasma products can also influence the desire to go to school, especially if it is not supported by good parenting from the parents and the environment.

The work skills of the affected communities especially those involved in the business process of oil palm plantations as workers can increase with the training and guidance efforts of the management unit. But on the other hand, dependence on plasma products can also reduce people's interest in working.

ii. Changes to natural capital

Changes to natural capital that have or have the potential to occur as a result of plantation business processes include indicators such as the quality of water sources, availability of local food, household fuel and also the availability of game animals. Community water sources which generally still depend on the availability of drinking water from the surrounding environment, especially community wells, can be disrupted both in quantity and quality. Reduced discharge and quality of community water can cause health problems and can also result in increased public expenditure if you have to buy water from traveling vendors.

The culture of the people who still produce their own food they consume can change with PT Nabire Baru's oil palm plantation activities both directly and indirectly. Decreased land for farming and destruction of river / sea ecosystems, as well as reduced community hunting areas are examples of potential impacts that can cause disruption of local food availability.

Another change in natural capital that can occur is the pattern of household fuel use. People who generally still use fuel wood for cooking needs can find it difficult to get firewood or are forced to switch to other fuels such as kerosene stoves, which have implications for additional household costs and potential scarcity of kerosene availability.

The above changes (especially those that require costs) if they are not balanced with an increase in household income, for example from plasma yields can lead to new conditions of poverty.

iii. Changes to physical capital / infrastructure

Changes in infrastructure capital (physical) as a social impact of plantation activities include the ease of mobility with the opening of new plantation roads and other supporting infrastructure. Another change that can occur is the potential for increased community motor vehicle ownership both motorbikes and cars. The perception of the public who will get a relatively large share of plasma profits can encourage consumption patterns, including for purchasing vehicles.

In addition, improving the welfare of the community (KPMA members) who obtain plasma products encourages the fulfillment of other infrastructure needs such as electricity connections and telecommunications access. The high demand for these two infrastructures can encourage the investment of provider companies and can also increase the use of household appliances that require electricity connections and communication devices (cellular phones).

iv. Changes to Financial capital

Changes in financial capital can be in the form of changes in the main source of income for the community, especially KPMA members who get plasma profit sharing every month. The relatively large income from plasma can indirectly lead to changes in the consumption pattern of the community, which can stimulate other economic activities such as trading activities in the market and also local shops.

Community perceptions (KPMA members) about the relatively large distribution of plasma products are considered to be able to meet community needs and do not require other jobs (sources of income). This can lead to the public's potential for laziness to work again. If there is a discrepancy between the perception of the community (which is based on the management unit's promise of the results of the plasma that has been socialized) with the reality when the distribution of plasma products can lead to the potential for prolonged conflict with the plantation.

v. Changes to Social capital

Changes in social capital as a result of the business process of oil palm plantations include the potential for higher conflicts, as well as affecting the social cohesiveness of the community. Conflicts that can occur can be between communities, or between communities and plantation management units. Horizontal conflicts between communities can be caused by, for example, the management of KPMA that is not transparent and accountable, there is mutual distrust between the people who are pro and contra with the company and also between workers and non-workers.

Changes in other social capital are also influenced by changes in the demographics of the local population. The large number of labor of plantation companies brought in from outside can lead to a variety of customs and cultures and also the potential for cultural acculturation. In addition, changes in the demographic structure of the population can also influence local cultural practices that are still centered on tribal leaders.

3.1.3 Positive Impacts

The good change that has been felt by the community so far is the existence of assistance from PT Nabire Baru to customary institutions as well as religious facilities, especially churches in the local area.

Positive impacts that must be managed by the management unit are as follows:

- Potential additional household income from the distribution of plasma yields
- Potential additional household income by engaging as a plantation service provider / contractor
- Potential additional household income by engaging as plantation employees
- Potential additional household income from leasing land to immigrants
- Potential increase in economic activities of the community
- Increased public access road
- Increased public knowledge about agriculture and plantation cultivation
- Increased knowledge and ability of cooperative management

3.1.4 Negative Impacts

From interviews and discussions with specific group of communities, several issues have been raised. Based on the results of the analysis of community vulnerability to business processes / company presence, the negative impacts that must be a priority (important impact) of the management unit to be managed are negative impacts which are high risk to the community; as follows:

- Potential reduced access to production from customary lands such as sago, hunting, timber, rattan, etc. due to land clearing
- Potential for conflict due to differences in the value of compensation received by each community member / KPMA.

- Increasing the number of people suffering from mosquito-borne diseases as disease vectors due to land clearing
- Source of clean water decreases due to land clearing
- Potential loss of nutrient sources due to reduced hunting location
- Potential loss of types of local food sources due to land clearing activities
- Reduced community sago inventory due to land clearing errors
- Potential conflicts between KPMA management and members and between KPMA (community) members and companies due to limited understanding of KPMA members on business processes, including operational costs that are borne by cooperatives and plasma profit sharing.
- KPMA management does not work well
- Potential for river water pollution that can reduce river water quality and disruption of aquatic life due to the use of fertilizers and pesticides in the nursery process
- Potential landslides due to land erosion in the process of planting oil palm in hilly areas
- Potential decline in productivity of oil palm plants due to massive pest attacks due to planting of homogeneous (oil palm) plant species
- Potential emergence of health problems due to increased dust content due to mobilization of plantation operational vehicles during planting process
- Potential disruption of community mobility due to road damage due to mobilization plantation operational vehicles during the planting process
- Potential for river water pollution which can reduce river water quality and disruption of aquatic life due to the use of fertilizers and pesticides in the maintenance process.
- Potential reduction in water discharge that can disrupt community water supply due to water use in the maintenance process
- Potential health problems during maintenance activities due to the use of chemical fertilizers and maintenance pesticides
- Potential health problems due to increased dust content due to mobilization of plantation operational vehicles in the maintenance process
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the maintenance process
- Potential conflicts between indigenous people and migrant workers arise during the maintenance process.
- Potential occurrence of health problems due to increased dust and noise due to mobilization of plantation operational vehicles in the harvesting process
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the harvesting process
- Potential conflicts between indigenous communities and migrant workers in the process construction of palm oil mills
- Potential health problems due to increased dust and noise due to mobilization of plantation operational vehicles in the process of building palm oil mills
- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the process of building palm oil mills
- Potential the emergence of health problems due to air pollution and noise because of the palm oil mill machinery activities in the palm oil processing
- Potential emergence of health problems due to pollution disturbance from oil palm machinery activities in palm oil processing
- Potential health problems due to increased dust and noise content due to plantation operational vehicle mobilization in oil palm processing

- Potential disruption of community mobility due to road damage due to mobilization of plantation operational vehicles in the processing oil palm
- Potential potential conflicts between indigenous people and migrant workers in the oil palm processing process
- Potential reduction in income of KPMA members due to reduced plasma area due to reduction in areas that support HCV and HCS
- Reduced potential for food sources due to legal sanctions for illegal activities for hunting protected species

3.1.5 Development Priorities

1. Improving the quality of basic services

The quality of affected communities, especially the education and health sectors, is the main priority of development. The health and education sector and other basic services are sectors that are included in the obligatory government affairs which are the responsibility of the regional government. Improving the quality of basic services that target the strengthening of human capital is expected to be the capital of the community to get alternative choices to improve the quality of life of the community and also alleviate poverty.

2. Strengthening Basic Infrastructure

Strengthening basic infrastructure is needed as a support system for the livelihoods of affected people. Strengthening road infrastructure, telecommunications and electricity connections is expected to increase access and mobility of people to livelihood choices.

3. Food Security

Changes in the pattern of people's livelihoods from consuming food products produced by themselves into food obtained from outside (by buying) have the potential for food insecurity, especially if not supported by good purchasing power. Maintaining and increasing local food production can help people's food security.

4. Strengthening village government administrative services

Strengthening village administration administration services through strengthening the capacity of village officials and better administrative systems is expected to increase community cohesiveness. In addition, strengthening data collection and compiling village profiles can be the baseline for regional development in villages affected by PT Nabire Baru's business processes.

5. Management of Disaster Risk

The high risk of disasters in the villages affected by the PT Nabire Baru business process requires a risk management plan as well as disaster preparedness. The long history of disaster events, especially the types of floods, coastal abrasion and earthquakes must be a priority for disaster risk management and preparedness. The creation of a flood early warning system and also a village evacuation plan as well as strengthening the ability to handle emergencies by local communities are priorities for disaster preparedness.

6. Law enforcement

The high potential for conflict that can occur as a result of several activities in the PT Nabire Baru plantation business process requires the handling of clever conflict resolution. Settlement

of conflicts with law enforcement, both customary law and formal law must be put forward. Apart from that, the high threat of security from other parties also still needs security support without any attempt to intimidate the public.

7. Multi-stakeholder collaboration in landscape management

The large size of the landscape and the variety of actors involved in the business process of oil palm plantations require multi-stakeholder coordination and cooperation to support the interests of each party and also to reduce the potential for wider impacts including conflicts between parties.

8. Strengthening cultural, traditional and religious practices

Cultural practices, customs and religious activities can support the strengthening of the cohesiveness of affected communities. Strengthening cultural and customary practices based on existing tribal structures has a very important influence on PT Nabire Baru's business continuity. The company's partnership with customary rights holders based on a communal management system (based on tribes and sub-tribes) needs to ensure the existence of existing cultural and customary practices. In addition, cultural, customary and religious practices can be a media for resolving conflicts between customary rights owners and plantation managers.

9. Fostering community organizations

Community organizations as social capital of the affected villages generally do not have a significant role in supporting community livelihoods. The complexity and dynamism of problems in the community and the focus of community development on traditional and religious institutions need to be supported by other community organizations that focus more on each issue, such as community business organizations (cooperatives), women's organizations, youth organizations, and so on.

3.2. LUCA Findings and Results

The LUCA study included: a) Remote sensing and GIS Analysis; b) Review the secondary data reports and others secondary data utilized (HCV Report, AMDAL report, SIA Report, Soil Analysis report, Peat land Assessment Report); c) Definition of Land cover strata and vegetation coefficient; d) Field Verification; e) Image and Land Cover Stratification Validation; f) Change Detection Analysis.

Validation of the land cover was done primarily in conjunction with the HCS inventory. A total of 187 HCS plots were measured. In addition, forest inspection was carried out during participatory mapping of land use and a sago inventory focusing on the Sima Dusun Sago area.

Information related to historical land cover and land use in the study area was compiled by:

- i. Review of a range of documents including company documents related to project development and environmental management.
- ii. Review of third party data on forest and ecology in the region.
- iii. Participatory Mapping, discussions, interviews and field inspections to sites relevant to past and current land use.

LANDSAT 8 imagery was used to determine changes of vegetation since November 2005 and combine with SPOT 6/7 imagery for 2016 data. Spatial analysis from satellite imagery overlaid with river buffers,

slope maps, and soil types was verified by ground surveys on the field to check the findings of initial spatial analysis.

Additional LUCA was conducted for period of October 2017 to October 2019 to see land cover gap between the end of main LUCA Assessment NPP (Oct 2017) and current proposed NPP process (Oct 2019). This additional analyze also conducted by Ata Marie to prevent ambiguity in data processing.

Table 20. Satellite imagery utilised for each time of clearance period

Period		Acquisition Date	Description of Satellite Images Used	Resolution	Cloud cover
1	Pre - Nov 1, 2005	June 2005	Landsat ETM+ 7Path/Row 104/62	30 m	0
2	Nov 1, 2005 - Nov 31, 2007	Nov 2007	Landsat TM 5, ETM+ 7 Path/Row 104/62	30 m	0
3	Dec 1, 2007 - Dec 31, 2009	April 2009	Landsat TM 5 Path/Row 104/62	30 m	0
4	Jan 1 2010 - Feb 28, 2011	Feb 2011	Landsat ETM+ 7 Path/Row 104/62	30 m	0
5	Mar 1, 2010 - May 8, 2013	May 2013	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	0
6	May 2013 to May 9, 2014	August 2014	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	1%
7	May 9, 2014 - Dec 2014	Dec 2014	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	0
8	Dec 2014 – Nov 2016	April 2016 June, Oct & Dec 2016	SPOT6/7 Landsat 8 OLI TIRS, Path/Row 104/62 (Main/supporting)	2.5m 30 m	0
9	Nov 2016 – Mar 2017	March 2017	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	0
10	Mar 2017 – Okt 2017	Sept 2017	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	9%
11	Okt 2017 – Okt 2019	Sept 2019	Landsat 8 OLI TIRS, Path/Row 104/62	30 m	1%

Table 21. Land Cover at Each Measurement Date 2005-2019

Land Cover Class	Nov-05	Oct-07	Dec-09	Feb-11	May-13	May-14	Dec-14	Nov-16	Mar-17	Oct-17	Oct-19
Primary Forest	2,019	2,019	2,019	2,019	334	334	334	0	0	0	0
Secondary Forest	12,108	12,108	12,088	12,087	8931	6771	5779	4316	4306	4306	4197
Agriculture	0	0	0	0	0	0	0	4	7	7	7
Scrub	457	480	500	501	398	326	184	85	85	85	167
Scrub (Reverting LC)	0	0	0	0	197	1525	899	2838	2627	2627	2687
Bare Land	22	0	0	0	30	4	0	0	0	0	29
LCIP	0	0	0	0	3009	1260	1561	14	150	150	11
Oil Palm	0	0	0	0	1709	4313	5770	7260	7341	7341	7341
Infrastructure & Amenities	0	0	0	0	0	74	81	91	92	92	167
Water Body	1	1	1	1	1	1	1	1	1	1	1
Total	14,609										

(Source: LUCA Report of PT NB by Ata Marie, December 2017 *additional Oct 2019)

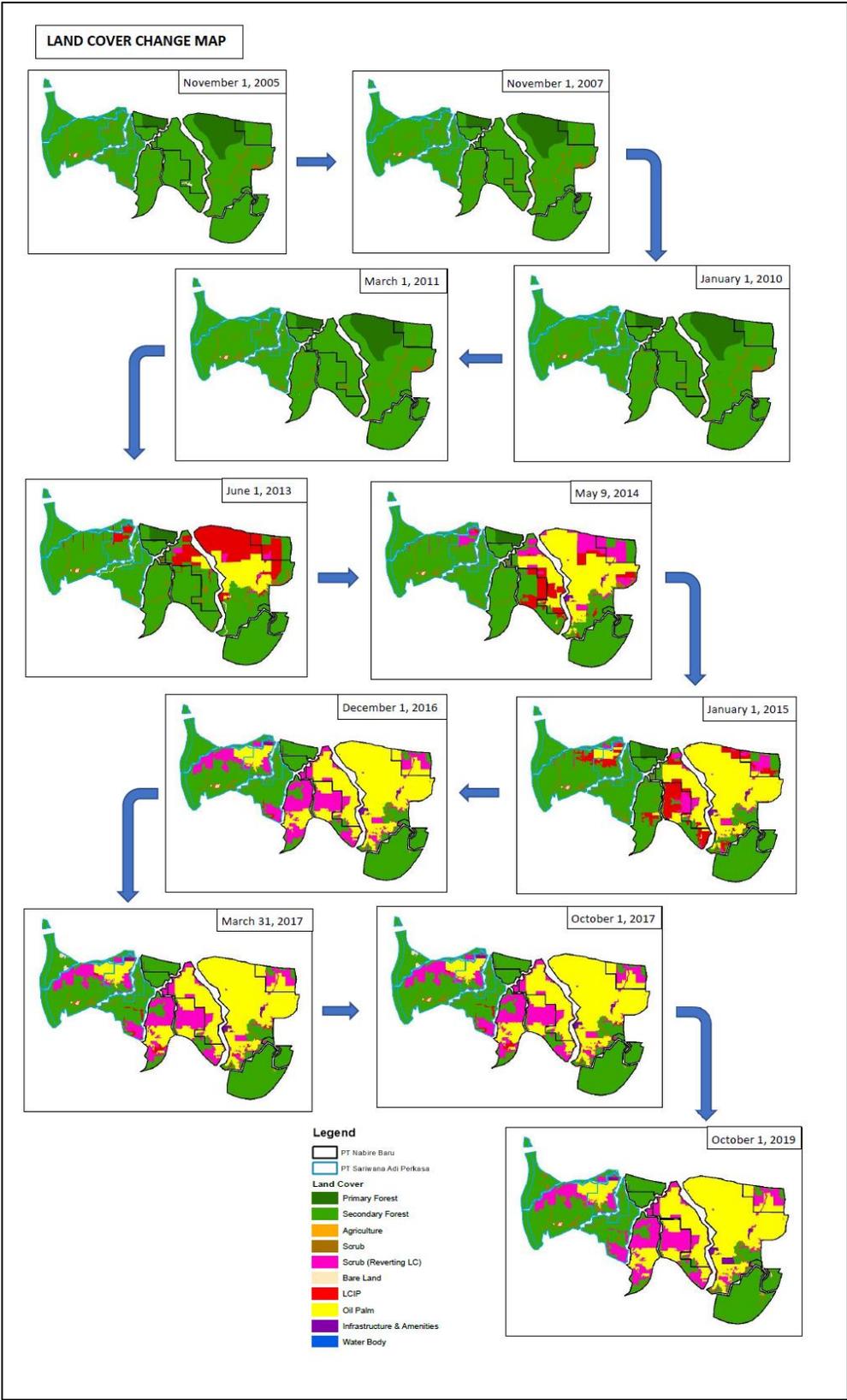


Figure 8. Process of Land Use Change Maps

3.3. HCV Assessment Findings

3.3.1 National and/or Regional Context

The landscape is part of the Papua Bird's-Head and Aru Islands Lowland Forest that stretches from Papua Bird's-Head to the east and south to Aru Islands. In general, compared to other ecoregion in Indo-Malay area, this ecoregion has low-medium level of biodiversity and endemism. However, reptile and amphibian diversity, although currently unknown, are probably important.

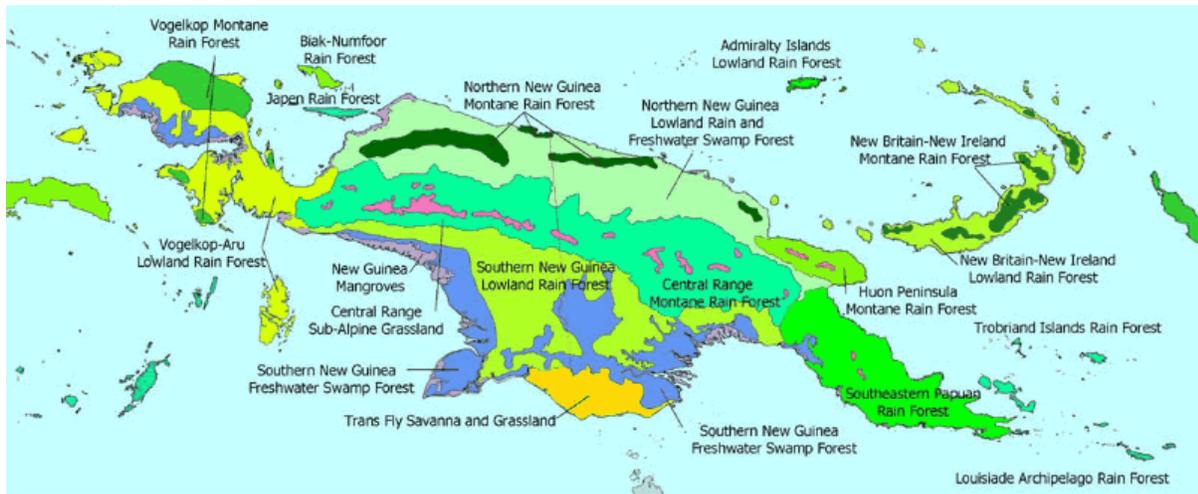


Figure 9. WWF Ecoregion. Areas of similar species, most were based on plant diversity and dominant habitat (sumber: www.wwf.org)

Forty seven (47) mammal species can be found in the ecoregion, including 8 endemic species. Mammals in this area classified as Australasian marsupials, including critically endangered tree kangaroo (*Dendrolagus sp.*) and echidna (*Zaglossus bruijini*), as well as vulnerable Wallaby (*Thylogale bruinji*) and New Guinea Quoll (*Dasyurus albopunctatus*). This ecoregion boasts 366 bird species; most of them are Australasian family, such as Ptilonorhynchidae, Eopsaltridae, Meliphagidae, and Paradisaeidae.

The ecoregion is also known as West Papua Endemic Bird Area. It has 19 restricted range species and 8 endemic species (Wikramanayake *dkk.*, 2000). However, it should be noted that the Endemic Bird Area (EBA) also covers West Papua islands and swamp area in south Papua. Furthermore, there are no endemic or almost endemic bird species within PT NB assessment landscape.

In 2000, approximately 90% of this ecoregion was considered as undisturbed natural ecosystem. However the percentage of primary/natural ecosystem has since decreased drastically. Conservation area covered 5,410 km² (7%) of ecoregion. Wide scale threats in regional context included illegal logging, infrastructure development and large-scale plantations.

Based on national landuse regulation, HCV assessment landscape consists of Permanent Production Forest (*Hutan Produksi Tetap*, HP), Protected Forest (*Hutan Lindung*, HL), Non-Forest (*Area Penggunaan Lain*, APL), Limited Production Forest (*Hutan Produksi Terbatas*, HPT), Convertible Production Forest

(*Hutan Produksi Konversi*, HPK), and Marine Nature Reserve Area² (*Kawasan Suaka Alam Laut*, KSAL). Based on Papua Province Spatial and Regional Planning (*Rencana Tata Ruang dan Wilayah*, RTRW), the area is classified as settlement area (from Nabire city to the east area of Wanggar River) and cultivation area (areas adjacent to Wanggar River) for plantations. According to Papua Province RTRW³, production forest areas (HP, HPT and HPK) were included in cultivation area, while protected forest areas and marine reserve were established as protected area.

Province and regional spatial policies in this area provide growth opportunities for forestry and non-forestry (including plantations) business without ignoring protection or conservation interests by maintaining protected forest and marine reserve inside the area proportionally. Conflicting interest might occur between cultivation and conservation. HCV assessment and management will open discussion spaces in how sustainable development in the area put economic, environment and social interests in equal stance.

3.3.2 Landscape Context

HCV Assessment Landscape (Area) is focused at PT NB's HGU area and its adjacent areas. PT NB assessment area is adjacent to PT Sariwarna Adi Perkasa's HGU in the west. Both HGUs are situated in one single landscape. HCV values should be evaluated in landscape context. Landscape boundaries were determined by biophysical conditions (including rivers) and continuous forest cover from focus area to its surrounding, without ignoring relevant social conditions.

Table 22. Boundaries of PT SAP and PT NB HCV Assessment Landscape

	Boundary	Notes
North	Cendrawasih Bay	Along the coast, from Wanggar River estuary in the east to small estuary on the west of Warawi River.
East	Wanggar River Body	Territory boundaries of Wate Tribe customary right in Kampung Wanggar Pantai
West	Warawi River sub-watershed	Warawi River sub-watershed is situated in the east of Wasoi river
South	Up to plains (in MoRAP modelling)	Areas with plans landreform in the south side, in addition to several areas with hills landreform along Waomi River sub-watershed

These biophysical boundaries overlapped with customary right territory of Yeresiam Gwa Tribe and Wate Tribe. The areas were bounded by Wasoi River in the west and Ayaare River in the east. North boundary was along the coast from Ajaare River estuary in the east to Wasoi River estuary in the west. In the southeast, the area is adjacent to Erega Village near Yamor Lake, and in the southwest to Ororodo Village. Wate Tribes on Wanggar Pantai owned the land from Ajaare River in the west to Wanggar River in the east. The land stretched to the south up to mountain area near Warega Village. Specifically, SAP's HGU area was situated inside the territory of Yeresiam Gwa Tribe (Yerisiam). This tribe consists of four sub-tribes: Waoha, Akaba, Sarakwari and Koroba.

² Based on Minister of Forestry Decree No. SK.782/Menhut-II/2012 on The Amendment of Minister of Forestry and Plantation Decree No 891/KPTS-II/1999 on The Establishment of Forest Area in Irian Jaya Province in area +/- 42.224.840 Ha

³ Papua Province Regional Decree (Peraturan Daerah, Perda) No 23/2013 on RTRW Provinsi Papua Tahun 2013-2033.

PT NB assessment area is located in Yaur District and Yaro District, Nabire Regency, Papua Province. Yaur District is the westernmost district in Nabire Regency, and adjacent to Teluk Wondama Regency, Papua Barat Province. PT NB assessment area is adjacent to the area of Wanggar Pantai Village, Yaro Makmur Village and Jaya Mukti Village – all in Yaro District. In Yaur District, assessment area is adjacent to Wami Village and Sima Village.

In general, villages near PT NB area can be classified into two: Village with customary right (hak ulayat) – Wanggar Pantai Village and Sima Village; and Transmigrant Village – Wami Village, Yaro Makmur Village and Jaya Mukti Village. Sima Village belongs to a Papuan indigenous tribe, Yerisiam Gwa Tribe, which consists of four sub-Tribes (Waoha, Sarakwari, Akaba and Koroba). Wanggar Pantai Village belongs to other indigenous tribe, Wate Tribe.

Village with customary rights – Both villages are located in coastal area. The villagers depend on natural resources in their village, especially from the sea and rivers. Common livelihoods in Wanggar Pantai are from fishing and farming, while Sima Village is fishing, planting and timber harvesting. Livelihood patterns in both village are not affected by the seasons.

Transmigrant Village – Wami, Jaya Mukti and Yaro Makmur Villages were established at 1996 through national transmigration program. The settlers came from various region of Indonesia and from Papua itself. Each transmigrant was granted two plot of lands to support their livelihood. One plot commonly used for housing, cultivation land, and cattle, while the second plot currently is still in forest state. The livelihood in these villages is dominated by farming, working on plantations or forest sector, traders, labor and government officials. Common crops are combination of non-rice food crops and vegetables, while the preferred livestock is cattle.

Domination of Nabire indigenous tribes is more visible at Wanggar Pantai Village and Sima Village. On the other hand, in transmigrant villages, although other Papua indigenous tribes such as Dani, Ikari and Mee tribes are dominant, ethnicity in transmigrant villages is more varied.

Table 23. PT NB HCV Social Survey - Villages

No.	Village Name	Area (km ²)	District	Population	House hold	Tribe/Ethnicity
1.	Sima	422.22	Yaur	308	67	Yerisiam Gwa Tribe(Sarakwari, Akaba, Koroba, Waoha Sub-Tribes)
2.	Wami	20.78	Yaur	376	78	Javanese, Sundanese, Bugis, Madura, Toraja, Manado, Batak, Ambon, Flores; Papua native tribes (Dani and Mee tribe)
3.	Wanggar Pantai	318.33	Yaro	455	125	Papua native tribes : Wate Tribe (Families: Monei, Hao, Nanaur, Raiki, Wai, Warai, Hei); Buton, Javanese
4.	Yaro Makmur	266.60	Yaro	1,109	289	Javanese, Sundanese, Bugis, Toraja, Batak, Ambon, Flores; Papua native tribes (Dani and Mee tribe)
5.	Jaya Mukti	102.51	Yaro	839	130	Javanese, Sundanese, Bugis, Toraja, Batak, Ambon, Flores; Papua native tribes (Dani and Mee tribe)

Local communities utilize sago by harvest them. Currently, in Wanggar Pantai and Sima Village, there are still local people, especially elderly people, that harvest sago in local sago groves. Some of the harvest

are then sold and the rest are for their own consumption. Sago is served during traditional ceremonies that still practiced in Sima Village, such as wedding ceremony, death ceremony, peace gathering, and hair cutting. Aside as food staple, sago is also considered as traditional identify of Yerisiam tribe. Kampung Sagu, an area where sago is cultivated, symbolize “mother that provide food”.

Similar to other native kampungs in Papua, Sima Village has a traditional institution consists of Chieftain and Customary Council (Dewan Adat), regulated through Local Regulations on Special Otonomy for Papua (Peraturan Daerah Otonomi Khusus, Perdasus). Traditional institution plays an important role in strengthening, straightening and providing justification for the ownership of customary lands, as well as enforcing and resolving violations against customary rules or values.

Other formal institution in the village is Village Government, lead by Kepala Kampung (Head of Village). Kepala Kampung is aided by village secretary and other staffs. Kepala Kampung, as well as Camat, plays a greater role in the control and regulations of land and natural resources.

Communities around PT NB in general are Papuan indigenous tribe that practicing Protestantism (Christian Protestant). Moslems commonly are transmigrants from Java, Buton, Bugis and Mandar. There are also Hindus, usually Balinese transmigrants. Although registered as Christian, Sima villagers still hold faith to their sacred sites, preserving and practicing traditional rituals.

Yerisiam Tribe adhered to specific rituals before entering sacred sites, such as Goa Nenggoina, Goa Nenggomana, Ruija and Rujahi. Bat hunting in Goa Nenggoina and Goa Nenggomana is only part of origin stories for the two sacred sites. Currently, no one knows when and who was the last person brave enough to enter the caves. The hunting itself was not acknowledged by Yerisiam Gwa tribe as an important part of their cultural tradition, although some people consume bats.

The Assessment landscape is adjacent to forest area of Teluk Cendrawasih Marine National Park in the north and Sima Protected Forest in the west. Teluk Cendrawasih Marine National Park is considered very important since it has a high level of endemic and threatened biodiversity, such as Whale Shark (*Rhincodon typus*), Green Sea Turtle (*Chelonia mydas*), Hawksbill Sea Turtle (*Eretmochelys imbricata*), Leatherback Sea Turtle (*Dermochelys coriacea*), Olive Ridley Sea Turtle (*Lepidochelys olivacea*), Dugong (*Dugong-dugong*), Ocean Sunfish (*Mola-mola*), Giant Clam (*Tridacna gigas*), as well as more than 1000 fish and 500 coral reef species. The park traditional utilization zone is adjacent to PT NB assessment area.

National Peat Ecosystem Function Map shows the presence of a Peat Hydrological Unit, ie. Wanggar River-Bumi River PHU (KHG 91.04.04), with total 7,289 ha, consists of 2,092 ha conservation function and 5,198 ha cultivation function. However, assessor also found that the area is classified as Non-forest/APL and conversion production forest/HPK, as well as settlements, such as Karadiri Village, Wanggar Village, Wanggarmakmur Village, Wirasta Village, Wanggarsari Village, Bumimulya Village, Kalisemen Village, Waroki Village, etc.

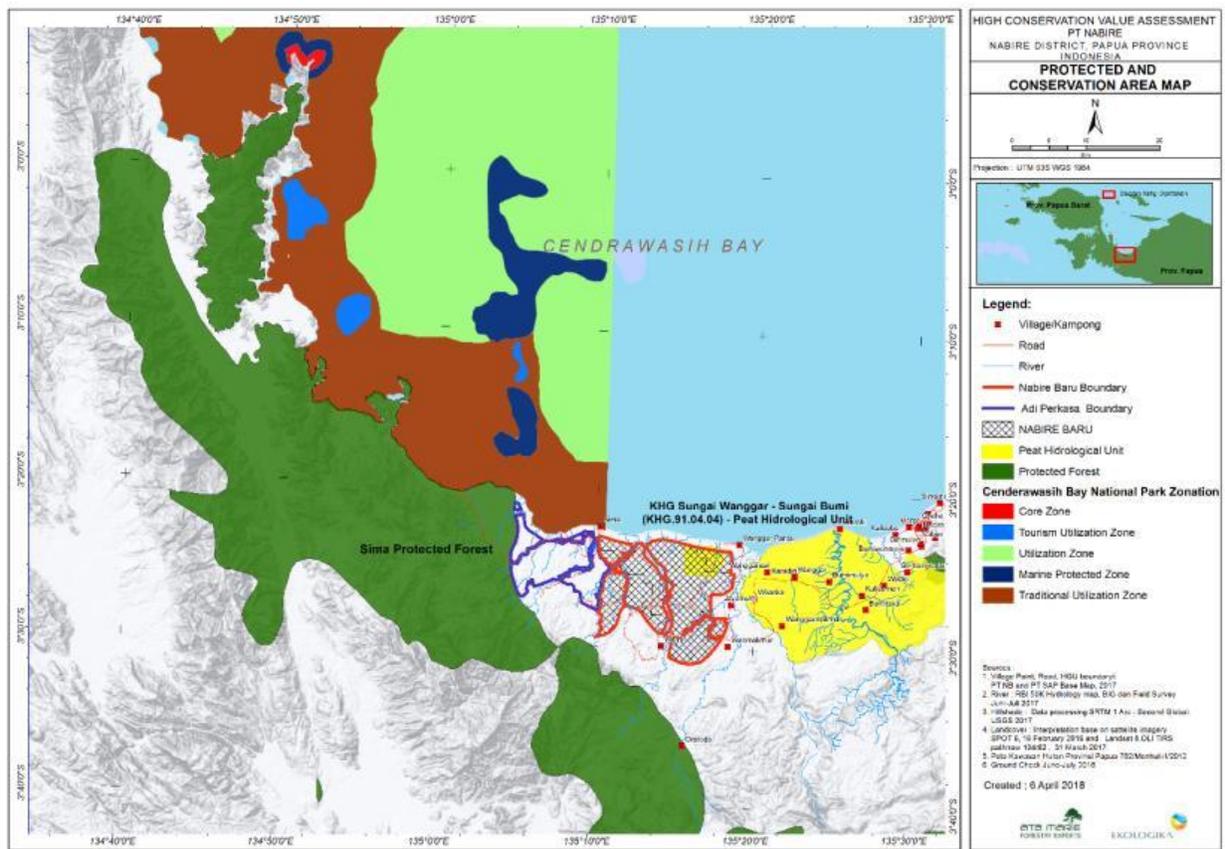


Figure 10. Conservation and Protection Area

PT NB landscape area consists of one large landscape which contains several ecosystem types, namely: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Lowland swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains.

Table 24. Ecosystem Types in Assessment Landscape

No	Ecosystem Type	Description
1	Lowland Forest on Plains	Secondary lowland forest on plains is dominated by Resak (<i>Vatica rassak</i> – Dipterocarpaceae), Matoa (<i>Pometia pinnata</i> – Sapindaceae), Kenanga (<i>Cananga odorata</i> (Lam.) Hook. f. & Thomson – Anonaceae). Macaranga sp (<i>Euphorbiace</i>) can be found easily, as this species is considered a pioneer species that signified forest clearing or harvesting. This ecosystem is the dominant ecosystem type in assessment area, extends from south to the north up to the coast.
2	Lowland Forest on Hills	Vegetation composition of this ecosystem type is indistinguishable to lowland forest on plains. This type can be found at the southern part of assessment area.
3	Mountainous Lowland Forest	Vegetation composition of this ecosystem type is indistinguishable to lowland forest on plains. This type can be found at the southern part of assessment area.

No	Ecosystem Type	Description
4	Lowland Swamp Forest	<p>This type has lower and more open canopy (up to 15 m), as well as lower species diversity, and dominated by <i>Terminalia spp</i> and <i>Camposperma sp</i>. Lower canopy is interspersed by tall sago palm (up to 15 m). The understory layer is filled by flood-resistant species. Common species are Pandan (<i>Pandanus spp</i>), <i>Phyllodendron spp</i>, herbs <i>Donax canniformis</i> and several Aroid species (<i>Cyrtosperma sp</i>. dan <i>Alocasia spp</i>).The forest is inundated all year long. The soil consists of peat and fine alluvial, with thick organic matters in the surface. This ecosystem type can only be found at several locations: near Sima Village (between Anak Sima River and Waomi River), south of Sima Village between Sima River and Anak Waomi River, around Amado River and Wagimaba River, and from west of Wanggar Pantai Village to Sima Village.</p>
5	Mangroves and Estuarine	<p>Estuarine is a transitional marine area (ecotone) between freshwater habitat and saltwater habitat. Estuarine is heavily affected by tides, location characteristics and its sloped morphology. Mangrove consists of vegetation on alluvial mud soil in coastal area and rivermouth affected by ocean tides. In this area, the mangrove is dominated by <i>Avicennia sp</i> and <i>Sonneratia sp</i>. Some spots of nipa palm can also be found more inland. This ecosystem type can be found in the coastal area Wanggar River.</p>
6	Lowland Grassland on Plains	<p>This ecosystem can be found on the southwest of Sima Village, as the location of Ruija sacred site. Located on a small flat expanse, this area is dominated by <i>Imperata spp</i>, <i>Saccharum spp</i>, and <i>Dicranopteris spp</i> on the edges adjacent to lowland forest. According to locals, this area is always a grassland and never been a forest. This ecosystem type is also heavily</p>

3.3.3 HCV Results and Justification

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.

Table 25. Summary of HCV Identification in PT NB.

HCV Definition	HCV Sub-category	HCV Sub-category Description	HCV Identification Result
<p>HCV 1 – Species Diversity</p> <p>Concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species that are significant at global, regional or national levels.</p>	1.1	Areas that Contain or Provide Biodiversity Support Function to Protected or Conservation Areas	Potentially Present – Indicative Wanggar River – Bumi River Peat Hydrological Unit (KHG, <i>Kawasan Hidrologi Gambut</i>) and River Buffer
	1.2	Critically Endangered Species	Potentially Present – Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>).
	1.3	Viable Populations of Endangered, Restricted Range or Protected Species	Present – 6 Vegetation species, 4 Mammals and 30 Bird species.
	1.4	Habitat of Temporary Use by Species or Congregations of Species	Not Present – Species or species groups that need temporary habitat are not found
<p>HCV 2 – landscape-level ecosystems and ecosystem mosaics, Undisturbed Forest Landscape</p> <p>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.</p>	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.
	2.2	Areas that Contain Two or More Contiguous Ecosystems	Present – Ecotone between lowland swamp forest and lowland forest
	2.3	Areas that Contain Representative Populations of Most Naturally Occurring Species	Present – Representation of natural species is shown from the presence of cassowary, species of Accipitridae family, species of Ducula genus, lorries and cockatoo, Kangaroo, hornbill and bird-of-paradise
<p>HCV 3 – Ecosystem and Habitat Rare, threatened, or endangered ecosystems, habitats or refugia.</p>	3		Present – Mountainous Lowland Forest, Mangroves and Estuarine, Lowland Grassland on Plains and Water bodies/lakes (lowland)
<p>HCV 4 – Ecosystem Services Basic ecosystem services in critical situations including</p>	4.1	Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for	Present – All water bodies and water banks, mangrove and estuarine

HCV Definition	HCV Sub-category	HCV Sub-category Description	HCV Identification Result
protection of water catchments and control of erosion of vulnerable soils and slopes.		Downstream Communities	ecosystem, swamp forest ecosystem
	4.2	Areas Important for the Prevention of Erosion and Sedimentation	Present – Hilly area with Erosion Hazard Level value > 180 ton/ha/year
	4.3	Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Present – Lowland forest, swamp forest, Wami River, Wanggar River, Yaro River and their waterbanks
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 – Area and natural resources fundamental for fulfilling basic needs, irreplaceable and traditionally/ sustainably managed by local people are present. Included are: Sources of carbohydrate, protein, vitamin, direct income, potable water for drinking and cooking, clean water for sanitation, craft materials, subsistent land, fuel, traditional medicine, building materials (timber and non-timber), fodder.
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 Sites with important social culture values for local people (including indigenous people) Sacred sites: Goa Nenggoina, Goa Nenggomana, Ruija, Rujahi, Parigi Hamuku, old Village Hamuku, Sungai Busuk (Rarantiruma), Air Mabuk, Anapireonggre (in Yaur language)/ Babrauguapi (in Yerisiam language), Bahoom Wau, Hamatre (Aha Juha), Ubaina, Makam Tanung, Goa Wamora Important sites for local culture: Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi Species with cultural importance: Bird-of-paradise,

HCV Definition	HCV Sub-category	HCV Sub-category Description	HCV Identification Result
			Sago (<i>Metroxylon sagu</i>)

3.3.3.1. Explanation of HCV 1 Identification – Species Diversity

Sub HCV 1.1 – Potentially 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.

In Indonesia, protected area and forest conservation system consists of conservation area and protection area. Protection area plays an important role in biodiversity conservation. Management activities within concession area should be able to ensure of to improve the preservation of support function of the area, and to reduce or to prevent operational impacts against biodiversity support functions.

In PT NB assessment landscape and its surrounding, there are one conservation area and two protection areas, namely: Teluk Cendrawasih Marine National Park, Sima Protected Forest and Wanggar River-Bumi River Peat Hydrological Area. Sima Protected Forest is in the west area, adjacent to SAP's HGU (other Goodhope subsidiary in the west of PT NB), and in the south side of PT NB (approx 1 km from HGU boundary). Since Teluk Cendrawasih MNP is a marine ecosystem, forest ecosystem and biota within PT NB do not support its biodiversity directly (for example, as buffer zone). Management activities that might disturb the presence of biodiversity is sedimentation, as the result of infrastructure and plantation construction. This matter is important and shall be included in HCV 4.1. The river protected Area (river buffer) is potential HCVA 1.1.

Indicated Wanggar River-Bumi River Peat Hydrological Area (KHG.91.04.04) is inside HGU PT NB, but current land cover for KHG is oil palm plantation, and therefore no longer support biodiversity. However, several area are still forest, which have potential in supporting biodiversity. KHG is still indicative, which means its status should be verified in the field in accordance to chapter 5 to 8 Government Regulation no 71/2014 on Peat Ecosystem Protection and Management. Up to now, Wanggar River-Bumi River KHG is still unverified by the authorities, therefore, total area, location and zonation might be amended in the future.

Peat mapping and measurement conducted during HCV assessment showed that only a fraction of Wanggar River – Bumi River KHG area located inside PT NB HGU is peat. Therefore, Wanggar River – Bumi River KHG areas inside HGU with intact peat are considered indicative KHG for peat protection function.

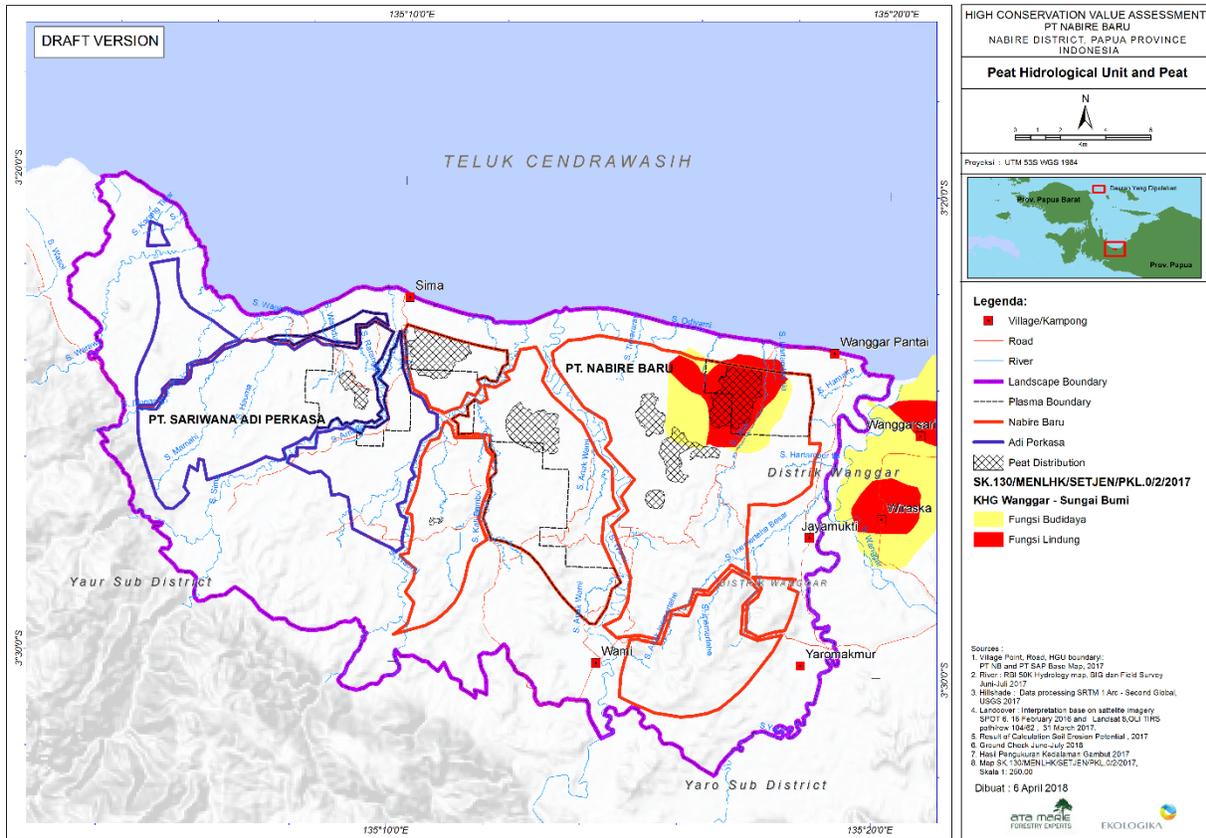


Figure 11. Peat Distribution Map

Some of the area is covered by swamp forest ecosystem type with excellent biodiversity. Mammals encountered during survey are: Sugar glider (*Petaurus breviceps*), Southern Common Cuscus (*Phalanger intercastellanus*) and Echymipera Long-nosed (*Echymipera rufescens*). Total bird species found was 42 species from 22 families. Highest represented species was from Columbidae family, with 6 species, which indicated that their habitat is still in good condition. Although no bird species classified as CR, EN or VU based on IUCN Redlist, twenty one (21) bird species are included in Appendix I or II CITES and protected by Indonesian Law. Two species are endemic species.

Indicative Wanggar River – Bumi River Peat Hydrological Unit (KHG, Kawasan Hidrologi Gambut) and River Buffer inside HGU PT NB are considered as potential HCVA 1.1

Table 26. List of Appendix I or II CITES Species in PT NB

No	Common Name	Scientific Name	Familia	CITES	PP	Endemic
1	Grey Goshawk	<i>Accipiter novaehollandiae</i>	Accipitridae	II	P	
2	Doria's Goshawk	<i>Megatriorchis doriae</i>	Accipitridae		P	
3	Pacific Baza	<i>Aviceda subcristata</i>	Accipitridae	II	P	
4	Brahminy Kite	<i>Haliastur indus</i>	Accipitridae	II	P	
5	Rufous-bellied Kookaburra	<i>Dacelo gaudichaud</i>	Alcedinidae		P	
6	Red-breasted Paradise-kingfisher	<i>Tanysiptera nympha</i>	Alcedinidae		P	E

7	Papuan Hornbill	Rhyticeros plicatus	Bucerotidae	II	P	
8	Sulphur-crested Cockatoo	Cacatua galerita	Cacatuidae		P	
9	Palm Cockatoo	Probosciger aterrimus	Cacatuidae	I		
10	Brush Cuckoo	Cacomantis variolus	Cuculidae	II		
11	Olive-crowned Flowerpecker	Dicaeum pectorale	Dicaeidae			E
12	Red-flanked Lorikeet	Charmosyna flaccida	Loriidae	II		
13	Coconut Lorikeet	Trichoglossus haematodus	Loriidae	II		
14	Black-capped Lory	Lorius lory	Loriidae	II		
15	Olive-backed Sunbird	Philemon buceroides	Meliphagidae		P	
16	Helmeted Friarbird	Cinnyris jugularis	Nectariniidae		P	
17	Black sunbird	Leptocoma aspasia	Nectariniidae		P	
18	Lesser Bird-of-paradise	Paradisaea minor	Paradisaeidae	II		
19	Twelve-wired Bird-of-paradise	Seleucidis melanoleucus	Paradisaeidae		P	
20	Eclectus Parrot Yellow-capped Pygmy	Eclectus rotatus	Psittacidae	II		
21	Yellow-capped Pygmy	Micropsitta keiensis	Psittacidae	II		

Sub HCV 1.2 – Potentially Present

Definition	Criteria
Critically endangered species	Critically endangered species (or sub-species) based on IUCN Red List

Interview result indicated that Black spotted Cuscus (*Spiloglossus rufoniger*) can still be found in dry forest areas in the southern part of assessment area. Villagers can easily distinguish this species from Spotted Cuscus (*Spiloglossus maculatus*) that is easily encountered in forest near settlements/villages. Based on land cover and habitat preference, this species is predicted to present within PT NB area. Data on distribution and population of this species is very limited and dated²³. 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 (present or not present) is obtained. Furthermore, all forest landcover or lowland forest ecosystem situated below 1200 mdpl which connected to greater forest area in assessment landscape is considered as potential high conservation value area.

Sub HCV 1.3 – Present

Definition	Criteria
Viable Populations of Endangered, Restricted Range or Protected Species	<ul style="list-style-type: none"> – All CR, EN, VU species as listed on IUCN Red List – Restricted range species (endemic species) present in one island or part of it – Species protected by Indonesia Law (Law no 5/1990) and listed in PP no 7/1999 – Species listed on CITES Appendix I and II

Vegetation: Within assessment landscape, 6 vegetation species classified as Endangered (EN) and Vulnerable (VU) according IUCN Red List are found. They are Flindersia pimenteliana (Rutaceae) (EN), Merbau (*Intsia bijuga* – Fabaceae), Angsana (*Pterocarpus indicus*- Fabaceae), Pala Hutan (*Myristica subalulata* – Myristicaceae) (VU), Buah Taer (*Anisoptera thrurifera* polyandra – Dipterocarpaceae) (VU), and Gaharu (*Aquilaria filarial* – Thymelaeaceae) (Appendix II), which considered as HCV 1.3. All six species were found in relatively good forest habitat. Merbau (*Intsia bijuga*) and Flindersia pimenteliana were encountered in lowland forest and swamp forest ecosystem. The other species, Angsana (*Pterocarpus indicus*), Pala Hutan (*Myristica subalulata*), Buah Taer (*Anisoptera thrurifera polyandra*) and Gaharu (*Aquilaria filarial*), were encountered in lowland forest ecosystem.

Mammals: Four mammal species are considered as HCV 1.3: Black Spotted Cuscus (*Spilocuscus rufoniger*) – CR, Common Spotted Cuscus (*Spilocuscus maculatus*) – CITES Appendix II and PP No 7/1999; and *Phalanger orientalis* – PP No 7/1999, from family Phalangeridae; and Lao-lao (*Dorcopsis muelleri* – Macropodidae) – VU, PP No 7/1999 and endemic. *Phalanger orientalis* and Common spotted Cuscus are relatively easy to find, especially during the night in most of the remaining forest, from swamp forest along the coast to lowland forest. Lao-lao (*Dorcopsis muelleri* – Macropodidae) can be found in lowland forest ecosystem.in the western area of PT NB HGU.

Although total population encountered during field assessment is less than 30 individuals, it is estimated that the actual total population within concession area is more than 30 individuals, and considered viable. The population of Lao-lao (*Dorcopsis muelleri*) is estimated to be high, since this species were often seen crossing the roads, especially in western area of HGU. Deer (*Rusa timorensis*) although classified as protected species, is not a Papuan endemic species. Therefore, deer is not classified as HCV 1.3. As an introduced species, deer is considered as competitor for endemic species. Deer also inhibits the growth of seedlings and saplings of Merbau trees (*Intsia bijuga*). Besides, based on local regulation (KepMenHutBun No. 632/Kpts-VI/1998), deer is allowed to be hunted with quota system, which prevents negative impacts against traditional hunting activities.

Birds: Total 69 species are found. Thirty species are classified as HCV 1.3, consists of five species of Psittacidae, Accipitridae family; four species of Alcedinidae family, 3 species of Paradisaeidae dan Loriidae family; 2 species of Nectariniidae dan Cacatuidae family and 1 species of each family of Bucerotidae, Casuariidae, Cuculidae, Dicaeidae and Meliphagidae. Almost all bird species were easy to find. Most often encountered were Rangkong Papua (*Rhyticeros plicatus*), Kakatua Koki (*Cacatua galerita*) and Chikua kua tanduk (*Philemon buceroides*), which were spread in all ecosystem types. Rangkong Papua (*Rhyticeros plicatus*) and Kakatua Koki (*Cacatua galerita*) often seen in small flocks of 3-4 individuals in the north and south area, and in the remaining forest along rivers (Ibonama, Sima, Warawi, Kalibambu, and Waomi river).

On HCV 5 section, two herpetofauna species will be mentioned as protein source, namely Soa Soa (*Hydrasaurus amboinensis*) and Crocodile (*Crocodylus spp*). These two species are classified as protected under the Law no 5/1990 on the Conservation of Natural Resource and their Ecosystem, and PP no 7/1999 on the Preservation of Flora and Fauna. Although some locations are deemed as suitable habitat to support the presence of the two species, team did not encounter any individuals from these two species for the duration of field survey.

Although total population of each species encountered during field assessment is less than 30 individuals, it is estimated that the actual total population within concession area is more than 30

individuals, and therefore classified as HCV 1.3. Vegetation species composition and forest structure that relatively “natural” and capable to support the presence of these species is established as HCVA 1.3. In short, HCVA 1.3 consists of all natural forest ecosystem within assessment landscape, based on habitat preference of encountered species. Therefore, lowland forest, swamp forest and mangrove and estuarine are established as HCVA 1.3.

Table 27. List of HCV 1.3 Bird Species recorded in and around PT NB

No	Scientific Name	Common Name	Familia	IUCN	CITES	PP	E	M	Note
1	<i>Accipiter novaehollandiae</i>	Grey Goshawk	Accipitridae	LC	II	P			1
2	<i>Megatriorchis doriae</i>	Doria's Goshawk	Accipitridae	NT		P			1
3	<i>Aviceda subcristata</i>	Pacific Baza	Accipitridae	LC	II	P			1
4	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	Accipitridae	LC	II	P			1
5	<i>Haliastur indus</i>	Brahminy Kite	Accipitridae	LC	II	P			1
6	<i>Todiramphus sanctus</i>	Sacred Kingfisher	Alcedinidae	LC		P		M	1
7	<i>Dacelo gaudichaud</i>	Rufous-bellied Kookaburra	Alcedinidae	LC		P			1
8	<i>Melidora macrorrhina</i>	Hooked-billed Kookaburra	Alcedinidae	LC		P			1
9	<i>Tanyiptera nympha</i>	Red-breasted Paradise-kingfisher	Alcedinidae	LC		P	E		1
10	<i>Ardea brachyrhyncha</i>	Yellow-billed Egret	Ardeidae	LC		P			1
11	<i>Rhyticeros plicatus</i>	Papuan Hornbill	Bucerotidae	LC	II	P			1,2,3
12	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Cacatuidae	LC		P			1,2
13	<i>Probosciger aterrimus</i>	Palm Cockatoo	Cacatuidae	LC	I				1,3
14	<i>Casuarius unappendiculatus</i>	Northern cassowary	Casuariidae	LC		P			1,2,3
15	<i>Cacomantis variolus</i>	Brush Cuckoo	Cuculidae	LC	II				1
16	<i>Dicaeum pectorale</i>	Olive-crowned Flowerpecker	Dicaeidae	LC			E		1
17	<i>Charmosyna flacentis</i>	Red-flanked Lorikeet	Loriidae	LC	II				1
18	<i>Trichoglossus haematodus</i>	Coconut Lorikeet	Loriidae	LC	II				1
19	<i>Lorius lory</i>	Black-capped Lory	Loriidae	LC	II				1
20	<i>Philemon buceroides</i>	Helmeted Friarbird	Meliphagidae	LC		P			1,2
21	<i>Cinnyris jugularis</i>	Olive-backed Sunbird	Nectariniidae	LC		P			1
22	<i>Leptocoma aspasia</i>	Black sunbird	Nectariniidae	LC		P			1
23	<i>Paradisaea minor</i>	Lesser Bird-of-	Paradisaeidae	LC	II	P			1,2,3

No	Scientific Name	Common Name	Familia	IUCN	CITES	PP	E	M	Note
		paradise							
24	<i>Lophorina magnifica</i>	Magnificent Riflebird	Paradisaeidae	LC		P			1,3
25	<i>Seleucidis melanoleucus</i>	Twelve-wired Bird-of-paradise	Paradisaeidae	LC		P			1,3
26	<i>Alisterus amboinensis</i>	Moluccan King-parrot	Psittacidae	LC	II				1
27	<i>Geoffroyus geoffroyi</i>	Red-cheeked Parrot	Psittacidae	LC	II				1
28	<i>Eclectus rotatus</i>	Eclectus Parrot	Psittacidae	LC	II				1
29	<i>Loriculus aurantiifrons</i>	Orange-fronted Hanging-parrot	Psittacidae	LC	II				1
30	<i>Micropsitta keiensis</i>	Yellow-capped Pygmy	Psittacidae	LC	II				1

Notes

- IUCN : CR (Critically Endangered/*Kritis*), EN (Endangered/*Genting*), VU (Vulnerable/*Rentan*) EN , LC (Least Concern), NT (Near Threatened)
- CITES : Appendix I: species whose utilization is subject to strict regulations, so as not to jeopardize their survival
Appendix II: species that has not been threatened but will be threatened with extinction if excessively exploited
- PP : Protected base on Law no 5/1990 and PP no 7/1999
- E : Endemic (<http://datazone.birdlife.org/eba/factsheet/172>, <http://datazone.birdlife.org/eba/factsheet/176>)
- M : Migrant
- 1 : Direct Encounter
- 2 : Sound
- 3 : Interview

Sub HCV 1.4 – Not Present

Definition	Criteria
Habitat of Temporary Use by Species or Congregations of Species	Certain species that needs a specific habitat in their life cycle, where they congregate, stay, breed, migrate, etc is considered as keystone habitat

No critical or significant habitat of temporary use (for nesting, resting, and breeding of migratory species) found during survey in assessment landscape. Although some migratory bird species are present (*Todirhamphus sancta*, *Merops ornatus* and *Eurystomas orientalis*), these species commonly reside in various ecosystem type, including disturbed ones (such as homegardens). They are also highly adaptable, which made their supporting areas not critical or not significant. In Papua, all mammal species are not migratory species, and not needed certain habitat in their lifecycle.

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

HCV 2.1 – Not Present

Definition	Criteria
Large Natural Landscapes with Capacity to Maintain Natural Ecological Processes and Dynamics	Core Area >20,000 ha consists of unfragmented natural habitat

Based on ground check and GIS analysis, unfragmented landscape is not present. SPOT 6 satellite imagery recorded on 16 February 2016 and Landsat 8, OLI TIRS path/row 104/62 recorded on 31 March 2017 shown that the remaining forest area is 23,058 Ha, not yet buffered into 3 km, made the core zone less than 20,000 ha.

Intact Forest Landscape (IFL), as determined by Global Forest Watch27, is present within the HCV assessment landscape but not within HGU PT NB. Some part of IFL around the upstream of Waomi rivers suffered from degradation as these areas were used as logging paths. Moreover, this area is classified as APL and Production Forest, included in IUPHHK-HA concession of Jati Dharma Indah.

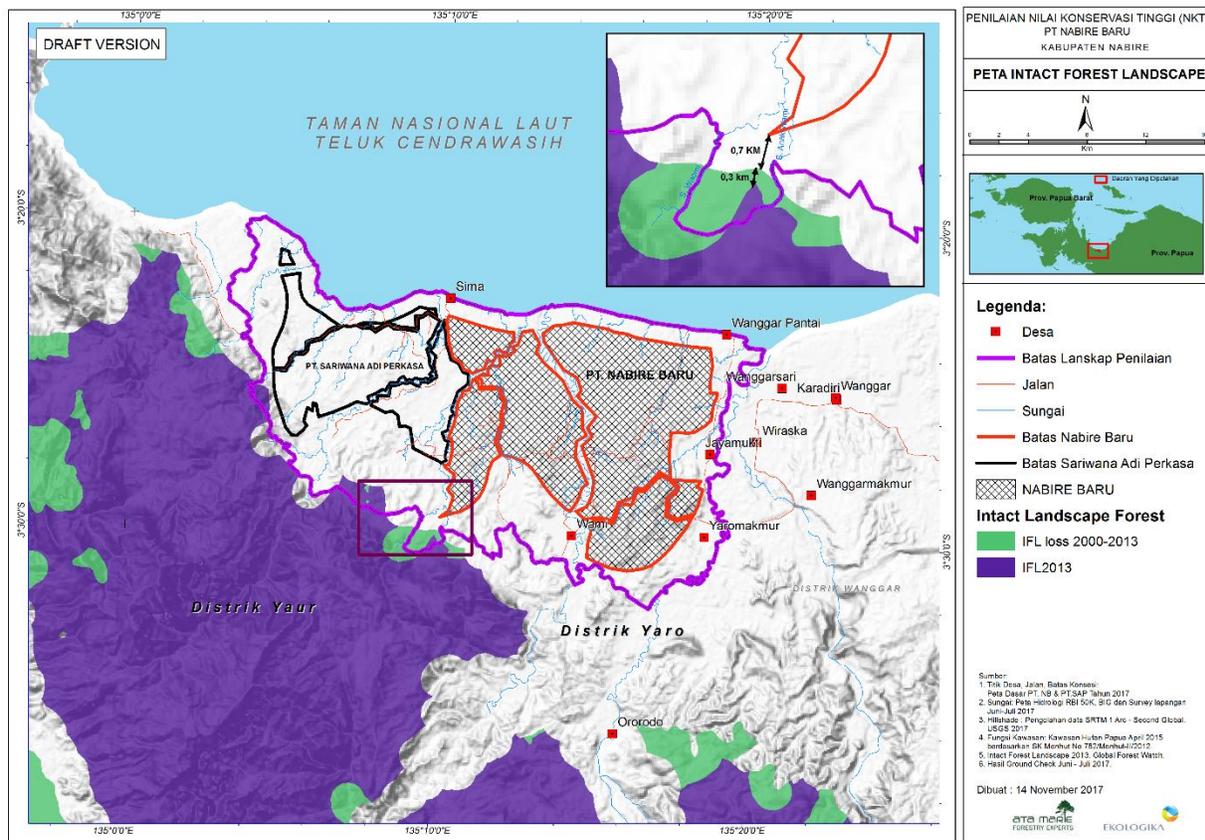


Figure 12. IFL Map in and around PT NB area

HCV 2.2 – Present	
Definition	Criteria
Areas that Contain Two or More Contiguous Ecosystems	Area should have two or more continuous representative ecosystem within landscape – with ecotone/ecoline

Ecosystem mapping and ground check show the presence of six ecosystem types: (1) Lowland Forest on Plains, (2) Lowland Forest on Hills, (3) Mountainous Lowland Forest, (4) Swamp Forest, (5) Mangroves and Estuarine and (6) Lowland Grassland on Plains. On assessment area, ecotone is found, detected between swamp forest and lowland forest on plains. Therefore all boundaries between the two ecosystem types is established as HCVA 2.2.

HCV 2.3 – Present	
Definition	Criteria
Areas that Contain Representative Populations of Most Naturally Occurring Species	Extensive area with surrogate biodiversity/landscape necessary to support such species.

Identification process for HCV 2.3. is as follows: 1) Identify representative/proxy species to assess wider scale area necessary for HCV 2.3, for example group/individual belongs to wide range and low density species; 2) Identify accurate representative/proxy species for natural species composition inside landscape; 3) Based on HCV Identification Toolkit, natural area identified as HCV 1.1 and HCV 2.2 should be considered as potential area of HCV 2.3.

Table 28. HCV 2.3 Proxy Species in PT NB Assessment Landscape

Key Species	Description	Species names
Cassowary	Cassowary is an animal with extensive range and low density important for distributing seeds and fruits. This species is suitable as indicator to represent natural landscape	Northern Cassowary (<i>Casuarius unappendiculatus</i>)
Kangaroo	Kangaroos is the largest native herbivore occurring in Papua rainforest. This animal plays an important role for the function of landscape. Currently, its role is marginalized by the introduction of pigs and deer. Pigs have been present in this island for more than 25,000 years (Flannery,1995), while deer was introduced by the Dutch 80 years ago and only recently distributed to various part of Papua by immigrants. Both species have the potentials to disrupt normal species composition within a landscape. Therefore, monitoring of native herbivore species is essential.	Lao-lao/Wallaby (<i>Dorcopsis muelleri</i>)
Eagles	Most eagles are capable to live in various habitat, including disrupted habitat and forest mosaic. However, the presence of these species in a certain area indicated various prey species available and a healthy ecology at the landscape scale.	Grey goshawk (<i>Accipiter novaehollandiae</i>) Doria's goshawk (<i>Megatriorchis doriae</i>) Pacific baza (<i>Aviceda subcristata</i>) Collared sparrowhawk (<i>Accipiter cirrocephalus</i>) Brahminy kite (<i>Haliastur indus</i>)
Pigeons	Among five large lowland Papua pigeon species, three are present in this area. As tall forest and edge forest species, these pigeons can be identified easily by their sounds	Collared imperial pigeon (<i>Ducula mullerii</i>) Zoe's imperial pigeon (<i>Ducula zoeae</i>) Pinon's imperial pigeon (<i>Ducula pinon</i>)
Lories and Cockatoo	Ten species of lories and cockatoo have been identified within assessment area. These bird varied in size, food preferences and nesting preferences, from the very small Perkici	Coconut lorikeet (<i>Trichoglossus haematodus</i>) as the smallest; Palm cockatoo (<i>Probosciger aterrimus</i>) as the largest; Moluccan king parrot (<i>Alisterus amboinensis</i>); Red-cheeked parrot

Key Species	Description	Species names
	Pelangi (<i>Trichoglossus haematodus</i>) to the huge Kakatua Palem (<i>Probosciger aterrimus</i>). The presence of these species in landscape is the best indicator and most suitable proxy for natural landscape condition.	(<i>Geoffroyus geoffroyi</i>); Eclectus parrot (<i>Eclectus roratus</i>); Orange-fronted hanging parrot (<i>Loriculus aurantiifrons</i>); Yellow-capped pygmy parrot (<i>Micropsitta keiensis</i>); Red-flanked lorikeet (<i>Charmosyna flacentis</i>); Rainbow lorikeet (<i>Trichoglossus haematodus</i>); Black-capped lory (<i>Lorius lory</i>); Sulphur-crested cockatoo (<i>Cacatua galerita</i>), Kakatua raja (<i>Probosciger aterrimus</i>)
Hornbill	Papua hornbill has an extensive range that is important for the distribution of fruit seeds in all part of the landscape. The presence of this easily recognized species in the landscape displays the general impact in the landscape overall.	Papuan hornbill/ Blyth's hornbill (<i>Rhyticeros plicatus</i>)
Bird of paradise	Three species bird of paradise can be found in this area. Each species lives in different niche habitat in the forest. Seleucidis melanoleuca prefers swamp forest and flat lowland rainforest, while Paradisaea minor likes to perch in tall trees with open canopy. The combination of these species is useful and easily recognized (form their sound) as the representative of natural composition of the landscape.	Lesser bird-of-paradise (<i>Paradisaea minor</i>), Magnificent Riflebird (<i>Lophorina magnifica</i>), Twelve-wired bird-of-paradise (<i>Seleucidis melanoleucus</i>).

3.3.3.3 Explanation for HCV 3 Identification – Rare, threatened, or endangered ecosystems, habitats or refugia

HCV 3 – Present	
Definition	Criteria
Rare, threatened, or endangered ecosystems, habitats or refugia.	<ul style="list-style-type: none"> - Threatened <ol style="list-style-type: none"> 1. Lose 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. - Rare: natural ecosystem that covers less than 5% of biogeographical area.

Analysis to rare and threatened status, implemented to the greater geographical unit, was conducted based on HCV 3 criteria above. If the current range of a regional proxy ecosystem has dwindled more than 50% of its historical distribution for Northern Papua or specific for concession area, such ecosystem is considered threatened. If current range of a regional ecosystem is less than 5% of total range of all natural ecosystem 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: Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, mangrove and estuarine

ecosystem and water bodies/lakes Although these ecosystem are identified as high conservation value area, PT NB does not have any area that is important for the management of this HCV 3 within its HGU area.

3.3.3.4. 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. – Hutan pada wilayah DAS dalam kondisi baik berfungsi dalam pengaturan air di bagian hilir. Jika area ini memberikan jasa terhadap pemenuhan air atau sebagai pengendali banjir. – Ekosistem hutan seperti hutan berawan, hutan pada punggung gunung (ridge forest), ekosistem riparian, hutan karst, dan berbagai ekosistem lahan basah, termasuk lahan gambut (terutama yang masih berhutan), rumput memiliki fungsi hidrologis yang luar biasa penting.

High rainfall in Central Papua area frequently causes annual flood in the assessment area. In general, forest cover condition in watersheds of Waomi River, Kali Bambu River, Wami Rier, Ubai River, Wanggar River, Yaro River, Odiyami River, Inmertehe River and Ayaare River are in good condition. Natural vegetation that can help control flood is still present. River buffer zone are established in accordance to Laws and adopt RSPO guidelines on river management. Besides, existing swamp forest ecosystem is crucial in controlling flood and providing fresh water.

Natural vegetation of Hamatre mangrove and estuarine forest at Wanggar River is able to protect the shoreline against abrasion and protect natural vegetation nearby from salt spray through filtration process. All water bodies and their banks, mangorve and estuarine ecosystem, swamp forest ecosystem in PT NB assessment area are considered as HCVA 4.1.

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

Based on field observation and GIS analysis, the potential erosion hazard is low to very high (TBE>180 ton/Ha/Year) with slope gradient >40%. Hills within assessment area generally have excellent understory and vegetation that must be protected to prevent erosion due to high rainfall. Roots system of understories and forest helped water retention and prevent soil erosion – their existence must be preserved due to high rainfall level in the region. Therefore, area with TBE>180 ton/ha/year is considered important to control erosion and sedimentation.

HCV 4.3 – Present	
Definition	Criteria
Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	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.

NASA hotspot data 2012-2016 revealed that on 2014, small scale fires have occurred inside PT NB area. However, in 2017, no hotspot found in the area. Interviews and field observation show that area surrounding concession area never suffered from large scale fire.

Landsat imagery analysis and field observation indicate that the remaining forest (lowland forest and swamp forest) acted as buffer against fire. Large rivers such as Wami River, Wanggar River and Yaro River with unfragmented waterbanks also play a significant role as natural fire barriers.

3.3.3.5. Explanation for HCV 5 Identification – 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.

HCV 5 – Present	
Definition	Criteria
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.	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.

HCV 5 attributes are resources or major locations to fulfil basic needs and provide income sources. Resources/locations are managed and harvested by local people to fulfill their needs (food, drinks, clean water, firewood, etc) or sold to generate money to buy other basic needs (clothing, housing, transportation, education, health, etc).

Table 29. Summary of HCV 5 Identification in PT NB Area

Groups	Attributes	Locations
Carbohydrate Source	Natural and cultivated sago Tubers (betatas, ubi jalar, singkong, sukun hutan)	Manawari, Heragaje, Hamare, Herajare, Mahuaje, Harakre, Wejure, Erungkre, Wanerie, Ohau Kerarara, Yarawobi, Ubai, Ayaare, Bahoom Wau, Odiyami, Pandera, Toihai ohawei, Wami, Paherbim, Oatamu Uhu.
Protein Source	Freshwater fish: Ikan gabus, lele, bethik, tawes, gurami, nila Brackish water fish: bolana/belanak (mullet fish), somasi (bass), kakap putih (baramundi), kakap merah	Sima River, Waomi River, Wami River, Yaro River, Rawa Beku, Warawi River, Ibonama River, Kali Bambu River, K. Maido (great and small), K. Pinang, K. Agas, Wanggar River, Hamatre River, Ubai River, Ayaare River, Odiyami River, Toihai ohawei River, Ayaare Swamp, Ubai Swamp,

Groups	Attributes	Locations
	(mangrove jack) Saltwater fish: kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan besi, sako, puri	Paherbim Swamp, Odiyami Swamp Plantation canals of PT NB Offshore Sima Village, in reefs; Bokor (1&2), Mandabiak, Gigerubuh, Udrade, Mahat, Harui, Woka (small-great), Koroba, Bia, Bengkok, Nania, Maleo, Petrus, P. Numburi Off shore Wanggar
	Non-fish: eel, prawn, crab, soa-soa, snake, crocodile, kerang/bia, ulat kayu bakau, bats, octopus, suntung,	Sima River, Waomi River, Wami River, Warawi River, Ibonama River, Kali Bambu River, K. Maido (great and small), K. Pinang, K. Agas, Wanggar River, Hamatre River, Yaro River, Ubai River, Ayaare River, Odiyami River, Toihai ohawei River, Ayaare Swamp, Ubai Swamp, Paherbim Swamp, Odiyami Swamp
Freshwater for Drinking and Cooking	Well (groundwater), Springs	Wells in settlements: Sima Village, Wanggar Pantai Village, Wami Village, Yaro Makmur Village, Jaya Mukti Village Parigi Hamuku Spring
Freshwater for Sanitation	Well (groundwater), River	Wells in settlements: Sima Village, Wanggar Pantai Village, Wami Village, Yaro Makmur Village, Jaya Mukti Village Wami River, near Wami Village Yaro River, near Yaro Makmur and Jaya Mukti Village
Direct Income Source – Marine Products	Marine products: kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, halus/nasi	Offshore Sima Village, in reefs: Bokor (1&2), Mandabiak, Gigerubuh, Udrade, Mahat, Harui, Woka (small-great), Koroba, Bia, Bengkok, Nania, Maleo, Petrus, P. Numburi Offshore Wanggar Pantai Village
Direct Income Source – Game Animal	Game animals: pig and deer	Wami Village, Yaro Makmur Village, Jaya Mukti Village: <i>Lahan Usaha 1</i> and <i>Lahan Usaha 2</i>
Craft Material	Bark: genemo, sukun hutan, keleri, tiyuweh	Wami Village, Yaro Makmur Village, Jaya Mukti Village: <i>Lahan Usaha 1</i> and <i>Lahan Usaha 2</i> ; Forest adjacent to <i>Lahan Usaha 2</i>
Subsistent Land	Rainfed field Vegetable and Fruit Garden: rica (cabe), corn, stringbeans, peanut, green bean, banana, sawi, ubi jalar, cassava, gedi, bayam, labu, timun, pare	Vegetable and Fruit Garden, rainfed field in Wami Village, Yaro Makmur Village and Jaya Mukti Village (<i>Lahan Usaha 1</i> and <i>Lahan Usaha 2</i>); Forest adjacent to <i>Lahan Usaha 2</i>)
Fuel	Wood: Reside (cacao cover crops), lamtoro and merbau branches, matoa, genemo, besi, minyak Bamboo	Wami Village, Yaro Makmur Village, Jaya Mukti Village: <i>Lahan Usaha 1</i> and <i>Lahan Usaha 2</i>
Traditional Medicine	Daun gatal, mengkudu, sarang semut, tali kuning, akar kuning	Wami Village, Yaro Makmur Village and Jaya Mukti Village (<i>Lahan Usaha 1</i> and <i>Lahan Usaha 2</i>); Forest adjacent to <i>Lahan Usaha 2</i>)
Construction Material – Timber	Timber: merbau, matoa, agatis, damar, masoi, empaka, lawang	Forest around Sima Village and Wanggar Pantai Village

Groups	Attributes	Locations
Construction Material – Non Timber	Nibung stem and leaves Rattan	Forest around Sima Village and Wanggar Pantai Village
Fodder	Rumput gajah and kalanjana	Wami Village, Yaro Makmur Village, Jaya Mukti Village: <i>Lahan Usaha 1</i> and <i>Lahan Usaha 2</i>
Vitamin Source	Forest fruit (cempedak, dll)	<i>Dusun Cempedak</i> , near <i>Goa Nenggoina</i> and <i>Goa Nenggomana</i>

3.3.3.6. Explanation for HCV 6 Identification – Cultural Values

HCV 6 – Present	
Definition	Criteria
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.	<ul style="list-style-type: none"> – Sites, resources, habitat and lanscape with high cultural value, recognized by national policy and legislation – Sites, resources, habitat and lanscape established legally from national government and/or international institution such as UNESCO – Sites, resources, habitat and lanscape with recognized important historical and cultural value, even if not protected by legislation. – Religious or sacred sites, resources, habitat and lanscape (cemetery, or site for traditional rites, which is important to local community) – Plants or animal with totemic value or used in traditional ceremonies.

The only UNESCO World Heritage Site in Papua Province is Lorentz National Park, that spans across several Regencies (Asmat, Intan Jaya, Jaya Wijaya, Lanny Jaya, Mimika, Nduga, Paniaia, Puncak Jaya, Yahokimo). The National Park is 189 km from assessment landscape and there is no known link between Yerisiam and Wate Tribe, and various tribes currently residing in the National Park (Amungme/Damal, Dani Barat, Dani Lembah Baliem, Moni, Nduga, Asmat, Kamoro dan Sempan).

Among the 107 national cultural heritages (objects, buildings, structures, sites, area) according to Ministry of Education and Culture³⁰, none of them are located at Papua Province. According to Papua Archaeological Office, Jayapura, there is no enactment or proposition for local (province) cultural heritage inside SAP landscape or Nabire district. “Sacred sites” or “important cultural sites for local communities” mentioned in Table 9 should be regarded as “sites with recognized important historical and cultural values, even if not protected by legislation”.

Assessor has identified HCV 6 attributes through FGDs, consulted and established them in participatory manner through consultation with community representatives.

Table 30. Summary of HCV 6 Identification in PT Nabire Baru Area

Type	Attributes	Location	Description
Sacred Sites	Goa Nenggoina	Sima	Sacred cave, Not every people are allowed to enter. There are unwritten rules and prohibitions, and traditional beliefs passed down from generation to
	Goa Nenggomana	Sima	

Type	Attributes	Location	Description
			generation.
	Ruija	Sima	Old sites of Yerisiam Tribe Village. Grassland, often burned to encourage grass growth, to lure game animal (deer).
	Rujahi	Sima	
	Parigi Hamuku	Sima	Sacred springs. Still used as freshwater source for Sima Village. Submerged during high tide.
	Old Hamuku Village	Sima	Old site of Yerisiam Tribe Village
	Busuk River (Rarantiruma) ⁴	Sima	Sima Villagers believe the river can cure skin disease
	Air Mabuk ⁵	Sima	Located near protected forest. Local people believe that the water will cause drunkenness in animal that drink from it.
	Anapireoonggre (in Yaur language)/ Babrauguapi (in Yerisiam language)	Sima	Sacred sites. Animals and wood in this area are believed to be toxic and cannot be utilized
	Bahoom Wau	Wanggar Pantai	<i>Bahoom Wau</i> means "Dance together". In this place, ancestor of Wate Tribe and Yerisiam Tribe dance together in peace gathering following prolonged war. Still considered sacred and important site for both tribes.
	Hamatre (Aha Juha)	Wanggar Pantai	Hamatre and Ubaina were sites where traditional ceremonies used to be held. However, such ceremonies were no longer celebrated due to conversion to Christianity in 1970s. Still considered sacred sites.
	Ubaina	Wanggar Pantai	Sacred site for Wate Tribe
	Tanjung Cemetery	Wanggar Pantai	Cemetery for family members and elders of Wate Tribe
	Goa Wamora	Yaro Makmur	Sacred site for Wate Tribe
Culturally important Sites	Beku Swamp	Wami	Local icon for recreation site, open for public. It was a river which turn into swamp or lake, located near <i>Lahan Usaha</i> 1. Belongs to village, with status <i>Tanah Ristan</i> . Currently used as recreation sites, fishing sites, etc.
	Dusun Sagu, Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi	Sima and Wanggar Pantai	Sago plant is the cultural identity of Papuans, and used in every kind of traditional ceremonies. Also seen as unification factor for Papua people.
Culturally important species	Bird-of-Paradise, Sago (Metroxylon sago)	Sima and Wanggar Pantai	Bird-of-Paradise symbolize the prosperity in native culture. Sago is local identity for Sima and Wanggar Pantai people. Every traditional ceremony will use sago as part of traditional culture, and seen as unification

⁴ Located outside assessment landscape, but identified as HCV 6 by local people

⁵ Located outside assessment landscape, but identified as HCV 6 by local people

Type	Attributes	Location	Description
			symbol for Papuan tribes.



Sago Groves in Sima Village



Sacred site of Ruija in Sima Village

Figure 13. Photos of HCV 6 in PT Nabire Baru Assessment Area

During FGD and Ground check in Yerisiam Tribe territory with local villagers, assessor obtained conditions and mapped indicative location of Sago Grove/Dusun Sagu, which is sacred fro Yerisiam Tribe. The biggest Sago Groves belong to Yerisiam Tribe is located in the south of Sima Village, in a swamp area where sago plants, both natural and cultivated, can be found among other forest vegetation (such as pandan, ketapang, matoa, etc). Analysis of 2015 – 2017 Landsat image and ground check result showed that 7 ha sago groves, which was located inside HGU of Akaba Sub-Tribes, was cleared for smallholder plantation.

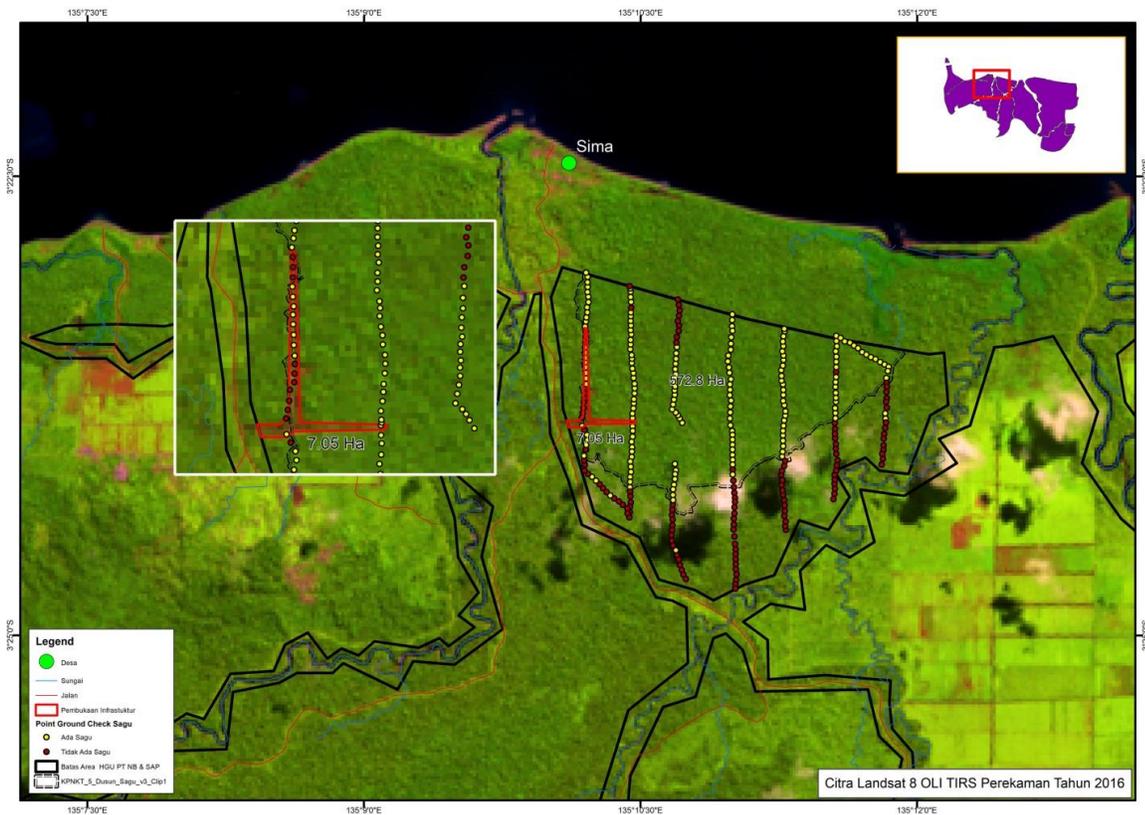


Figure 14. Land Clearing of Sago Groves in south of Sima Village

3.3.4. Stakeholder Consultation

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 (20 - 25 August 2017) to obtain agreement on the results themselves as well as management and monitoring HCVs – 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 (8 June 2017) and after the assessment (30-31 Agustus 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 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. One issue that was consulted at length included the areas of HCVA that overlap with the planned smallholder (plasma) areas of PT NB. In general, all representatives of local communities expressed concern that areas of HCVA will reduce the area of their “plasma”. However, it is necessary for PT NB to enforce the management of HCV 1-4 in accordance to Goodhope Sustainability Policy and communicate the policy to tribe representatives.

Assessor also received two Letter of Statement, one dated 7 September 2017, from the representative of Wate Tribe Indigenous Group (from Wanggar Pantai Village) and Waoha Tribe Indigenous Group (from Sima Village); and another dated 8 September 2017 from the representative of Akaba Tribe, Sarakwari Tribe and Koroba Tribe (Sima Village). Summary of stakeholder consultation can be found in Table 31.

Table 31. Summary of Stakeholder Consultation Results

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
Workshop (8 June 17)	Andre Barani (Yayasan Pusaka)	Yayasan Pusaka conducted participatory mapping on important areas for community, especially sago, with different result compared to mapping conducted by company.	Social survey will allocate sufficient resource and time for a rapid survey in/with communities/tribes in Sima Village. Assessor will use “participatory map” both from Yayasan Pusaka and company. (Up to the end of the survey, Yayasan Pusaka did not share their map version) Social survey will conduct ground check or participatory mapping for HCV-HCS assessment purposes: important livelihood areas and culture
Workshop (8 June 17)	Amon Rumatarai (Fishery Office)	A special assessment is necessary to map areas, since in Papua creating village area map is difficult if based on customary map	Survey that will be conducted is rapid survey, therefore such request is beyond the scope and capacity of this survey. The suggestion will be put in recommendation on HCV and spatial management.
Workshop (8 June 17)	Andre Barani (Yayasan Pusaka), Gunawan (Yeresiam Gwa Tribe), Herman Sayori (Nabire Customary Council/ <i>Dewan Adat</i> Nabire), Petrus Amafnini (Sawit Watch)	Survey area must be informed to local communities/tribes Identification must be conducted together with elders and communities in Sima Village. Do not ignore people in Sima Village. Implementation of FPIC principles in relation to performance and future planning.	HCV survey method and approach (including for HCV 1-3) is participatory, including village level consultation (note: FPIC, HCV/HCS management). Team will invite and involve chieftain in village consultation and stakeholder consultation.
Workshop (8 June 17)	Robertino Hanebora (Yerisiam Tribe member)	Strategy to transfer HCV knowledge (terminology, concept, practices) to local community is necessary	Will be conducted in adherence to good practices during FGD with local community, village consultation, FPIC will be practiced. Assessor will provide concise document of HCV identification results, management and monitoring recommendations, and thematic maps which deemed necessary or based on request, as long as within authorization level and assessment purpose
Workshop (8 June 17)	Yoteni (Regional Disaster Management Agency)	Potential of impact of oil Palm plantation on available water resources in the river buffer – could result in communities not having enough water.	Identify potential internal threats on water availability at present and into the future. Recommendation for management of HCV /

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
			HCVa for conservation of water resources, especially the continued monitoring of availability for communities (HCV 4.1 and HCV 5).
Workshop (8 June 17)	Andre Barani (Yayasan Pusaka), Yakonias Yoweni (Sima Village)	The company is thought to have already destroyed several areas of livelihood and cultural importance to local communities (Sago groves and sacred areas in Akhiya and Ruhija). Need to find a solution for these areas that have been lost to oil palm.	Clarify through <i>ground checks</i> and participatory mapping in the field. Results delivered to the community affected. Follow-up solutions are the responsibility of the company.
Workshop (8 Jun 17)	Herman Sayori (Nabire Customary Council), Gunawan (Yerisiam Gwa Tribe), A. Hamid (Teluk Cendrawasih National Park Office, Regional I Nabire), M. Y. Runaki (Plantation and Agricultural Office)	<i>Dusun Sagu</i> must be protected – as local identity, and should not be converted into oilpalm plantation (<i>plasma</i> or <i>core</i>). The locations of <i>Dusun Sagu</i> should be mapped in participatory manner	<i>Dusun Sagu</i> will be mapped participatory (Participatory Mapping Report) during HCV survey. <i>Dusun Sagu</i> as HCV 5 had been confirmed through FGD in village level, and consulted in village consultation. Local people/cooperative should decide whether or not they will release <i>Dusun Sagu</i> area from <i>plasma</i> area planning. Check HCV 5 map and Chapter on synthesis.
Workshop (8 Jun 17)	Herman Sayori (Nabire Customary Council), John Weah (Satya Wiyata Mandala University/USWIN)	Review on HGU area (reserve area, planting area, planted area) to resolve conflict between company and local tribes.	Synthesis map will be provided in the report – to give recommendation on rearrangement.
Workshop (8 Jun 17)	Yoteni (Regional Disaster Management Agency)	Protection in the HCV approach – need to ensure not only conservation of the areas but also population of important species (i.e. Birds of Paradise)	The aims of HCV management should be focused on the intrinsic value not on forest or no-go areas. Recommendation for HCV management will be supplemented to ensure this.
Workshop (8 Jun 17)	A. Hamid (Teluk Cendrawasih National Park Office, Regional I Nabire)	PHKA 2012 regulations for identifying and inventory of Essential Ecosystem Areas (<i>kawasan ekosistem esensial</i>) for wetlands and dryland can be used as basic approach for HCV management	Assessors used recommendations for management that are inline with the conservation principles of Essential Ecosystem Areas (e.g. corridors).
Workshop (8 Jun 17)	Manuel Miniro (Natural Resource Conservation Agency/ Teluk Cendrawasih Marine National Park)	Need to identify the operational impact of PT SAP on the national Park (Sima area)	Analysis on links between company operations and conditions of concession area with Teluk Cendrawasih NP. Impacts of plantation – including utilization limit of HCV management area, should not divert risk of exploitation to

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
			NP.
Workshop (8 Jun 17)	Petrus Amafnini (Sawit Watch)	Riparian strips along rivers are not just 50m, but can be 100 or 150m wide. Peat forest ecosystems should be excluded from the planting areas.	Assessor will follow Keppres No. 32 / 1990, PP No.26/2008, PP No.38/2011 regulations but also adopt RSPO Riparian management and monitoring.
Community Meeting (22 Aug 17) (at Traditional House Sima Village)	Sima Village, 24 participants: Daniel Inggeruhi (Village official); Benni Yarawobi (Secretary of Cooperative); Marariampi, Meliamus Yarawobi, Benni Inggeruhi, Demianus M, Amelia Akubar, Agus Runggeari, Otis R, Lis Rumaterai, Yuliana Akubar, Yuspina Henawi, Yurmina Monei, Yan W, Agus Rumatray, Othys Wropen (Yerisiam Tribe); Ayub Kuwoy (Head of LMA, Lembaga Masyarakat Adat/ Indigenous Peoples' Council) Yunus Monei (Head of KPMA Waoha); Pieter R Dimara (Acting Head of Sima Village); Alberth Nanaor (Head of KPMA Sarakwari and Koroba); Melvin Monei (Village Secretary Sima Village); Yakobus; Ninil; Abrar Ramlan	Dusun Sagu must become HCV 5 Add Sungai Busuk (Rarantiruma) to HCV 6 Smallholder/plasma area should not be taken for HCV area Local community should be represented in consultative workshop in Kabupaten/Regency level: 2 prople from village government, 2 from tribes. They will be appointed by local community	Revise HCV 5 and HCV 6 identification result. Revise HCV management recommendation. HCV identification result, HCV presence map and HCV management will be provided to each tribe/cooperative and village government to be reviewed prior to consultative workshop in Nabire Regency; any decision might be submitted before or at the workshop. Local community entitled to legal counsel in the negotiation process of HCV management, especially in relation to smallholder. The process of determining HCV management strategy. List of representative names for consultative workshop in Kabupaten.
Community Meeting (23 Aug 17, Wanggar Pantai Village)	Wanggar Pantai, 35 partcpts. Maikun (KPMA member) Aleks M (village secretary) Enos M (KPMA secretary) Abner Monei (KPMA treasurer) Kilyon Wai (KPMA Member) Fwainggeri (Villagers) Leonard Nanaor (Village Head) Maichel Hao (Villagers) Dominggus Hao (Villagers)	HCV 5. Sago management, buffer is necessary during harvesting to prevent damage to oilpalm and other trees Smallholder land should not be taken for HCV purposes If HCV is in smallholder lands, the land should be replaced with lands in APL If necessary, Wanggar Pantai people will seek legal action to enforce their decision. Community will be represented by 2 government	

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
	Oni Matundoy(Villagers) Lanjar H (Villagers) Rudia Hao (Villagers) Imelda Hao (Villagers) Rodina Wai (Villagers) Sarfince Hao (Villagers) Lilis (Villagers) Enggelina Hao (Teacher) Lenrce S (Villagers) Demorce Monei (Villagers) Ludia Hao (Villagers) Martha Monei (Villagers) Agus Wai (Villagers) Petrus Hao (Villagers) Isal Rumbiak (Villagers) Sapter Monei (Villagers) Yakonas Hasio (Villagers) Ramarasa (Villagers) Marinus Raiki (Villagers) Otis Nanaur (Villagers) Leonard Monei (Villagers) Habel Monei (Villagers) Asep Wahyu (Ata Marie) Tri Setyadi (Ekologika) Abrar Ramlan (EHS Goodhope) Bistok (EHS PT Nabire Baru)	officials and 2 representative from tribes/cooperatives, in stakeholder consultation. Representatives will be appointed by the community themselves.	
Community Meeting (22 Aug 17, at Bapak Santo's House Wami Village)	Wami Village, 14 participants Rusmani (villagers) Kadizar (villagers) Mahri (villagers) Rumbianto (villagers) Darmuji (villagers) Elias (villagers) Susanto (villagers) Damianus Dago (livestock farmer) Miaswar (Babinsa) Sunardi (villagers)	Add HCV 5 attributes: Direct Income Source, Subsistent Land, Freshwater source for Drinking and Cooking, Freshwater source for Sanitation, Craft Material – with information/location clarification. Community representative in stakeholder consultation in Regency level, will be elected by the community themselves.	

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
	Fatimah (Pendidikan Kesejahteraan Keluarga/PKK representative) Wiwik (Pokja IV representative) Imam Tabroni (villagers) Mugi (villagers)		
Community Meeting (23 Aug 17, TK. Pelangi- Yaro Makmur Village)	Yaro Makmur, 17 participants Fuad R (Village Secretary) Suryadi (Villagers) Giyono (Villagers) Suyono (Villagers) Anwar (Villagers) Sugi (Villagers) Tega (Villagers) Edi (Villagers) Rusdi (Villagers) Elki Matuan (Bamuskam) JJ Managi S.pd (Teacher) Herman (Villagers) M Tamara S.pd (Teacher) Sumiyati (PKK treasurer) Nurchayati (Dasawisma) Ahmad Naim (Villagers) Kibar K (Village Head)	Add HCV 5 attributes: Traditional medicine, fuel, with information/clarification location Village often suffered from flood since 2000, caused by logging companies Mining activities in upstream Yaro River pollute the river Community representative in stakeholder consultation in Regency level, will be appointed by the community themselves	
Community Meeting, (24 Aug 17, Pustu – Jaya Mukti Village)	Jaya Mukti, 19 participants Marta (Villagers) Musfiyatin (PKK) Kastirah (Villagers) Marsimus (Village Secretary) Magdalena B (Mee tribe) M. Ponco (Villagers) Sayuti (Villagers) Edi Siswanto (Villagers) Munir (Villagers) Siti Asmanah (Villagers) Sunardi (Villagers) Tamsi (Villagers) Sunardi (Villagers)	Add HCV 5 attributes: Carbohydrate Source, Protein Source (fish), Vitamin Source (Vegetable and Fruit), Traditional Medicine, Fuel, Direct Income Source, Subsistent Land, Freshwater source for Drinking and Cooking, Freshwater source for Sanitation, Fodder sites – with information/location clarification. Flood due to Yaro River overflow poses as major problem for the village Community representative in stakeholder consultation in Regency level, will be appointed by the community themselves	

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
	Sukemi (Villagers) Ribut S (Villagers) Hadiyanto (Villagers) Yosepina M (Midwife) Teguh P.S (Villagers) Siti Khanifah (Teacher)		
(Workshop) 30 Aug 17	Irwan Efendi (Natural Resource Conservation Office Nabire Regency), Wilson (KASIH Papua)	The company is advised to implement collaborative management and monitoring with government institutions, communities and other stakeholders in the landscape	Accommodated in the HCV management and monitoring recommendations.
(Workshop) 30 Aug 17	Gunawan Inggeruhi (Yerisiam Tribe)	Important for relevant authorities to enforce the law if there have been encroachments and Encroachments must be communicated to relevant authorities.	Accommodated in the HCV management and monitoring recommendations.
(Workshop) 30 Aug 17	Roberthino (WaohaSub-Tribe, Sima), Irwan Efendi (Natural Resource Conservation Office Nabire Regency), Marry H Lidan (Marine and Fisheries Office)	Important to not only do management of terrestrial HCVs but also marine HCVs (Teluk Cendrawasih National Park).	The boundary of the assessment landscape is terrestrial based, however, if there is direct impact on the marine environment (marine and HCV within them) these threats (and monitoring of HCVs) should be managed by the company.
(Workshop) 30 Aug 17	Roberthino (Waoha Sub-Tribe, Sima), Ayub Kowoy (Nabire Indigenous Peoples' Council)	What is the basis of riparian river buffers when defining HCV management areas.	Assessor will follow Keppres No. 32 / 1990, PP No.26/2008, PP No.38/2011 regulations but also adopt RSPO Riparian management and monitoring. Also, the riparian condition, activities within it had potential threats will be taken into consideration.
(Workshop) 30 Aug 17	Sopater Samanui (Public Works and Spatial Planning Office), Tauhid (Environmental Agency), Sumin Kaimudin (Staffs Yaro District)	Mining of sand and gold, as well as large scale and small scale logging in upstream areas can cause flooding reduces water quality, and sedimentation. Communities are heavily impacted by this.	This is clearly an external threat to HCV 4. Recommendations to encourage village regulation for sand and gold mining that operate around the village.
(Workshop) 30 Aug 17	Hengky (Sima community member)	Fire is traditional used by communities to open up land during the dry season which increases the threat of forest fires.	Based on hotspot data (2012-2016), most fires were in the vicinity of villages. There is potential for threats to HCV areas that are close to these village areas.
(Workshop) 30 Aug 17	Wilson (KASIH Papua), Hengky (Sima community member)	he concept of conservation needs to be given to local communities. Need for Media and information	Awareness and education has been incorporated into the recommendations.

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
		about HCV and management of HCVs and the HCV areas should be available in the villages.	
(Workshop) 30 Aug 17	Klemens Danomira (Environmental Agency Nabire Regency)	HCV 5 will reduce the area of plasma. If this has been agreed by communities there is no problem but if this has not been agreed upon this could lead to social jealousy	In general during consultation at the village level, areas of sago were identified as HCV 5. Each cooperative will discuss further but up until the post assessment workshop, no results had been received. The maps shown at the workshop were draft versions and could be different to those in the final report.
Workshop (30 Aug 17)	Gunawan Ingeruhi (Yerisiam Tribe)	Sago swamp will be discussed internally first in the community. I do not agree with Pak Ayub that community is at fault. However, from the beginning, local community never been invited/involved. Hope that this will change in the future.	Recommendation will still mention the implementation of FPIC principles in HCV management. All truthful/accurate information, including risks/consequences, should be discussed with local community.
Workshop (30 Aug 17)	Roberthino (Waoha Sub-tribe - Sima)	During 2016 an areas of sago was cleared in PT SAP by Akaba Cooperative, and a complaint was sent to Yayasan Pusaka.	Important to note that there is a testimony concerning this. This areas was not identified during the HCV assessment of 2011 or 2014.
Workshop (30 Aug 17)	Ayub Kowoy (Nabire Indigenous Peoples' Council)	Related to sago and swamp, past stakeholder never know that the area has the potential as HCV area. Government also followed pre-existing rules. After enlightened and come to realization that everybody is at fault, it is beneficial if we stop the blame game, and make some improvement	Assessor will wait for the response or decision from right holders of <i>Dusun Sagu</i> area.
Workshop (30 Aug 17)	Marry H Lidan (Marine and Fisheries Office)	How company treat waste?	Company is responsible to treat waste. Waste management is part of HCV management framework and part of company responsibility for non-HCV environmental management
Workshop (30 Aug 17)	Niko Kaiway (Head of KPMA Wate Tribe)	Customary right holders will suffer the loss if smallholder areas can not be utilized. Request to NGO and RSPO to resume smallholder plantation. If, necessary community will use legal assistance	The potential loss of smallholder/plasma area is addressed by the new planting plan, which intends to provide plasma plantations to meet obligations to communities
Workshop (30 Aug 17)	Roberthino (Waoha Sub-Tribe - Sima)	<i>Dusun Sagu</i> and other important area (<i>ruija</i>) have been agreed to be kept intact. However if smallholder area is overlap with other HCV, sub-tribes will internally discuss the situation before	Until the end of report preparation process, assessor never receive indication/specific direction of location/polygon which will be retained as smallholders plantation from sub-

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
		deciding anything.	tribes/cooperatives.
Workshop (30 Aug 17)	Kipli Anak Ayom (General Manager NB/SAP)	The company has renewed its sustainability policy (NDPE 2017). Of the 3 parts to this policy, 2 refer to the environment and demonstrates our commitment for not clearing peat land areas, high carbon stock forests and HCV 1-6 areas. If there is any sago, this area will not be cleared. All national regulations will be followed including the distribution of 80/20 company / smallholder areas. The consequences of this commitment are that the company plantation has been reduced to 51%. The company will hand these areas over to the community because they cannot be planted and many NGOs are monitoring the situation.	The company has a policy of no-deforestation and no development on peat. That are inline with the principles and criteria of RSPO. The areas of peat and forest (as well as other HCV) are identified in this assessment.
Workshop (30 Aug 17)	Aswadi Hamid (National Park Management Division, Region I Nabire), Hengky (Sima Community Member)	Sago is important for Papuan's identity and essential for traditional ceremonies. All FGD groups agrees that Sago was a cultural important value that must be conserved = HCV 6.	Sago groves are identified as HCV 6. as well as HCV 5. Therefore, the management of sago groves that are overlapping with planned <i>plasma</i> areas should be decided by communities themselves – stay as HCV (no-go areas) or removed.
Workshop (30 Aug 17)	Aswadi Hamid (National Park Management Division, Region I Nabire), Hengky (Sima Community Member), Yunus Monei (KPMA Waoha Tribe)	Birds of Paradise are used by Papuan communities as “natural signs” and there are still areas within PT SAP where these birds can be found. They should be considered HCV 6	Even though birds of Paradise have defined as HCV 1 they are also included as HCV 6 here.
Workshop (30 Aug 17)	All participants of HCV 6 discussion group	Since the company has been operating, no destruction of cultural sites of artifacts has occurred	No areas thus far impacted by company operations, but the Sago groves require clarification
Statement Letter (7 Sep 17)	Indigenous People (KPMA) – represent Wate Tribe from Wanggar Pantai Village	Community have agreed to open all smallholder area without reducing area, in accordance to HGU issued by the government. Community understand that some part of the smallholder has been identified as HCV. But community would like to plant oilpalm nonetheless. Request that HCV management areas to be removed from smallholder area.	<ul style="list-style-type: none"> - The assessors have already disseminated the results of the HCV identification, HCV Areas, threats and recommendation for management and monitoring including the maps for HCV - The assessor underscore that there are HCV areas within the planned plasma areas that have HGU issued for Cooperatives from Sima

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
			<p>Village and Wanggar Pantai Village, and acknowledge the objection/ concern that HCV area will reduce smallholder areas.</p> <ul style="list-style-type: none"> - PT SAP (and PT NB) needs to abide by the Goodhope sustainability policy and RSPO Principles and Criteria for management of HCV 1-4, and communicate this clearly to the sub-groups within the community that own Cooperatives - Assessor maintains HCV 1 -4 Mangement area that overlaps with smallholder area. - Assessor maintains HCV 5 and HCV 6 management area for <i>Dusun Sagu</i> in NB, except in SAP, under conditions that it is unnecessary for the management of HCV 1-4
Statement Letter (8 Sep 17)	Tribal Plantation Cooperative (Koperasi Perkebunan Masyarakat Adat, KPMA) – represent Akaba Tribe, Sima Village	<ul style="list-style-type: none"> - Community have agreed to open up all areas of plasma (smallholder) in accordance to the HGU issued. - Understand that a part of the Plasma area has been identified as HCV areas but still request that the area be cleared for oil palm. - Request for the HCV areas to be excluded from the plasma areas 	<ul style="list-style-type: none"> - The assessors have already disseminated the results of the HCV identification, HCV Areas, threats and recommendation for management and monitoiring including the maps for HCV - The assessor underscore that there are HCV areas within the planned plasma areas that have HGU issued for Cooperatives from Sima Village, and acknowledge villagers objection/concern that HCV area will reduce smallholder areas.
Statement Letter (8 Sep 17)	Indigenous People (KPMA) – represent Sarakwari Koroba Tribe, Sima Village	<ul style="list-style-type: none"> - Community agrees to open and clear all areas of the HGU issued for plasma without reducing area. - Informing the request that a proportion of the plasma area even though covered by HCV areas should be cleared and planted. - Request these HCV management areas to be removed from the plasma areas 	<ul style="list-style-type: none"> - PT SAP needs to abide by the Goodhope sustainability policy and RSPO Principles and Criteria for management of HCV 1-4, and communicate this clearly to the sub-groups within the community that own Cooperatives
Statement Letter (7 Sep 17)	Indigenous People (KPMA) – represent Waoha Tribe, Sima Village	<ul style="list-style-type: none"> - Community agrees to open and clear all areas of the HGU issued for plasma without reducing area. - Informing the request that a proportion of the plasma area even though covered by HCV areas should be cleared and planted. - Request these HCV management areas to be 	<ul style="list-style-type: none"> - Assessor maintains HCV 1-4 Mangement area that overlaps with smallholder area.

Date	Name (Organization/Expertise)	Concern and Recommendation	Assessor Response
		removed from the plasma areas	
Interview (16 Okt 17)	Enrico Kondologit (Anthropologist, Curator at Loka Budaya Museum – Cendrawasih University)	– Land in Nabire Regency belongs to tribes. Each tribe firmly uphold customary provision, especially in relation to land. Land is perceived as mother who gives them food and life	– Further discussion in sub-chapter on the description of wider landscape (Social Cultural values).
Interview (17 Okt 17)	Habel Samakori (Anthropologist, Research Coordinator (Seven Customary Territory in Papua and Papua Barat)	– Papua communities do not recognize the concept of land “buying and selling”, but “borrowing” under customary mechanism until the end of the project (either investor project or government project). After a project ends and the land is no longer in use, the land will be automatically returned to the tribe(s).	– Discussion in sub-chapter on HCV identification results.
Interview (18 Okt 17)	Windy Hapsari, Hari Suroso (Anthropologist, Researcher at Papua Archaeological Agency)	<ul style="list-style-type: none"> – <i>Dusun Sagu</i> is perceived as the mother of Yerisiam community – in their tradition, an area to be protected and restored. – The furthest reaches of Yerisiam territory are Aya Are River estuary (east), Wasoi River estuary (west), east of Ororodo Village, along the ridge to Erega Village in the east of Yumur Lake (north, coastline) – From 11 cultural heritage objects from Papua that currently awaits verification (to be classified as National Cultural Heritage), none are from Nabire Regency 	

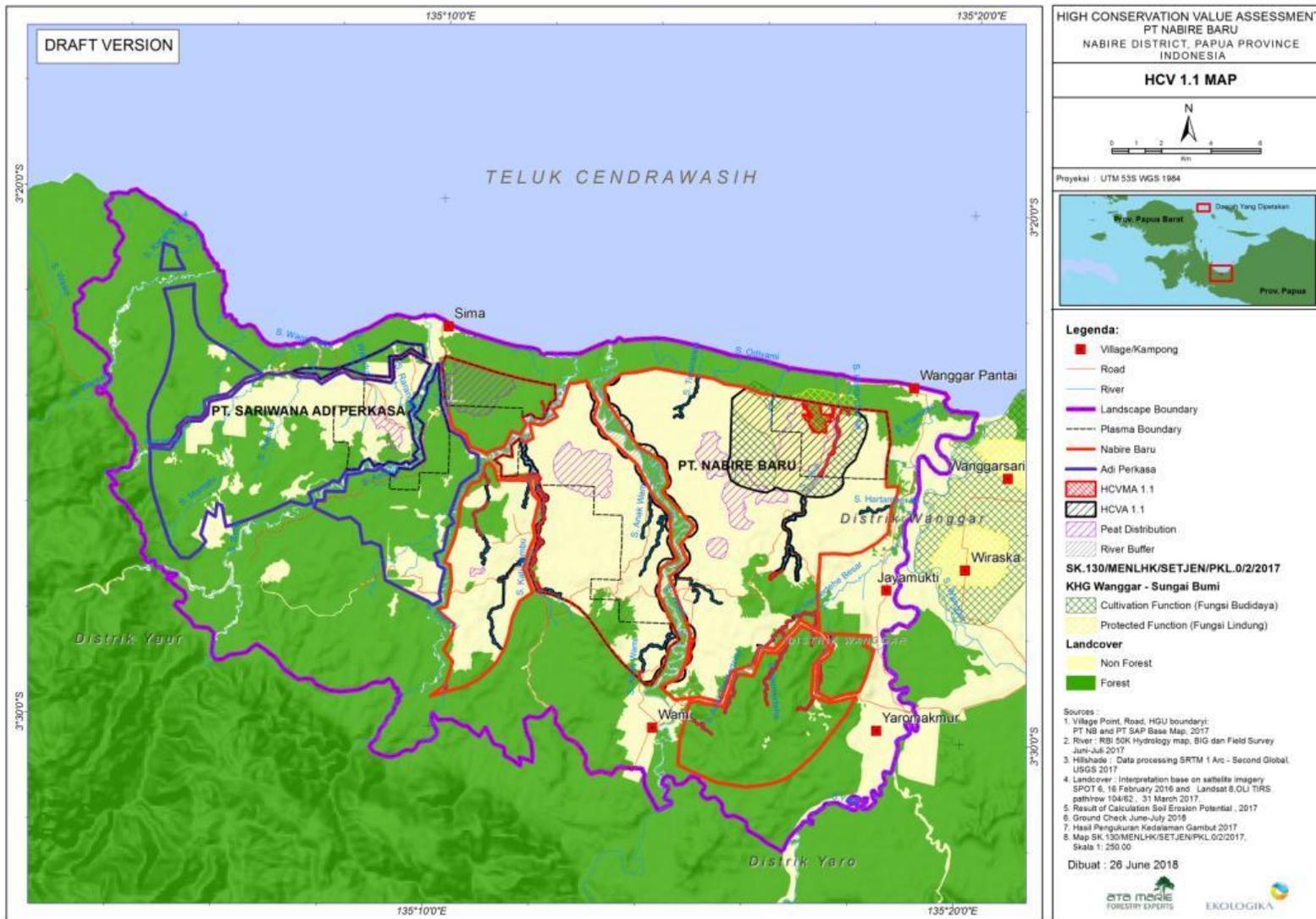


Figure 15. Map of HCVMA and HCVMA 1.1 in NB Assessment area and its Surrounding

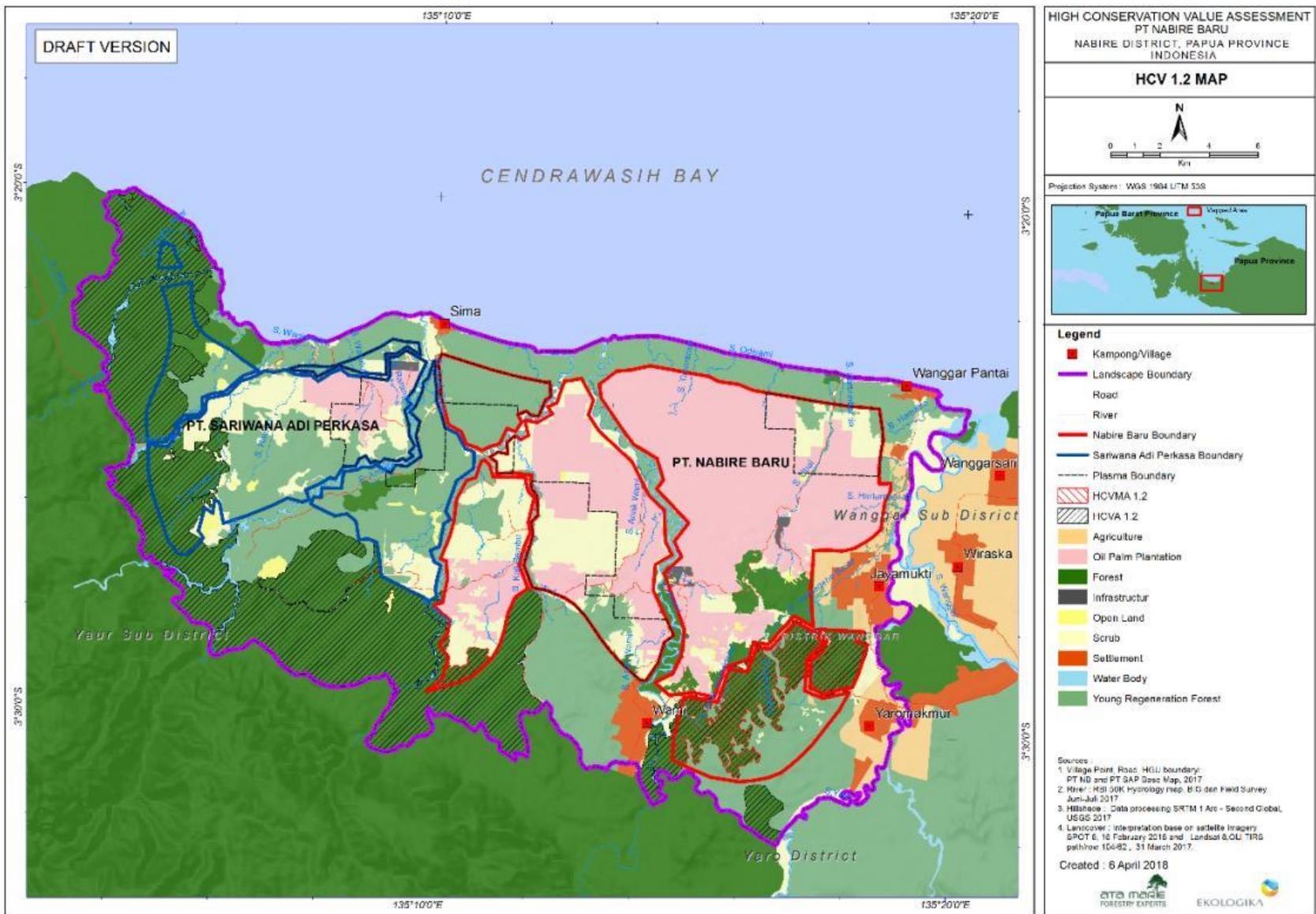


Figure 16. Map of HCV and HCVMA 1.2 in NB Assessment area and its Surrounding

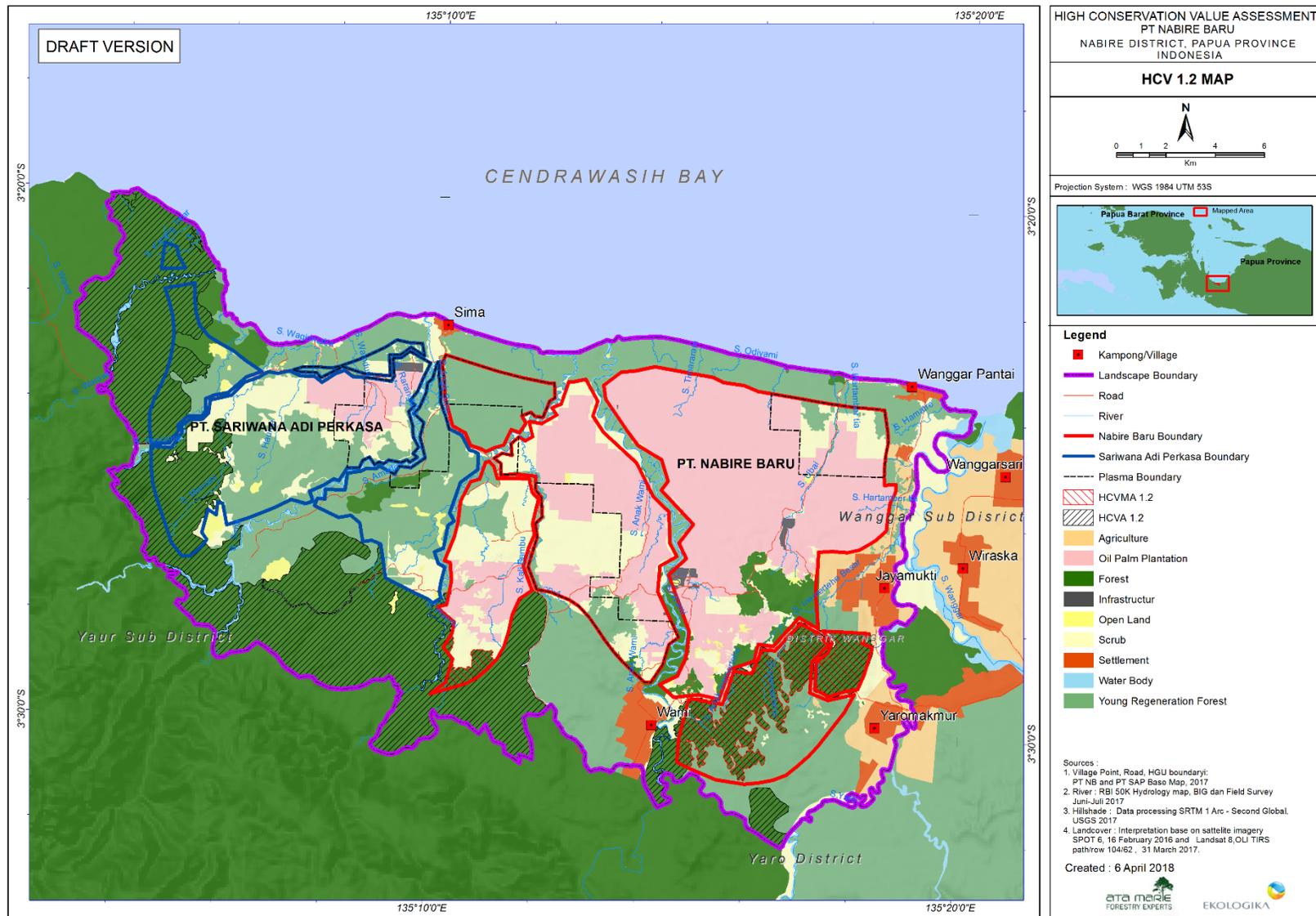


Figure 17. Map of HCV and HCVMA 1.3 in NB Assessment area and its Surrounding

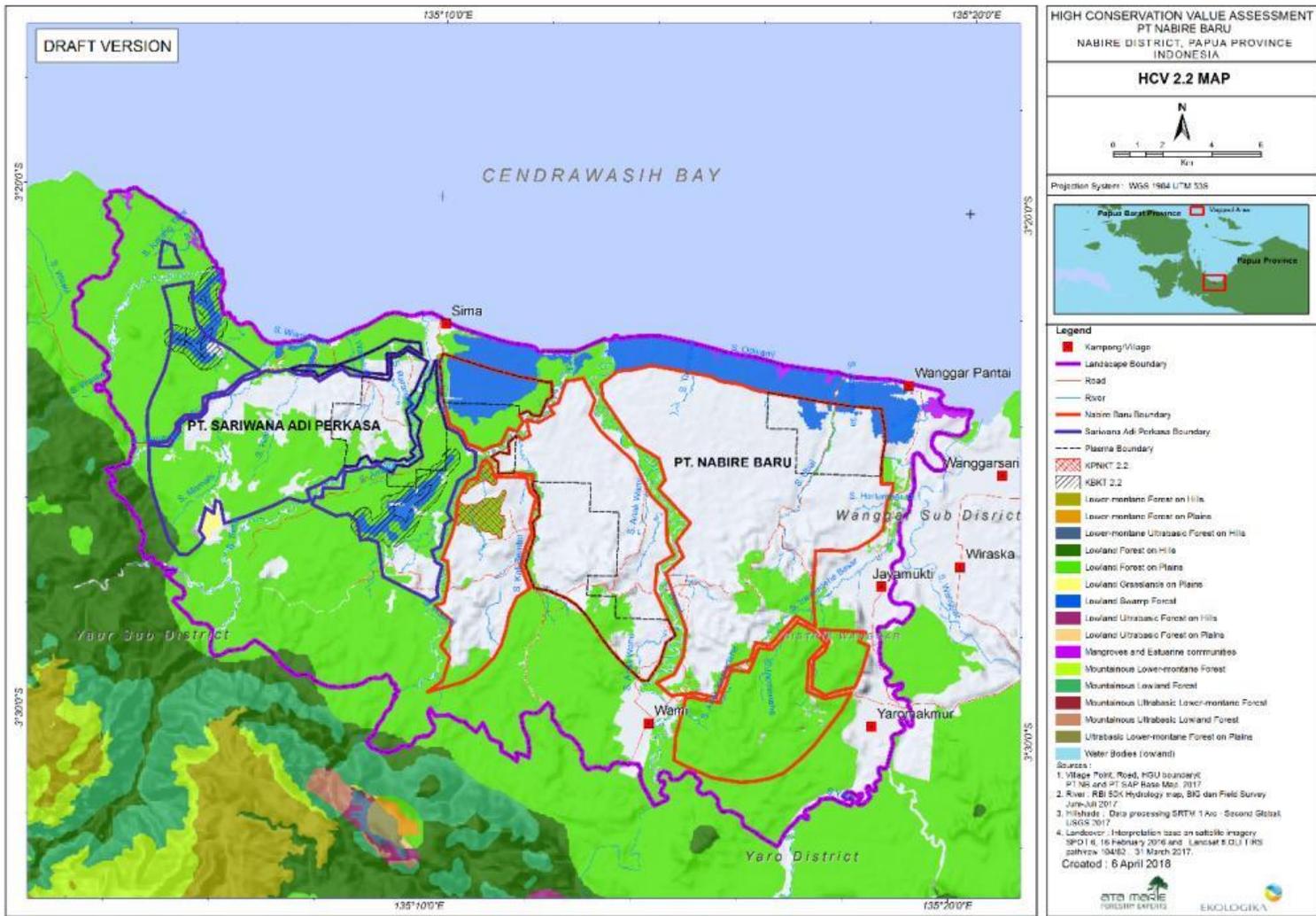


Figure 18. Map of HCV and HCVMA 2.2 in NB Assessment area and its Surrounding

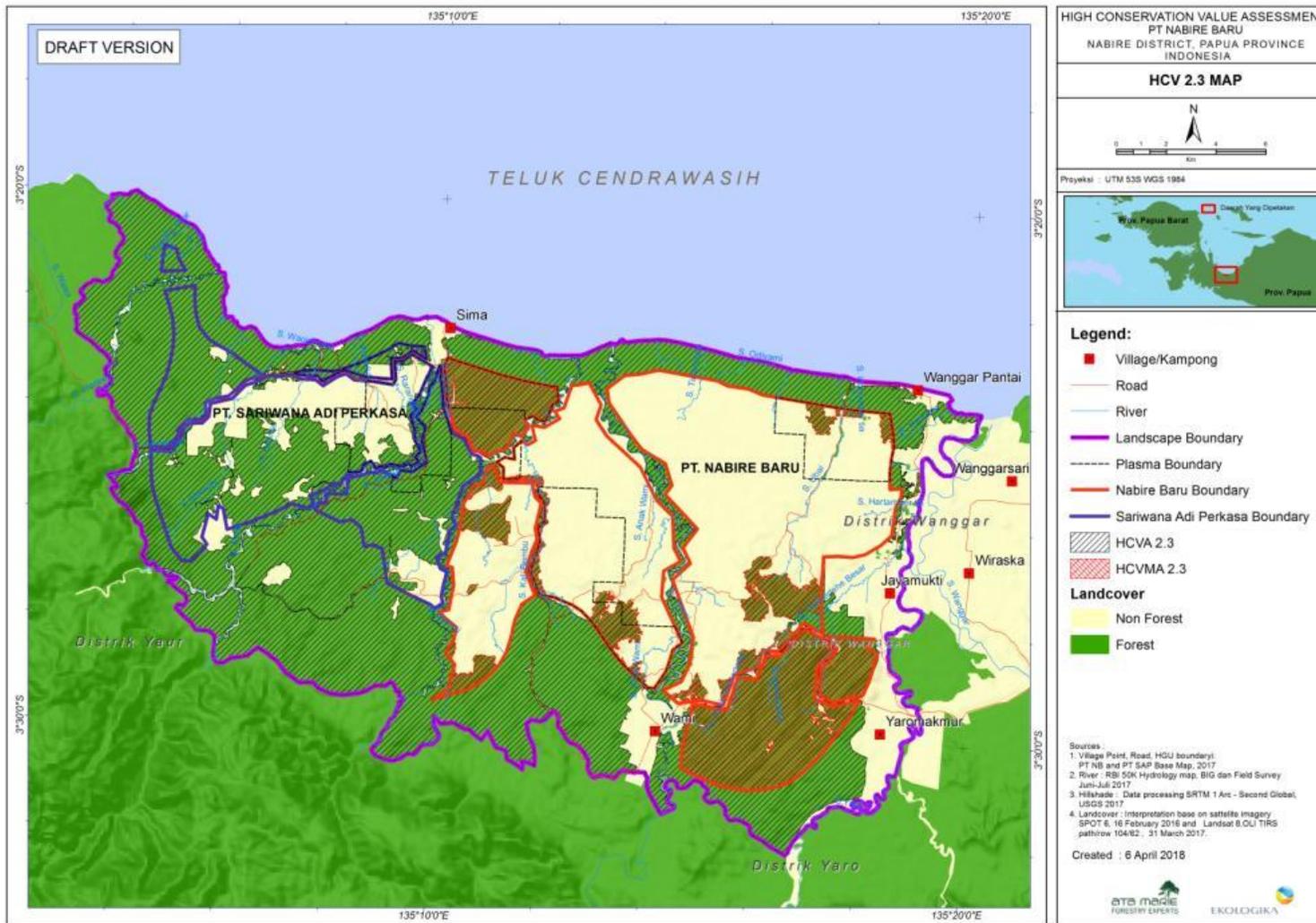


Figure 19. Map of HCV and HCVMA 2.3 in NB Assessment area and its Surrounding

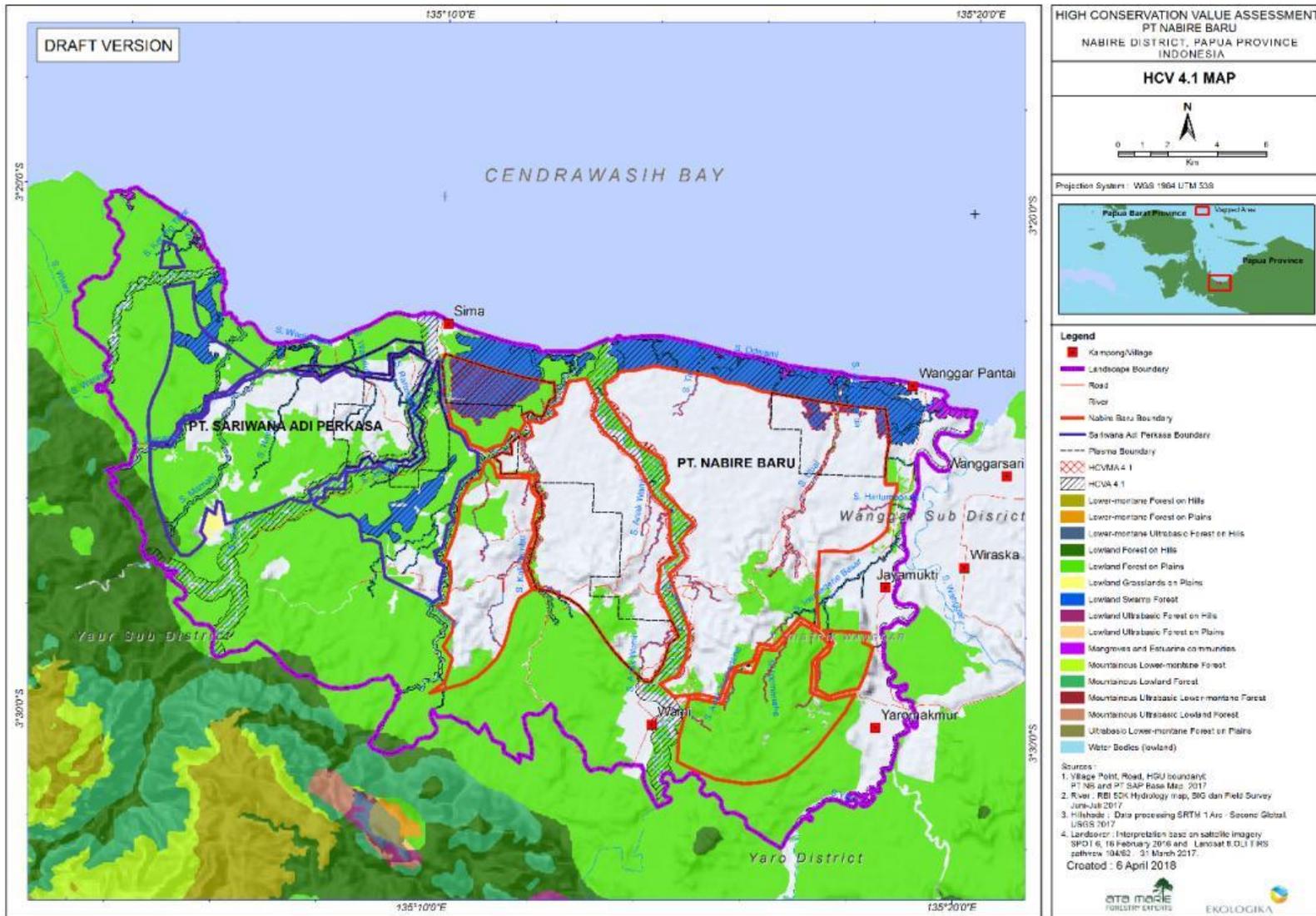


Figure 20. Map of HCV and HCVMA 4.1. in NB Assessment area and its Surrounding

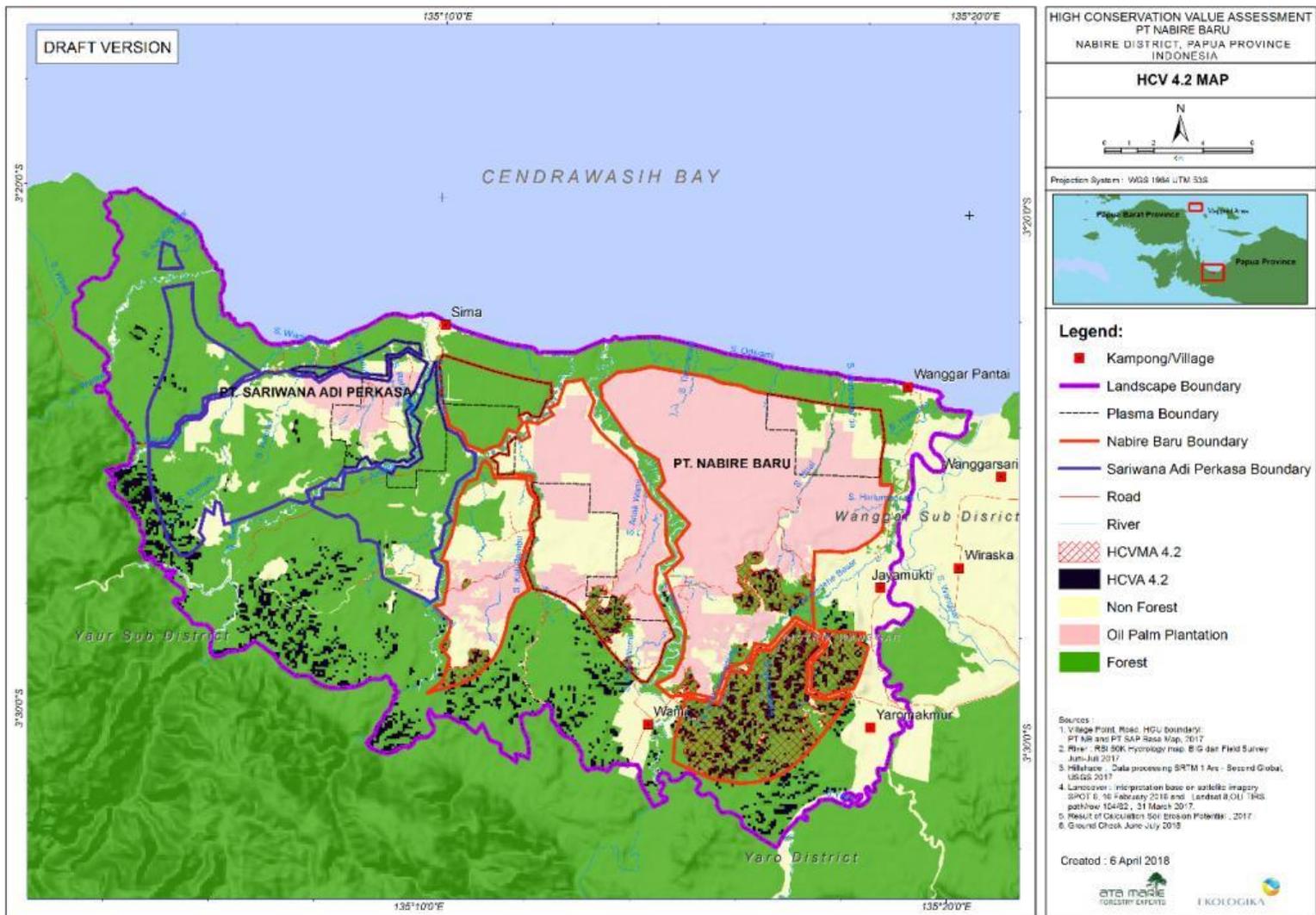


Figure 21. Map of HCVMA and HCVMA 4.2 in NB Assessment area and its Surrounding

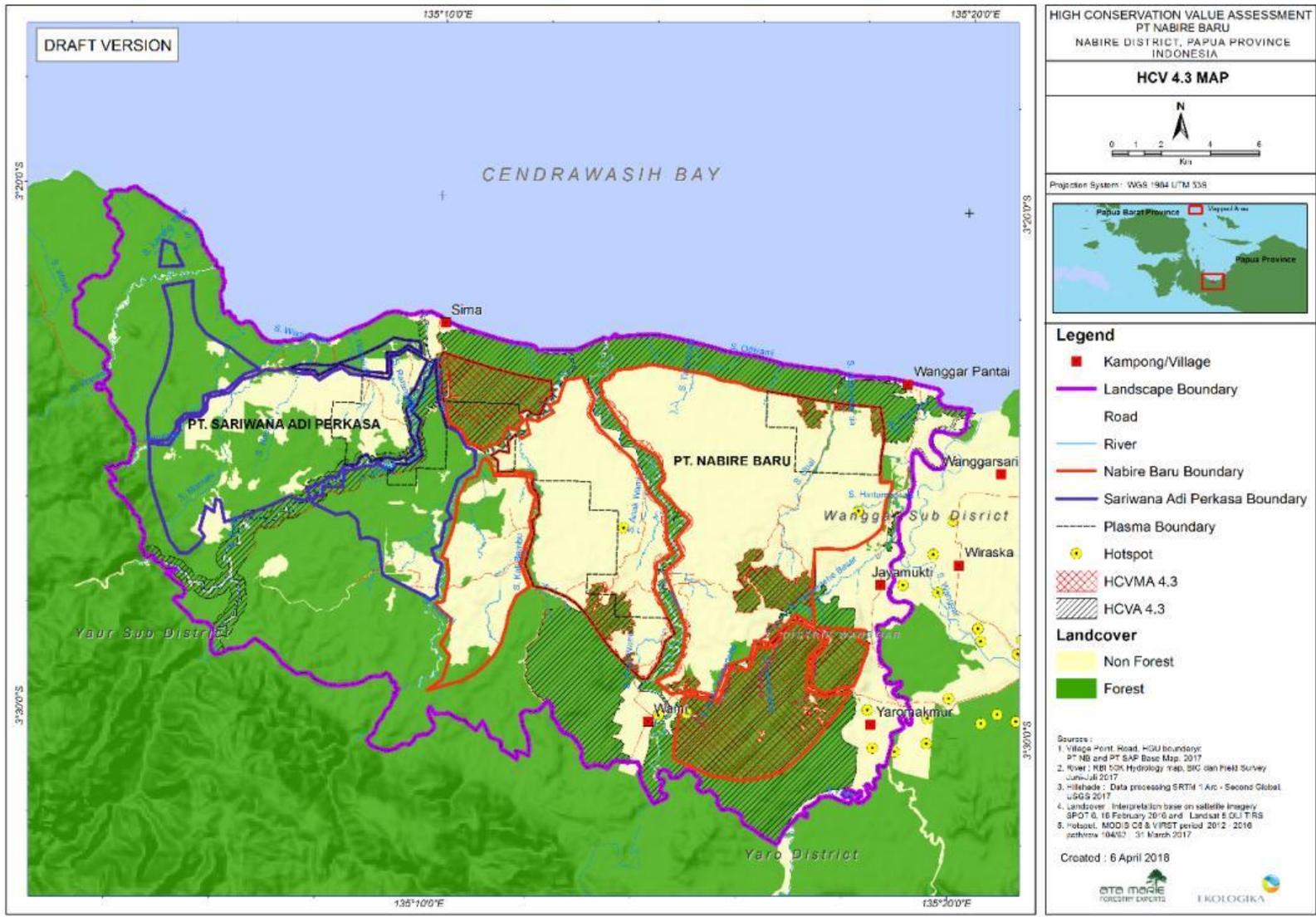


Figure 22. Map of HCV and HCVMA 4.3 in NB Assessment area and its Surrounding

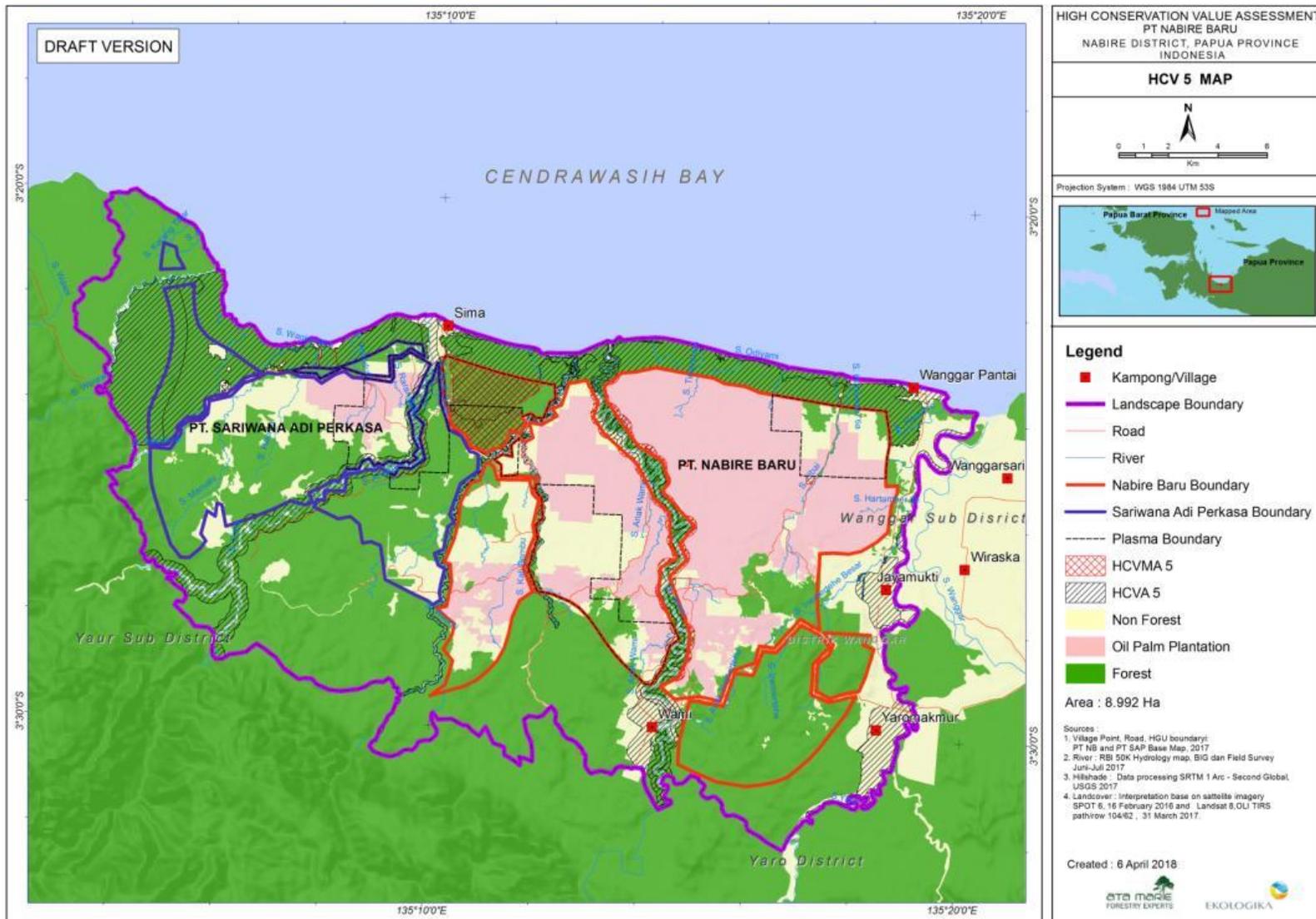


Figure 23. Map of HCVA and HCVMA 5 in NB Assessment area and its Surrounding

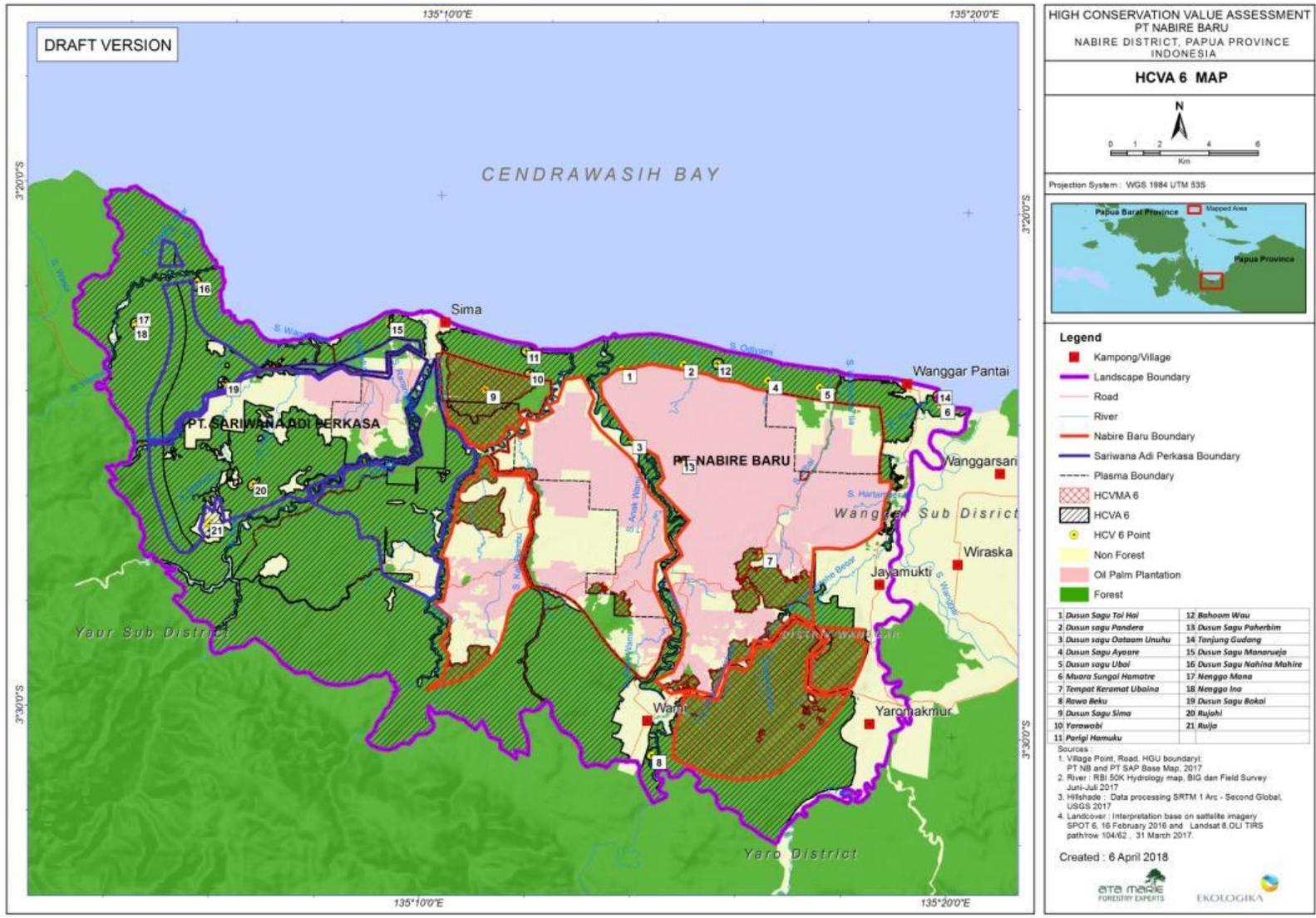


Figure 24. Map of HCVA and HCVMA 6 in NB Assessment area and its Surrounding

Table 32. Summary of HCVA in PT NB Assessment Area

HCV	Description	HCV A(ha)		
		Total HCVA inside ass. landscape	Total HCVA in Core HGU	Total HCVA in Small Holder
1.1	Peat Hidrological Unit (KHG S. Wanggar – S. Bumi)	1,406	782	624
	River Buffer	586	462	123
1.2	Forest (Lowland Swamp Forest Ecosystem)	10,233	1,460	0
1.3	Forest (Lowland Forest Ecosystem, Swamp Forest, Mangrove and Estuarine)	22,963	3,458	843
2.2	Ecotone (Swamp Forest and Lowland Forest Ecosystem)	833	0	0
2.3	Forest (Lowland Forest Ecosystem)	22,963	3,458	843
3	Grassland in Plains Ecosystem	52	0	0
	Mountainous Lowland Forest Ecosystem	3	0	0
	Mangrove and Estuarine Ecosystem	144	0	0
	Waterbodies/Lake	3	0	0
4.1	Forest	2,496	85	489
	Riverbanks	4,121	462	123
4.2	Potential TBE > 180 ton/ha/year	2,157	740	34
4.3	Forest (Swamp Forest and Lowland Forest Ecosystem)	10,612	3,001	773
5	Forest, River and <i>Dusun Sagu</i>	8,992	568	429
6	Importan Cultural Sites:			
	<i>Dusun</i> Paherbim	2	2	0
	<i>Dusun Sagu</i>	8	8	0
	<i>Dusun Sagu</i> Bokai	8	0	0
	<i>Dusun Sagu</i> Kampung Sima	446	85	362
	<i>Dusun Sagu</i> Manarueja	5	0	0
	<i>Dusun Sagu</i> Nahina Mahire	13	0	0
	<i>Dusun Sagu</i> Yarawobi	9	0	0
	Beku Swamp Cultural Site	15	0	0
	Sacred Sites:			
	Goa Nenggoina	1	0	0
	Goa Nenggomana	13	0	0
	Ruija	52	0	0
	Rujahi	14	0	0
	Sacred Springs Sima Village (Parigi Hamuku) and old sites of Hamuku Village	13	0	0
	Sungai busuk (Rarantiruma)**			
	Air Mabuk**	9		
	Anapireoonggre (in Yaur language)/ Babrauguapi (in Yerisiam language)**	1		
	Bahoom Wau*	13	0	0
	Hamatre (Aha Juha)*			
	Ubaina*			
	Tanjung Gudang*	6	0	0
	Goa Wamora*			
	Important Species			
	Bird of Paradise	21,437	3,442	0
	Sago (Metroxylon sagu)			

3.4. Soil and Topography

3.4.1. Topography

Based on Topography Map areal of PT NB almost the whole of the study area consists of level to gently undulating to rolling, hilly, somewhat steep and steep land (0-50%+ or 0-25°+ slopes). Landscape of PT NB concession is less than 317 metres above sea level. Based on the slope map of PT NB, the area of assessment flat to very steep, but most of the area (81,6%) of the landscape is flat (0-8%), and the others are: 14,31% Slope Class 8 – 15% (Rolling); 3,97% Slope Class 16-25% (Hilly); 0,57% Slope Class 26 – 40% (Steep); and 0,09% >40 (Very Steep).

Table 33. Slope Classes in This Report

Slope Classes		Description
(%)	(°)	
0-4	0-2	Level
4-12	2-6	Undulating
12-24	6-12	Rolling
24-38	12-20	Hilly
38-50	20-25	Somewhat Steep
50-60	25-30	Steep

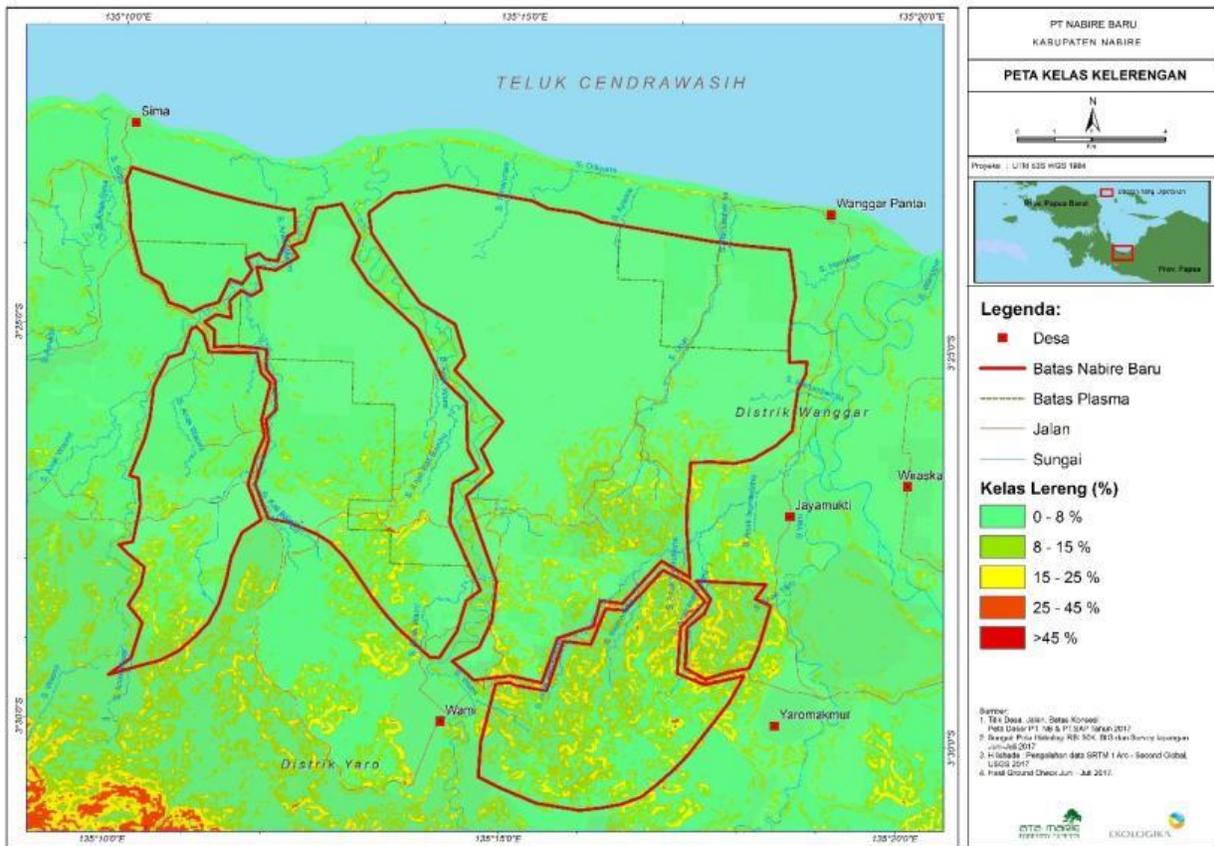


Figure 25. Topographic Map in PT Nabire Baru

3.4.2. Soil Type and Peat Land Identification

Based on the results of Soil studies conducted by companies (March 2017) and summarized in USDA Classification Land Classification; the soils in this area consist of ultisols, entisols, histosols and inceptisols. The dominant type of soil is ultisol with alluvium parent rock. This soil type is quite acidic, generally has a pH (4.2-4.8), red and yellow from the accumulation of iron oxide (carat) which is not very soluble in water. This type of soil has many nutrients such as calcium and potassium deficiency resulting in ultisol area cannot be used for permanent agriculture without the help of lime and other fertilizers such as superphosphates.

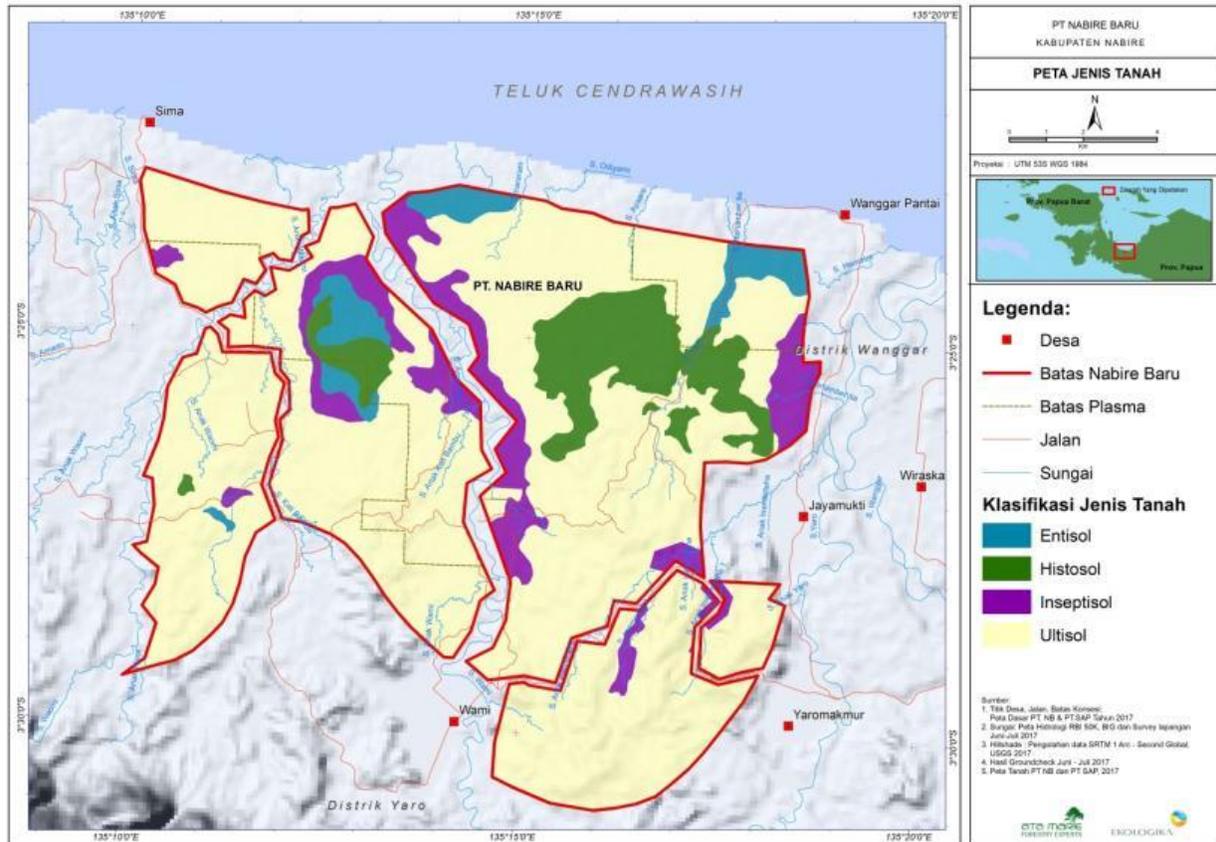


Figure 26. Soil map in PT Nabire Baru

Based on Peatland Hydrological Area map published by the Ministry of Environment and Forestry (Decree of the Minister of Environment Decree SK.130 / MENLHK / SETJEN / PKL.0 / 2/2017 on Stipulation of the National Peat Ecosystem Function Map) there is presence of an indicative peat Hydrological Unit in the location of HGU PT NB. It is part of Indicated Wanggar River-Bumi River Peat Hydrological Area (KHG/Kawasan Hidrologi Gambut). Indicated Wanggar River-Bumi River Peat Hydrological Unit (KHG.91.04.0422) is inside HGU PT NB, but current land cover for KHG is oil palm plantation. KHG is still indicative, which means its status should be verified in the field in accordance to chapter 5 to 8 Government Regulation no 71/2014 on Peat Ecosystem Protection and Management. Up to now, Wanggar River - Bumi River KHG is still unverified by the authorities, therefore, total area, location and zonation might be amended in the future.

The report “Soils of the PT Nabire Baru Estate” (March 2017) included ‘soil suitability evaluation for palm oil cultivation’ and states that based on soil map and evaluation of the area, almost the whole of the study area is potentially suitable for oil palm cultivation with the exception of steep slope. The results of the soil survey identified 11 ‘soil management groups’ in PT Nabire Baru HGU (10 mineral soil groups and one organic soil group). The report included best management practices recommended for each ‘soil management group’. The assessor acknowledged that these recommended practices are already being carried out but these can be further fine-tuned and monitored regularly.

The soil report identified organic soils of the following depths:

- 50-100 cm: 189.0 ha
- 100-150 cm: 212.6 ha
- 150-300 cm: 190.3 ha

Further sampling and analyses were completed in August 2017 by a second consultancy team as part of new HCV assessments. The results of the sampling identified sporadic areas of shallow peatland. There are no peat domes in the area. In total an estimated 1,183 Ha of peatland has been identified within PT Nabire Baru and PT Sariwana Adi Perkasa concessions. Most of this (1,152 Ha) is within PT Nabire Baru concession, located in six areas that have been delineated as peatland areas. 654 Ha has already been planted with oil palm. This soil was not determined as being peat prior to planting. Furthermore, the area was planted prior to the launch of Goodhope’s no development on peat policy and prior to the introduction of the more stringent RSPO principles and criteria (RSPO P&C 2018). Note that in RSPO P&C 2013 only peat of depth >3m was recognized as being prohibited for development.

Table 34. Peatland Areas in PT Nabire Baru

Land Cover	Non HCV	HCV	Total
YRF	-	343.20	343.20
Scrub	143.30	5.00	148.30
Palm Oil Plantation	654.00	-	654.00
Open Land	6.20	-	6.20
Sub Total	803.50	348.20	1,151.70

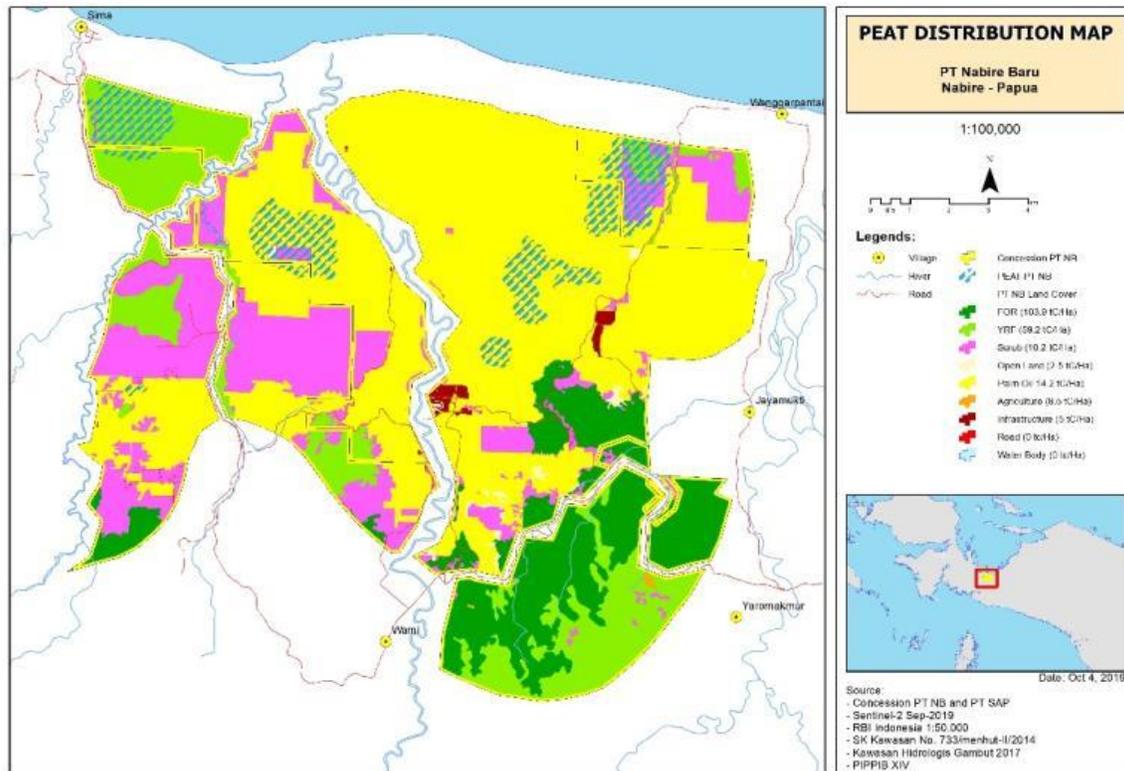


Figure 27. PT Nabire Baru Indicative Peat Distribution Map

3.5. Assessment of Carbon Stock and GHG Emissions

The GHG Assessment of PT NB and SAP states the estimated carbon stocks in the NB and SAP HGU areas, estimates the greenhouse gas emissions that will arise as a result of several scenarios for the development of oil palm plantations, and provides recommendations for low emission development scenarios. The report is intended to meet the standards of the RSPO NPP with the aim of minimizing greenhouse gas emissions.

3.5.1 Carbon Stock

Carbon stock in forest strata is estimated to be 103.9 tons/ha on mineral soils and 105.2 tons / ha on peat soil (Table 35).

Table 35. PT Nabire Baru Carbon Stocks by Land Cover and with extent of HCV and Peat

Land Cover	(Ton C/ ha)	Hectarage			Ton Carbon		
		Non HCV	HCV	Total	Non HCV	HCV	Total
Mineral Soil							
Forest	103.90	0.09	2,042.43	2,042.52	9.35	212,208.48	212,217.83
YRF	59.20	1.12	1,938.21	1,939.33	66.30	114,742.03	114,808.34
Scrub	10.70	2,353.15	156.45	2,509.60	25,178.71	1,674.02	26,852.72
Agriculture	8.50	8.85	0.18	9.03	75.24	1.53	76.77
Palm Oil Plantation	14.20	6,515.11	252.22	6,767.33	92,514.56	-3,581.52	96,096.09
Infrastructure	5.00	60.59	13.53	74.12	302.95	67.65	370.60
Road	-	17.40	4.78	22.18	-	-	-
Settlement	5.00	0.03	0.09	0.12	0.15	0.45	0.60
Water Body	-	-	5.25	5.25	-	-	-
Open Land	2.50	58.44	29.04	87.48	146.10	72.60	218.70
Sub Total		9,014.78	4,442.18	13,456.96	118,293.36	332,348.28	450,641.64
Peat Soil							
Forest	103.90	-	-	-	-	-	-
YRF	59.20	-	343.20	343.20	-	20,317.44	20,317.44
Scrub	10.70	-	148.35	148.35	-	1,587.35	1,587.35
Agriculture	8.50	-	-	-	-	-	-
Palm Oil Plantation	14.20	653.99	6.20	660.19	9,286.66	88.04	9,374.70
Infrastructure	5.00	-	-	-	-	-	-
Road	-	-	0.04	0.04	-	-	-
Settlement	5.00	-	-	-	-	-	-
Water Body	-	-	-	-	-	-	-
Open Land	2.50	-	-	-	-	-	-
Sub Total		653.99	497.79	1,151.78	9,286.66	21,992.83	31,279.48
Total		9,668.77	4,939.97	14,608.74	127,580.02	354,341.10	481,921.12

Soil Type	Hectarage	Carbon Stock (tonC)
Mineral Soil	13,457	451,031
Peat Soil	1,152	31,510
Total	14,609	482,541

Peat Soil			
Average Peat depth (cm)	Basic Density (gr/cm3)	%C	Carbon Stock/ Ha (tonC/ha)
125.9	0.2	51%	1,292

3.5.2. Scenarios Considered

For the purpose of estimating emissions, two scenarios are considered:

- 1) In Scenario A, conservation areas include HCV plus remaining forest land (forest & YRF) and all peatland. i.e. develop all available land except HCV, forest, YRF and peatland which has not been developed.
- 2) Scenario B is designed in accordance with the existing HCS report case where part of the forested land is opened to fulfill the agreed plasma commitments between the company and the community, especially the Sima villagers. i.e. develop as in Scenario A plus forest area (37 ha) and YRF (1,074 ha) which have been identified as HCS solution for Plasma Case Studies.

Scenario A has been selected for proposed new plantings in order to maintain compliance with NDPE Policy, in particular no development on HCV areas or HCS forest.

Table 36. Scenarios Considered for PT NB dan SAP Development

Scenario	Area for New Development		Area for Conservation
	Area (ha)	Description	
A	3,653	All available land except HCV, forest, YRF and peatland which has not been developed	HCV, forest, YRF and peatland which has not been developed
B	4,765	Same with scenario 3 plus forest area (37 ha) and YRF (1.074 ha) which have been identified as HCS solution for Plasma Case Studies	Same with scenario 3 plus forest area (37 ha) and YRF (1.074 ha) which have been identified as HCS solution for Plasma Case Studies

3.5.3. Emissions from Plantation Operations

Table 37. Projection of Total GHG Emission from New Planting Activities

No	Description	(tCO ₂ e)			tCO ₂ e/ha		
		Scenario			Scenario		
		A	B	All land cleared	A	B	All land cleared
1	Land clearing	5,586	15,480	105,677	1.53	3.25	8.20
2	Crop sequestration	-34,184	-44,582	-120,689	-9.36	-9.36	-9.36
3	Fertilisers	2,620	3,417	9,250	0.72	0.72	0.72
4	N ₂ O	3,489	4,119	12,689	0.96	0.86	0.98
5	Field fuel	830	1,082	2,930	0.23	0.23	0.23
6	Peat	0	0	48,155	0.00	0.00	3.74
7	Conservation credit	-21,783	-19,020	0	-5.97	-3.99	0.00
Total		-43,442	-39,504	58,011	-11.90	-8.30	4.50

Notes: Negative(-) means keep carbon stocks

3.5.4. Emissions from Mill Operations

Below table shows the emission value from Mill operations in each scenario. Assumption of FFB processed by Mill in each scenario includes FFB potential in proposed new planting area and the FFB produced in existing palm oil plantations.

Table 38. Projection of GHG Emissions from Mill Operations

No	Description	(tCO ₂ e)			tCO ₂ e/ha)		
		Scenario			Scenario		
		A	B	All land cleared	A	B	All land cleared
1	POME	61,481.80	67,577.95	112,196.98	16.84	14.19	8.70
2	Mill fuel	5,010.46	5,507.26	9,143.49	1.37	1.16	0.71
3	Purchased electricity	0.00	0.00	0.00	0.00	0.00	0.00
4	Credit (excess electricity exported)	0.00	0.00	0.00	0.00	0.00	0.00
5	Credit (sale of biomass for power)	0.00	0.00	0.00	0.00	0.00	0.00
Total		66,492.26	73,085.21	121,340.47	18.21	15.35	9.41

Notes: Negative(-) means keep carbon stocks

3.5.5. Final Development Map and GHG Emissions Projection Chart

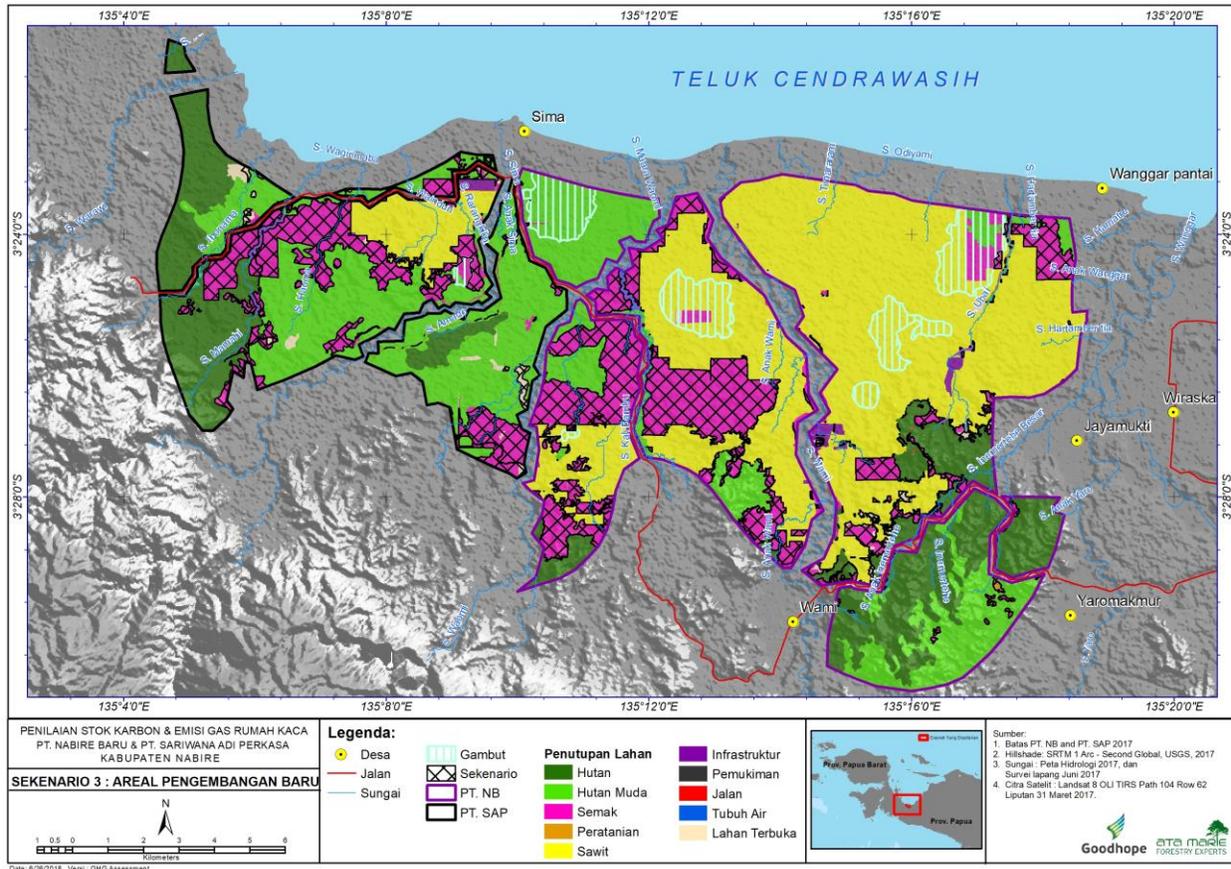


Figure 28. Final Development Map (Scenario A)

Table 39. GHG emissions projection chart

Field emissions & sinks (Assumes vigorous growth for oil palm - for use by large scale operations)			
	t CO ₂ e	t CO ₂ e/ha	t CO ₂ e/t FFB
Land clearing	5.586,01	1,53	0,05
Crop sequestration	-34.183,75	-9,36	-0,33
Fertilisers	2.619,82	0,72	0,03
N ₂ O	3.488,88	0,96	0,03
Field fuel	829,79	0,23	0,01
Peat	0,00	0,00	0,00
Conservation credit	-21.782,64	-5,97	-0,21
Total	-43.441,88	-11,90	-0,42
Mill emissions & credit			
	tCO ₂ e	t CO ₂ e/ha	tCO ₂ e/tFFB
POME	61.481,80	16,84	0,20
Mill fuel	5.010,46	1,37	0,02
Purchased electricity	0,00	0,00	0,00
Credit (excess electricity exported)	0,00	0,00	0,00
Credit (sale of biomass for power)	0,00	0,00	0,00
Total	66.492,26	18,21	0,21
Total emissions, tCO₂e (field and mill)			
	23050,38	6,31	-0,21

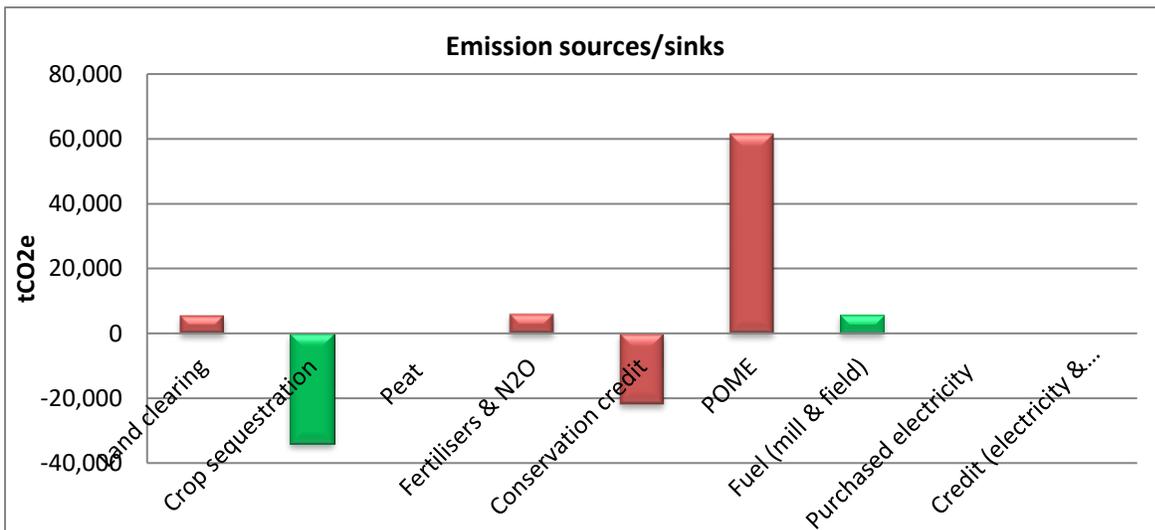


Figure 29. GHG emissions chart – Sources and Sinks

3.6 Community Engagement and FPIC

3.6.1. Community Engagement and FPIC Prior to Development

Prior to release of land, a process of consultation and consent seeking took place:

1. DPRD Nabire members and Customary Land Owner Representatives were invited on site visits to PT Agro Indomas (Goodhope Group mature plantation in Central Kalimantan) in 2009 and 2011.
2. Socialization of the proposed development was done formally in village level, and informally with each of sub tribes, and to other selected target groups. Discussion included opportunities and risk associated with plantation development and the proposed plasma partnership scheme.
3. Participatory mapping/land inventory was carried out with all sub-tribes.
4. Land ownership transfer was carried out through a process of land compensation and compensation for any planted crops.
5. Consent to land release was signed by heads of sub tribes and individual land owners.
6. Price agreement is documented in written agreements.
7. A list of planned compensation payments was placed on announcement boards for the whole community to see and check who was entitled for land compensation and how much.
8. Entitled parties came to claim the land compensation as per agreed and announced.

3.6.2. Community Engagement and FPIC Regarding ICLUP Following New HCV Assessment and HCS Assessment

The key objectives of the community engagement activities were as follows:

- To share information about the HCS and HCV assessment processes with communities.
- To seek community consent and participation for planned HCS and HCV assessment related activities.
- To seek information and knowledge on current and future land use at community level as input into preparation of the HCV, HCS and Integrated Conservation and Land-Use Plan (ICLUP).
- To seek community informed consent to the final draft boundaries of conservation areas.

3.6.2.1. Participatory Mapping

Land use and land tenure systems were analysed during participatory mapping as well as FGDs to meet the objectives of both HCV and HCS Assessments. Objectives include description of land ownership structure, and identification and mapping of community land use and cultural sites (HCV 5 and 6). Mapping was primarily carried out with Wanggar and Sima communities as these are the two land owner villages. A large part of the participatory mapping effort was in identification of sago areas.

3.6.2.2. Summary of Community Engagement Findings Regarding Land Use

The land tenure system at Sima and Wanggar is communal. Land tenure maps developed from participatory surveys during land release negotiations by the Company are available and were vetted by the LINKS team (see the LINKS FPIC Gap Analysis Study in Sharepoint).

The major types of land use identified are sago collection, timber cutting, fishing, hunting and gathering of various other non-timber forest products. Smallholder agriculture activity is very small scale and located outside concession boundaries.

The final “FGD FPIC” were held at each village between 20-25 August between the HCV/HCS teams and Communities. The objective was to present and discuss the findings of the HCV, HCS, and participatory mapping surveys carried out during the initial site visit. Large scale maps of the draft land use plan were displayed, and Community members invited to check and add comments as desired during the discussions. Additional input was also received during the two-day final stakeholder consultation meeting held on 30-31 August in Nabire. There is a clear need to find a solution to the as yet unresolved issue of community requests for continued development of plasma areas.

3.6.2.3. Key points from the FGD FPIC at Village Level

Sima: Community accepted the HCV 1-6 and HCS areas identified during participatory mapping although some small changes were made to HCV 5 (some additional sago patches were identified during the meeting). Key points coming from the meeting:

1. It was agreed that all sago areas will be included in HCV 5 and conserved.
2. Apart from sago areas, communities requested that all plasma areas be developed including forested areas (Note this request does not align with results of HCV 1-4 or HCS assessments).

Wanggar: Community accepted the HCV 1-6 and HCS areas identified during participatory mapping. Key points coming from the meeting:

1. Communities requested that all plasma areas be developed including forested areas (Note again as at Sima, this request does not align with results of HCV 1-4 or HCS assessments)
2. Communities requested any plasma land that needs to be conserved (due to HCV/HCS/peat) should be replaced elsewhere.

3.6.2.4. Key Points from the Final Stakeholder Consultation Meeting

Many community members raised concerns about uncontrolled logging and gold mining impacting on their environment. Although community members admitted they were often employed in these activities, they were not the drivers. Community members frequently mentioned a lack of effective planning, control and monitoring from relevant government agencies, and “co-operation” between local businessmen and individuals in the agencies.

The importance of implementing a participatory approach to environmental management and monitoring was mentioned. Some attendees said many community members do not understand the requirement for environmental management, and also were not aware of the exact location of boundaries (Concession boundaries, plasma area boundaries, conservation area boundaries etc).

Participatory management will both educate as well as enable better implementation of management plans.

3.6.3 Addressing Stakeholder Concerns

Continued efforts have been made to improve levels of mutual understanding and repair relations between the company and local communities. In particular, the company has worked to address main concerns that were raised by Yayasan Pusaka on behalf of the indigenous Yerisiam Gua community. These include the following key issues: i. development without a collective decision-making process or consent given by local communities; ii. land disputes; iii. destruction of Sago groves; iv. violence by state security forces; v. deforestation implicated with flooding.

From March 2017 until July 2018 the resolution process was supported by the Conflict Resolution Unit (CRU) of the IBCSD (Indonesian Business Council For Sustainable Development) under the framework of the RSPO Dispute Settlement Facility (DSF).

In July-August 2018, the Dispute Resolution Agreement was negotiated and agreed by representatives from the company and local communities. The signed agreement was notarized by Nabire Regency government officials on 9th August 2018.

In accordance with the obligations of the Dispute Resolution Agreement (August 2018), negotiations have resulted in the development of a Memorandum of Understanding for community engagement and empowerment. The Memorandum of Understanding: Corporate Social Responsibility (CSR) PT Nabire Baru (NB) was signed by representatives from company and community on 17th January 2019.

4. SUMMARY OF MANAGEMENT PLANS

Goodhope commits to carry out management and monitoring activities in accordance with the Group's Sustainability Policy and RSPO Principles and Criteria.

4.1. Team Responsible for Developing Management Plans

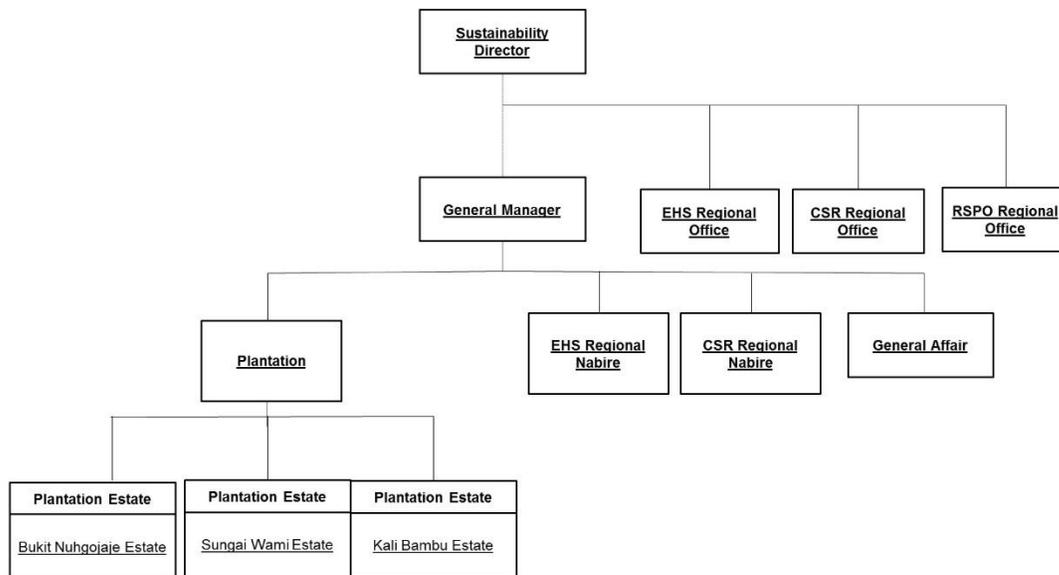


Figure 30. Personnel involved in planning and implementation of New Planting Procedure in PT Nabire Baru

4.2. Stakeholders to be involved

Stakeholders are parties who give or receive influence from existence oil palm plantation in PT NB. The parties referred to in this study focused on key stakeholder, are parties directly, significant and interactive and give each other a sustainability stakeholder.

The company has been carrying out a public consultation which it held on June 2017, August 2017, and February 2018 involved community, local government who live in the neighborhood concession HGU company. The villages that follow the public consultation that village on and around Yaur District and Yaro District, Nabire Regency, Papua.

Below is the list of participants of stakeholder consultation (not limited to, but including):

a. Organisation and Local Community Representative/Tribes:

1. Kampung Sima
2. Kampung Wanggar Pantai
3. Desa Wami
4. Desa Jaya Mukti
5. Desa Yaro Makmur
6. Suku Wate Asiaina
7. Suku Besar Yerisiam Goa - Sub Suku Sarakwari, Akaba, Koroba, Waoha

b. Government Organisation:

1. Kecamatan Yaur
2. Kecamatan Yaro
3. Badan Konservasi Sumber Daya Alam Kab. Nabire
4. Badan Lingkungan Hidup Daerah (BLHD) Kab. Nabire
5. Badan Pertanahan Nasional Kab. Nabire
6. Dinas Pertanian Tanaman Pangan dan Peternakan Kab. Nabire
7. Dinas Perkebunan Kab Nabire
8. Dinas Perikanan dan Kelautan Kab. Nabire
9. Bappeda Kab Nabire - Kepala Bidang Data, Penelitian dan Pengembangan, dan Statistik
10. Dinas Pekerjaan Umum Kab. Nabire
11. Badan Pemberdayaan Masyarakat dan Pemerintahan Kampung Kab. Nabire
12. Dinas Koperasi dan UKM Kabupaten Nabire
13. Badan Penanggulangan Bencana Daerah Kabupaten Nabire
14. Taman Nasional Teluk Cendrawasih

c. Non Government Organisation:

1. Keuskupan Timika
2. Klasis GKI Paniai
3. Klasis Gereja Pantekosta
4. Dewan Adat Papua Kabupaten Nabire
5. WALHI Papua
6. KASIH Papua
7. PRIMARY
8. KOMPAK
9. Universitas Satya Wiyata Mandala
10. Yayasan Pusaka

d. Company and Plasma Cooperative (Mitra Koperasi Plasma:

1. PT Jati Dharma Indah
2. KPMA Wate Asiaina
3. KPMA Waoha
4. KPMA Akaba
5. KPMA Sarakwari dan Koroba

4.3. Summary of Social and Environmental Management Plan

Management of negative impacts is carried out in accordance with the mitigation negative impact hierarchy, namely: (1) Avoid, namely by trying to prevent negative impacts; (2) Reduce, namely by trying to reduce the potential negative impacts that can occur; (3) Repair, which is by trying to correct the negative impact

Recommendations on the management of key issues that can be undertaken by the management unit are as follows:

- Cooperate with local government of Nabire district in an effort to improve the quality of human resources in the local area, especially health and education.
- Cooperate with the local government of Nabire district as well as service providers in basic infrastructure development that can support the lives of affected communities.
- Cooperate with the local government of Nabire district and other related parties in poverty alleviation efforts.
- Cooperate with the local government of Nabire district and also the village government in an effort to strengthen the capacity of the village government apparatus and support the improvement of the quality of the administrative services of the village administration.
- Cooperate with the local government of Nabire district, particularly the Regional Disaster Management Agency (BPBD), and other relevant parties and local communities in disaster risk management efforts in the local area.
- Cooperate with local government of Nabire district, customary institution, and TNI / Polri in law enforcement in local area.
- Encourage the presence of relevant multi-stakeholder forums in local area landscape management.
- Cooperate with local governments of Nabire districts, customary institutions, religious institutions (church clans, MUI, etc.) and other stakeholders for strengthening cultural and religious practices for communities in the local area.
- Cooperate with the local government of Nabire district and other concerned parties to undertake the development and strengthening of the capacity of social organizations such as community business cooperatives, youth organizations, women's organizations and so on.
- Develop feedback and complaints handling mechanisms.
- Facilitate the process of arranging agreements between the management unit and the community
- Develop and implement a participatory monitoring plan with indicators to monitor changes over time. Conduct periodic evaluations and reviews and adaptive management.

Table 40. Recommendation for Negative Impacts Management

No	Impacts	Activities act as impact source	Impact Management
1	Potential reduced access to the production of customary land such as sago, hunting, timber, rattan, etc.	Land Clearing	Providing support to the community to access production sources in other areas Strengthening community knowledge and capacity on replacement nutrition sources such as cultivation /

No	Impacts	Activities act as impact source	Impact Management
			livestock
2	Potential conflicts arise due to differences in the amount of compensation received by each community member / KPMA.	Land Provision	Encourage the application of transparent land sharing compensation mechanisms to KPMA management and tribal and sub-tribal leaders Socialization to KPMA members together with KPMA management
3	Increase in the number of disease sufferers caused by mosquitoes as disease vectors	Land Preparation	Conducting disease prevention efforts caused by mosquito vectors Conduct monitoring of public health conditions and prepare health care support if needed
4	Potential disruption to the source of clean water	Land clearing	Conducting sustainable water management efforts by involving the community Monitoring the community's water supply and preparing clean water support if needed
5	Potential loss of nutrients due to reduced location of hunting	Land clearing	Conducting management of important areas for the community (HCV 5) Strengthening community knowledge and capacity on replacement nutrition sources such as cultivation / livestock
6	Potential loss of local food sources due to land clearing activities	Land clearing	Conducting management of important areas for the community (HCV 5) Strengthening community knowledge and capacity on replacement food sources such as cultivation
7	Reduced sago reserves belonging to communities due to land clearing errors	Land clearing	Monitoring of land clearing activities in accordance with the planning Replacement of damaged sago tree
8	Potential conflicts between the board and members of KPMA as well as between KPMA members (the public) and the company due to the limited understanding of KPMA members to business processes, including operational costs to cooperatives and the	Partnership	Strengthening the capacity and knowledge of the board and members of the community about the plantation business process Maximize grievance and conflict resolution mechanisms

No	Impacts	Activities act as impact source	Impact Management
	distribution of plasma output.		
9	KPMA management is not working well	Partnership	Capacity building and knowledge of KPMA management on an ongoing basis Monitoring of KPMA management periodically
10	Potential of river water pollution that can decrease the quality of river water and disruption of water biota life due to the use of fertilizers and pesticides	Nurseries	Apply the appropriate pattern of fertilizer and pesticide usage Monitoring the environmental impacts of rivers and other water sources
11	Potential occurrence of landslide disaster due to soil erosion in the process of planting oil palm on hilly areas	Planting	Prevent landslide prevention in hilly areas Perform periodic monitoring of hilly areas especially during the rainy season
12	A potential declining in productivity of oil palm crops due to massive pest attacks due to the planting of homogeneous plant species (palm)	Planting	Perform pest and disease management regularly Conduct regular monitoring of the condition of oil palm trees
13	Potential health problems due to increased dust content due to mobilization of operational vehicle plantations	Planting	Perform periodic road watering Conduct public health monitoring and prepare health care support if needed
14	Potential disruption of community mobility due to road damage due to mobilization of operational vehicle plantations	Planting	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
15	river water pollution that can decrease the quality of river water and disruption of water biota life due to the use of fertilizers and pesticides	Maintenance	Apply the appropriate pattern of fertilizer and pesticide usage Monitoring the environmental impacts of rivers and other water sources
16	Potential reduced water discharge that can disrupt public water supply due to water use	Maintenance	Conducting sustainable water management efforts by involving the community Monitoring the community's water supply and preparing clean water support if needed
17	Potential health problems during maintenance activities	Maintenance	Apply the appropriate pattern of fertilizer and pesticide usage

No	Impacts	Activities act as impact source	Impact Management
	due to the use of chemical fertilizers and pesticides		Conduct public health monitoring and prepare health care support if needed
18	Potential Health problems due to increased dust content due to mobilization of operational vehicle plantations	Maintenance	Perform periodic road watering Conduct public health monitoring and prepare health care support if needed
19	Potential disruption of community mobility due to road damage due to vehicle mobilization plantation operations	Maintenance	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
20	The emergence of potential conflicts between indigenous peoples and migrant workers	Maintenance	Strengthening Capacity and work patterns of the community in order to compete with migrant communities Maximize grievance and conflict resolution mechanisms
21	Potential health problems due to increased dust and noise content due to mobilization of plantation operations	Harvesting	Perform periodic watering of the road Conduct public health monitoring and prepare health care support if needed
22	Potential disruption of community mobility due to road damage due to mobilization of plantation operations	Harvesting	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
23	The emergence of potential conflicts between indigenous peoples and migrant workers	Development of Palm Oil Mill	Strengthening Capacity and work patterns of the community in order to compete with migrant communities Maximize grievance and conflict resolution mechanisms
24	Potential health problems due to increased dust and noise content due to mobilization of operational vehicle of plantation	Development of Palm Oil Mill	Perform periodic road watering activities Conduct public health monitoring and prepare health care support if needed
25	Potential disruption of community mobility due to road damage due to mobilization of plantation operations	Development of Palm Oil Mill	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
26	Potential health problems	Development of	Implementation of waste

No	Impacts	Activities act as impact source	Impact Management
	arising from air pollution and noise due to the activity of palm oil mill machinery	Palm Oil Mill	management and factory pollution well Conduct public health monitoring and prepare health care support if needed
27	Potential health problems caused by environmental pollution from oil palm machine activity	Palm Fruits Processing	Implementation of waste management and factory pollution well Conduct public health monitoring and prepare health care support if needed
28	Potential health problems due to increased dust and noise content due to mobilization of plantation operations	Palm Fruits Processing	Perform periodic road watering activities Conduct public health monitoring and prepare health care support if needed
29	Potential disruption of community mobility due to road damage due to mobilization of plantation operations	Palm Fruits Processing	Improving the quality of plantation roads so as not to be easily damaged Conduct monitoring of road conditions and repairs in case of damage
30	Potential conflict arising between indigenous peoples and migrant workers	Palm Fruits Processing	Strengthening Capacity and work patterns of the community in order to compete with migrant communities Maximize grievance and conflict resolution mechanisms
31	Potential reduction in income of KPMA members due to reduced plasma area due to reduction of areas that support the existence of HCV and HCS	Environmental management	Re-negotiating with indigenous peoples and preparing plasma replacement mechanisms Maximize grievance and conflict resolution mechanisms
32	A reduce in potential of public food sources due to the imposition of legal sanctions for illegal activities of hunting for protected species	Environmental management	Providing community support for access to other hunting areas Strengthening community knowledge and capacity on replacement nutrition sources such as cultivation / livestock

Table 41. Social and Environmental Management Plan

Program	Activity	Strategy	Time Plan
Resolving land tenure related to customary right around company area	Problem solving disagreements communal land development plan for oil palm plantations	<ul style="list-style-type: none"> Held a customary meeting of all the sub-tribes in tribe Yeresiam 	2018-2020
	Inventory land ownership around the village areas	<ul style="list-style-type: none"> Build communication involving heads of tribes, sub-tribes, village officials, community leaders and law enforcement agencies in solving the problem of customary rights Enclave on the location-the location that does not allow for open palm plantation (settlement, forest sago, sago tree, sacred areas) 	2018-2020
Build communication and network with all related stakeholders of PT. Sariwana Adi Perkasa	Regular meeting with all stakeholders	<ul style="list-style-type: none"> Develop a routine meeting schedule Determine a topic of each meeting Documentation of meeting result Follow up the meeting result 	Start from 2018
	Socialization with customary right tribe	<ul style="list-style-type: none"> Conduct regular meetings, especially with the chiefs, heads of sub-tribes, village officials, community leaders and land owners 	2018
Improve the educational quality of society	Develop a plan to improving an educational aspect from kindergarten to Senior High School	<ul style="list-style-type: none"> Using educational consultant Cooperation and communication with Educational Agency of Nabire 	Start from 2020
	Provide the auxiliary teacher	<ul style="list-style-type: none"> Provide the auxiliary teacher for teaching in the Sima Village 	Start from 2020
	Provide the scholarship	<ul style="list-style-type: none"> Develop a detail plan related to scholarship scheme Conduct a selection process with related stakeholder 	Start from 2018
Improve the health quality of society	Conducting studies on issues and health problems in Sima Village	<ul style="list-style-type: none"> In cooperation with the Health Agency of Nabire Optimizing the company's health officer 	2018
	Conduct a counseling, health checks and treatment to communities	<ul style="list-style-type: none"> Determine the counseling materials most needed by the community Conduct activities in cooperation with local health office 	Start From 2018
Economic Empowerment of	Conduct Potential Economic Analysist	<ul style="list-style-type: none"> Focus group discussion with local community for identifying potential economic that can be 	2018

Program	Activity	Strategy	Time Plan
Society		<ul style="list-style-type: none"> developed Conduct a study involving a consultant related to community economic development 	
	Develop a demonstration plot of annual food crops	<ul style="list-style-type: none"> Preparation of Organizational and Institutional in the community level Conduct a training related to annual food crops cultivation. Continuous mentoring related to annual food crops cultivation 	2018-2022
	Counseling and training in order to create business opportunities and alternative livelihoods	<ul style="list-style-type: none"> Continuous mentoring Conduct a training for entrepreneurship Facilitation of capital and business equipment Ongoing mentoring activities both in terms of production and marketing 	2018-2022
	Develop a small holder scheme	<ul style="list-style-type: none"> Conduct intensive meetings to disseminate information about the scheme of plasma cooperation especially with respect to area, the rules and requirements necessary Conduct a meeting with the community to create a plasma participatory planning Involving the community, traditional leaders and village government in the plasma program development 	2018-2022
Environmental Improvement Program	Campaigning, training and dissemination of 3R (Reduce-Reuse-Recycle) to the community	<ul style="list-style-type: none"> Cooperating with professional consultants in the 3R implementation Creating productive goods as a result of activities 3 R. 	Start from 2018
	Management / conservation of ground water	<ul style="list-style-type: none"> Fresh water monitoring, especially in the dry season Conduct a ground water conservation training to the company staff and local community 	Each year, start from 2018
	Reduction of river water pollution	<ul style="list-style-type: none"> Conduct training on a regular basis to the waste management officer Regular training of waste treatment Improvement the quality of waste treatment technology Monitoring the quality of river water periodically 	Each year, start from 2018
Accessibility and	Facilitating the repair and construct of roads and	a. Make a road in the company area that can improve a	2012

Program	Activity	Strategy	Time Plan
public facilities Improvement Program	bridges	connection between villages b. Maintaining road quality together with local community	
	Supporting electricity program	<ul style="list-style-type: none"> • Cooperation with third party to search and implementing alternative electricity sources • Socialization to the community related to electricity program 	2018-2023

4.4. Summary of HCV-HCS Management and Monitoring Plan

Our integrated Management and Monitoring Plan has been developed to incorporate the important principles of the HCV approach and HCS Approach. The plan sets out objectives and targets to mitigate threats according to the results and recommendations from assessments. This includes commitments to:

1. Maintain and if possible, improve HCVs in the management area by addressing the threats against HCVs, in particular to protect rare, threatened and endangered species and safeguard rare ecosystems.
2. Prevent deforestation or degradation of High Carbon Stock forest.
3. Prohibit any new development on peatland, regardless of peat depth.
4. Implement Best Management Practices for the development and management of oil palm plantations with minimal environmental impacts, e.g. to protect from the effects of soil erosion and sedimentation to safeguard watersheds and minimise the risks of flooding.
5. Ensure local and indigenous communities have sustainable access to basic needs and cultural values and that their rights are fully respected.

Management and monitoring will be implemented in a collaborative manner through engagement with key stakeholders including government institutions NGOs and local communities.

The major risk to HCV and HCS forest areas in PT NB is forest degradation due to continued uncontrolled logging for timber production. The site is located in an area that was previously Permanent Production Forest. Some of the timber / timber companies that have been operating in this region include PT Nabire Raya (1982-1986), PT Cedco (1987-1991), PT Pakarti Yoga (1992-1997), PT Barito Pacific, and PT Kaibus (1992- 1997). Logging company concessions all ended by 2001 but illegal logging continues.

The second risk identified is from clearing of land for smallholder agriculture. Fire is traditionally used by communities to open up land during the dry season. NASA hotspot data 2012-2016 revealed that small scale fires have occurred inside PT NB area - most fires were in the vicinity of villages. Interviews and field observation show that area surrounding concession area never suffered from large scale fire.

Table 42. The important principles of the HCV approach.

Principles	Description ^{6 7}
Legality and safeguards of land tenure rights, customary rights and consent	Land use right can be demonstrated and are not questioned by local community who hold tenurial right. Land use or land management should not reduce customary rights of local community, indigenous people, or other land users, without free, prior, informed consent. A good land management should be based on proper economic planning to ensure the prosperity of community who depends on the land. Free prior informed consent (FPIC) covers the rights of indigenous people or local community to give, hold or withdraw their agreement on activities that may be detrimental to their rights.
Wider landscape approach	The influence of management unit may reach areas outside concession. Some HCV management areas are designed to preserve a HCV both inside concession and in area outside concession that might be influenced by management unit in a wider landscape.

⁶ 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.

⁷ Brown, E. and M.J.M. Senior. 2014 (September). Common guidance for the Management and Monitoring of High Conservation Values. HCV Resource Network.

	<p>Management unit has a responsibility to be involved with other management unit of nearest areas and related stakeholders to coordinate for management plan and initiatives for the wider landscape. Organization is responsible to avoid HCV destruction beyond their concession area and to take into account activities occurred outside their area. If possible, they should involve surrounding stakeholders to help solving HCV management problems.</p>
<p>Precautionary approach</p>	<p>If there is a credible and sensible indication of an HCV, management unit should always assume that the HCV is present. They should make an appropriate decision to manage and monitor the HCV. "Precautionary approach demands that if information available shows that management activities will cause severe or irreversible damage to the environment and/or threaten human welfare, organization will take explicit and effective measures to prevent the damage and risks, even when the scientific information is incomplete or inconclusive, and when the vulnerability and sensitivity of values are uncertain" (FSC 2012b5).</p>
<p>Participatory and Transparent</p>	<p>Stakeholder involvement and consultation with experts are necessary, especially if production scale and intensity or external threat against HCV are considered high. Consult with people who know the area well (researcher, government specialist, NGO, and other relevant stakeholders) to obtain new knowledge. Build consensus on management strategy to solve conflicts.</p>

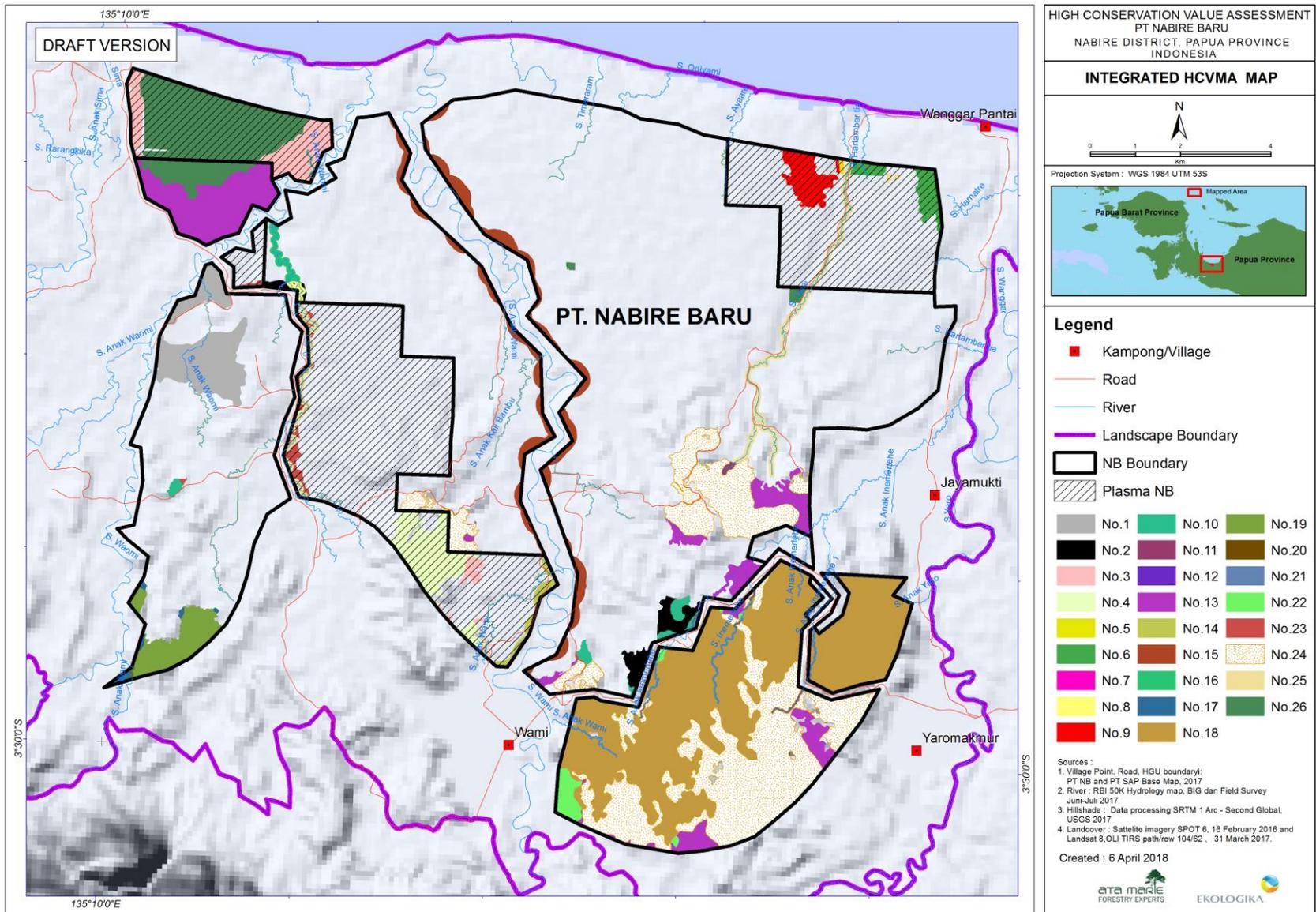


Figure 31. Map of integrated HCV Management

Table 43. Integrated Management Strategy in PT Nabire Baru

No	Integrated Management Strategy	Smallholder	Core	Total
1	Management area for RTE wildlife and vegetation, ecotone, naturally occurred representative species, flood control and culturally important species A (HCV 1.3, HCV 2.2, HCV 2.3, HCV 4.1, HCV 6)		220 ha	220 ha
2	Management area for RTE wildlife and vegetation, naturally occurred representative species and culturally important species (HCV 1.3, HCV 2.3, HCV 6)		57 ha	57 ha
3	Management area for RTE wildlife and vegetation, naturally occurred representative species and natural fire barrier (HCV 1.3, HCV 2.3, HCV 4.3)	150 ha		150 ha
4	Management area for RTE wildlife and vegetation, naturally occurred representative species, erosion prevention and natural fire barrier (HCV 1.3, HCV 2.3, HCV 4.2)	146 ha		146 ha
5	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control (HCV 1.3, HCV 2.3, HCV 4.1)	5 ha		5 ha
6	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control and natural fire barrier (HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.3)	124 ha		124 ha
7	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control and natural fire barrier and culturally important species (HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.3, HCV 6)		5 ha	5 ha
8	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control and culturally important species (HCV 1.3, HCV 2.3, HCV 4.1, HCV 6)		7 ha	7 ha
9	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control, erosion prevention and culturally important species (HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.2, HCV 6)		36 ha	36 ha
10	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control, erosion prevention, natural fire barrier and culturally important species (HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.2, HCV 4.3, HCV 6)		13 ha	13 ha
11	Management area for RTE wildlife and vegetation, naturally occurred representative species, flood control and culturally important species (HCV 1.3, HCV 2.3, HCV 4.1, HCV 6)		1 ha	1 ha
12	Management area for RTE wildlife and vegetation, naturally occurred representative species, natural fire barrier and culturally important species (HCV 1.3, HCV 2.3, HCV 4.3, HCV 6)		410 ha	410 ha
13	Management area for flood control and natural fire barrier (HCV 4.1, HCV 4.3)	28 ha		28 ha
14	Management area for flood control dan natural fire barrier and protein source (fish) (HCV 4.1, HCV 4.3, HCV 6)		224 ha	224 ha
15	Management area for flood control and protein source (fish) (HCV 4.1, HCV 5)		22 ha	22 ha

No	Integrated Management Strategy	Smallholder	Core	Total
16	Management area for CR species (Black spotted Cuscus), RTE wildlife and vegetation, naturally occurred representative species and culturally important species (HCV 1.2, HCV 1.3, HCV 2.3, HCV 6)		13 ha	13 ha
17	Management area for CR species (Black spotted Cuscus), RTE wildlife and vegetation, naturally occurred representative species, erosion prevention, natural fire barrier and culturally important species (HCV 1.2, HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.3, HCV 6)		1,230 ha	1,230 ha
18	Management area for CR species (Black spotted Cuscus), RTE wildlife and vegetation, naturally occurred representative species, erosion prevention and culturally important species (HCV 1.2, HCV 1.3, HCV 2.3, HCV 4.2, HCV 6)		119 ha	119 ha
19	Management area for CR species (Black spotted Cuscus), RTE wildlife and vegetation, naturally occurred representative species, flood control, and culturally important species (HCV 1.2, HCV 1.3, HCV 2.3, HCV 4.1, HCV 6)		1 ha	1 ha
20	Management area for CR species (Black spotted Cuscus), RTE wildlife and vegetation, naturally occurred representative species, flood control, erosion prevention, natural fire barrier and culturally important species (HCV 1.2, HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.2, HCV 4.3, HCV 6)		25 ha	25 ha
21	Management area for CR species (Black spotted Cuscus), RTE wildlife and vegetation, naturally occurred representative species, flood control, natural fire barrier and culturally important species (HCV 1.2, HCV 1.3, HCV 2.3, HCV 4.1, HCV 4.3, HCV 6)		44 ha	44 ha
22	Management area for RTE wildlife and vegetation, naturally occurred representative species, (HCV 1.3, HCV 2.3)	25 ha	1 ha	26
23	Management area for RTE wildlife and vegetation, naturally occurred representative species, erosion prevention, natural fire barrier and culturally important species (HCV 1.3, HCV 2.3, HCV 4.3, HCV 6)		1,110 ha	1,110 ha
24	Management area for riverbanks (HCV 4.1)	93 ha	144 ha	237 ha
25	Management area for Cultural sites (HCV 6)	356 ha	95 ha	451 ha
	Total	926.86 ha	3,776 ha	4,703 ha

Table 44. Internal threat identification and management for HCV in PT NB

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
HCV 1.1 Biodiversity for protected or conservation area	<p>Forest in Wanggar R – Bumi River Peat Hidrological Unit inside HGU</p> <p>Forest in River Protected Area inside HGU</p>	<ul style="list-style-type: none"> - Low understanding among staffs on the function of protected areas. 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting forest within assessment area into plantation area (policy) - Establishment of protected area inside HGU - Protected areas for HCV are marked with stone border marker instead of road or ditch, and information boards are installed - Develop SOP for land clearing and infrastructure construction to avoid disrupting peat protection function.
HCV 1.2 Critically Endangered Species (IUCN red list - CR)	<p>Mammals Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>)</p>	<ul style="list-style-type: none"> - HCV 1.2 Species hunting by company staff - Low understanding about protected wildlife - Access or access improvement that encourages hunting - Opening of block roads 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting lowland forest in the southern area into plantation area - Establishment of protected area for HCV 1.2 inside concession area. - Protected areas for HCV 1.2 are marked with stone border marker instead of road or ditch, and information boards are installed. - Awareness campaign for staffs, day laborers, and contractor on the existence and the importance of HCV 1-3 wildlife, vegetation, habitat and ecosystem - Provide handbook/pocket book and information boards contains pictures and general description of HCV 1.2 spesies - Hunting prohibition for staffs, day laborer and contractor, accompanied by sanctions for the perpetrators. - Develop SOP for land clearing and maintenance operations conducted near HCV 1.2 protected area to avoid disrupting HCV 1.2 spesies - Road planning and construction should not create fragmentation on forest to protect HCV 1.2 as the habitat for HCV 1.2 spesies. - No constructing of roads near HCV 1.2 protected area

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Vegetation: <i>Flindersia pimenteliana</i> (Rutaceae) (EN), <i>Intsia bijuga</i> , <i>Pterocarpus indicus</i> (Fabaceae), <i>Myristica subalulata</i> (Myristicaceae) (VU), <i>Anisoptera thrurifera polyandra</i> (Dipterocarpaceae)(VU), and <i>Aquilaria filaria</i> (Thymelaeaceae) (Appendix.II).	<ul style="list-style-type: none"> - Staff and contractor's lack of understanding about HCV 1.3 species - Access or access improvement that disrupt habitat - Timber demand for infrastructure 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting the remaining intact forest within assessment and HGU area - Establishment of protected area for HCV 1.3 - Ensure the SOP for land clearing near HCV 1.3 protected areas. - Protected areas for HCV 1.3 are marked with stone border marker, and information boards are installed. - Coordination with contractor on activities that might have impacts on forest and HCV 1.3 species (RTE) - Road access planning to minimize access to HCVMA 1.3 - Close and reroute infrastructure (road, ditch, mill) which caused habitat fragmentation for HCV 1.3 species - Ensure that timber based infrastructure do not use HCV 1.3 species - Ensure SOP with contractor that prohibit the use of HCV 1.3 timber species
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Mammals: Familia Phalangeridae; <i>Spilocus rufoniger</i> , <i>Spilocus maculatus</i> , <i>Phalanger intercastellanus</i> , Familia Macropodidae; <i>Dorcopsis muelleri</i>	<ul style="list-style-type: none"> - Hunting - Low understanding about protected or rare wildlife - Access or access improvement that encourage hunting 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting the remaining intact forest within assessment and HGU area - Establishment of protected area for HCV 1.3, - Ensure land clearing SOP in ara near HCV 1.3 protected area. - Protected areas for HCV 1-3 are marked with stone border marker instead of road or ditch, and information boards are installed. - Coordination with contractor on activities that might have impacts on forest and HCV 1.3 species (RTE) - Road access planning to minimize access to HCVMA 1.3 - Close and reroute infrastructure (road, ditch, mill) which caused habitat fragmentation for HCV 1.3 species - Awareness campaign for staffs, day laborers,

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
			<p>and contractors on the existence and the importance of HCV 1.3 species</p> <ul style="list-style-type: none"> - Provide handbook/pocket book and information boards contains pictures and general description HCV 1.3 species - Hunting prohibition of HCV 1.3 species for staffs, day laborers and contractors, accompanied by sanctions for the perpetrators.
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	30 avian species	<ul style="list-style-type: none"> - Low understanding about protected or rare wildlife - Access or access improvement that encourage hunting - Opening of block roads 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting the remaining intact forest within assessment and HGU area - Establishment of protected area for HCV 1.3, and provide clear restriction/boundary on area which will be opened - Hunting prohibition of HCV 1.3 species for staffs, day laborers and contractors, accompanied by sanctions for the perpetrators. - Provide handbook/pocket book and information boards contains pictures and general description HCV species - Provide information board on HCV species, and legal sanction against hunting of protected species in HCVA and HCVMA. - Road access planning to minimize access to HCVMA.
HCV 2.2 Areas that Contain Two or More Contiguous Ecosystems	Landscapes that contain intact ecotones between lowland swamp forest and lowland forest	<ul style="list-style-type: none"> - Fragmentation of forest ecosystem because of infrastructure construction (roads, ditches, and building) - Low understanding on the importance of ecosystem 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting the remaining intact forest within assessment and HGU area - SOP on land clearing and infrastructure construction to avoid HCV 2.2 zone - Awareness campaign for staffs, day laborers, and contractors on the existence and the importance of HCV 2.2
2.3 Areas that Contain Representative Populations of Most Naturally Occurring	All eagles, hornbill, Pigeons, Lories and Cockatoo, Cassowary, Bird of Paradise, <i>Lao-lao</i>	<ul style="list-style-type: none"> - Fragmentation of forest ecosystem - Lack of understanding on ecosystem among company staff 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area by not converting the remaining intact forest within assessment and HGU area - Establishment of protected areas in remaining

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
Species			<p>forest inside concession with clear boundary to differentiate with land that will be cleared.</p> <ul style="list-style-type: none"> – Ensure the implementation of SOP in land clearing to avoid HCV 2.3 zone. <p>Provide handbook/pocket book and information boards contains pictures and general description of HCV 2.3 and HCV 2.3 indicator species</p>
HCV 3. Rare, threatened, or endangered ecosystems, habitats or refugia.	Rare ecosystem: Lowland Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes (no management area)	<ul style="list-style-type: none"> – Fragmentation of forest ecosystem – Lack of understanding on rare and endangered among company staff 	<ul style="list-style-type: none"> – Create SOP which regulate land clearing and operational activities near HCV A 3 – Ensure the implementation of SOP on land clearing and infrastructure to avoid HCV 3 protected area. – Provide handbook/pocket book and information boards contains pictures and general description of HCV 3 – Awareness campaign for staffs and contractor on HCV 3
HCV 4.1. Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	Waterbodies and riverbank, swamp forest ecosystem, mangroves and estuarine ecosystem	<ul style="list-style-type: none"> – Clearing of riverbank for oil palm plantation – Construct road and other infrastructure by filling the river – Lack of information on river position – Ditch construction that alter river flow. – Washing spray equipment in the river – Liquid Waste discharge into river (later when factory is built) – Lack of understanding on ecosystem service among company staff 	<ul style="list-style-type: none"> – Affirmation and protection of HCV Area and not converting forest within assessment area into plantation area – Practicing Best Management Practices for land clearing around protected areas – Practicing Best Management Practices for road and infrastructure construction related to river – Repairing altered river courses – Mapping all rivers and tributaries (up to order 2-3) and re-measuring riparian zones – Ensure the implementation of SOP on washing boundary of spray equipment (drainage into river) and give sanctions for perpetrators. – Ensure the implementation of SOP on waste management – Awareness campaign for staffs and contractors on ecosystem service functions – Provide handbook/pocket book and information boards contains pictures and general description of HCV 4.1
HCV 4.2 Areas Important for the	Hilly area with TBE value > 180 ton/ha/year	<ul style="list-style-type: none"> – Land clearing and oil palm planting in riverbank 	<ul style="list-style-type: none"> – Affirmation and protection of HCV Area and not converting forest within assessment area

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
Prevention of Erosion and Sedimentation		<ul style="list-style-type: none"> - Land clearing in hill slope - Area with TBE 180/ton/ha/year - Road construction through hills - Lack of understanding on forest function in preventing erosion riverbank sedimentation among UM staffs 	<p>into plantation area</p> <ul style="list-style-type: none"> - Practicing Best Management Practices for land clearing and oil palm plantation in area with erosion potential <180 ton/ha/year - Practicing mechanic and vegetative land conservation techniques - Ensure the implementation of SOP on LCC planting and management - Avoid planting oil palm in slope area or area with TBE<180 ton/ha/year - Provide handbook/pocket book and information boards contains pictures and general description of HCV 4.2 - Awareness campaign for staffs and contractors on forest fuctions in preventing erosion and sedimentation
HCV 4.3 Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Lowland forest, swamp forest, Wami River, Yaro River, and Wanggar River and their riverbank	<ul style="list-style-type: none"> - Forest clearing for oil plam planting - Forest clearing for infrastructure construction - Lack of understanding on forest function as fire barred among UM staffs 	<ul style="list-style-type: none"> - Affirmation and protection of HCV Area and not converting forest within assessment area into plantation area - Practicing Best Management Practices for land clearing around protected areas - Ensure the implementation of SOP on infrastructure construction - Participatory patrol in HCVMA in forest and upstream area to control illegal logging - Provide handbook/pocket book and information boards contains pictures and general description of HCV 4.3 - Awareness campaign for staffs and contractors on ecosystem service as natural fire barrier
HCV 5 Carbohydrate Source	Natural and cultivated sago, tubers (betatas, ubi jalar, singkong, sukun hutan)	Land Conversion Conflicted HCV management	<ul style="list-style-type: none"> - SOP to ensure the protect existence of food source, in this case natural and cultivated sago, and agricultural land from oil palm plantation - SOP to prohibit the conversion of sago area and agricultural land into oil palm plantation - Awareness campaign on food security, to ensure the existence of land for natural and cultivated sago, and agricultural land, to fulfill carbohydrate needs.
HCV 5 Protein Source	- Freshwater fish: <i>Ikan gabus, lele,</i>	- Migration of fish and non-fish protein source	- Permit for local community to enter

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
	<p><i>bethik, tawes, gurami, nila, belut, udang, kepiting</i></p> <ul style="list-style-type: none"> – Brackish water fish; <i>bolana/belanak</i> (mullet fish), <i>somasi</i> (bass), <i>kakap putih</i> (baramundi), <i>kakap merah</i> (mangrove jack) – Saltwater fish; <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako,</i> – <i>Non-fish</i>: belut, udang, kepiting, soa-soa, ular, buaya, kerang/bia, ulat kayu bakau, kelelawar 	<p>due to habitat loss following the construction of oilpalm plantation.</p> <ul style="list-style-type: none"> – Access to protein source to harvest and use them sustainably is blocked 	<p>operational area and fishing to fulfill protein needs</p> <ul style="list-style-type: none"> – HCV management strategies or action should ensure the right and access of local community to protein source – Harmonization of management strategies: general management of HCV – limitation on utilization or harvesting.
HCV 5 Fresh water for drinking and cooking	Wells (groundwater)	<ul style="list-style-type: none"> – Construction activities and plantation operation is water catchment area – No buffer between oil palm tree and springs. – Potential contamination from fertilizer residue, herbicide, pesticide and rodenticide near water catchment area 	<ul style="list-style-type: none"> – Mapping of groundwater potential in concession area – Prohibit the expansion of plantation/business activities in groundwater/spring protection area – Establish buffer between operational area/business area with groundwater/spring protection area – SOP on operational/business activities near groundwater/spring protection area – Install information board on the prohibition of operational/business activities near groundwater/spring protection area
HCV 5 Fresh water for sanitation	Wells and river water	<ul style="list-style-type: none"> – Construction activities and plantation operation is water catchment area – Potential contamination from fertilizer residue, herbicide, pesticide and rodenticide near water catchment area. – Alteration of riverflow and oil palm planting in riverbanks – Land conversion of riverbank as local protection area 	<ul style="list-style-type: none"> – Prohibit the expansion of plantation/business activities in water catchment area – Establish buffer zone – Establish local protection area inside concession area – Minimize the use of fertilizer, herbicide, pesticide and rodenticide, and use environmental friendly alternatives – Training for staffs, workers and third parties on environmental education.
NKT 5 Direct Income Source (sea)	Fish and other seafood products: <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara,</i>	<ul style="list-style-type: none"> – Potential contamination from fertilizer residue, herbicide, pesticide and rodenticide – Potential contamination of oil, lubricant oil, 	<ul style="list-style-type: none"> – Use environmental friendly fertilizer, herbicide, pesticide and rodenticide (avoid dichlorodipenyl tetrachloride)

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
	<i>gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, puri halus/nasi</i>	domestic waste and CPO liquid waster	<ul style="list-style-type: none"> - Supervise the use of fertilizer, herbicide, pesticide and rodenticide application procedures/techniques (nozzle direction, lateral spray limit, mixing concentration, and non-paquet active ingredients) - Supervise waste management practices
NKT 5 Direct Income Source (Games)	Pigs and Deer	<i>No threats</i>	-
NKT 5 Craft Material	Tree bark; <i>genemo, sukun hutan, keleri, iyuweh</i>	<ul style="list-style-type: none"> - Potential land conversion for expansion or infrastructure - Excessive planting over forest ecosystem boundary 	<ul style="list-style-type: none"> - Socialization of HCV management tools for craft material and tools (SOP, supervision, management, complaints, sanctions, award, etc) - Enforcement of compliance/implement regulation on planting that ensure the protection/maintenance/improvement of HCV (SOP, supervision, management, complaints, sanctions, award, etc) to avoid planting over forest boundary
NKT 5 Subsistence Farmland	Rainfed farm Vegetable and Fruit Garden; rica (cabe), jagung, kacang tanah, kacang panjang, kacang hijau, sawi, pisang, ubi jalar, singkong, gedi, bayam, labu, timun, pare	<i>No threats</i>	-
NKT 5 Fuel	Timber: Kayu merbau, matoa, genemo, besi, minyak, reside, Bamboo		-
NKT 5 Obat-obatan Tradisional	Daun gatal, mengkudu, sarang semut, tali kuning, akar kuning	<ul style="list-style-type: none"> - Potential land conversion for expansion or infrastructure - Excessive planting over forest ecosystem boundary - Conflicted HCV management between different HCVs 	<ul style="list-style-type: none"> - Socialization of HCV management tools for craft material and tools (SOP, supervision, management, complaints, sanctions, award, etc) - Enforcement of compliance/implement regulation on planting that ensure the protection/maintenance/improvement of HCV (SOP, supervision, management, complaints, sanctions, award, etc) to avoid planting over forest boundary
NKT 5 Non-Timber Construction Material	<ul style="list-style-type: none"> - Nibung stem and leaves, - Rattan 	<ul style="list-style-type: none"> - Potential land conversion for expansion or infrastructure 	<ul style="list-style-type: none"> - Socialization of HCV management tools for craft material and tools (SOP, supervision,

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
		<ul style="list-style-type: none"> Excessive planting over forest ecosystem boundary 	<ul style="list-style-type: none"> management, complaints, sanctions, award, etc) Enforcement of compliance/implement regulation on planting that ensure the protection/maintenance/improvement of HCV (SOP, supervision, management, complaints, sanctions, award, etc) to avoid planting over forest boundary
NKT 5 Timber Construction Material	Timber: merbau, matoa, agatis, damar, masoi, empaka, lawang	<ul style="list-style-type: none"> Potential land conversion for expansion or infrastructure Excessive planting over forest ecosystem boundary Conflicted HCV management between different HCVs 	<ul style="list-style-type: none"> Socialization of HCV management tools for craft material and tools (SOP, supervision, management, complaints, sanctions, award, etc) Enforcement of compliance/implement regulation on planting that ensure the protection/maintenance/improvement of HCV (SOP, supervision, management, complaints, sanctions, award, etc) to avoid planting over forest boundary
HCV 5 Fodder	<i>Rumput gajah, kalanjana</i>	<i>No threats</i>	–
HCV 5 Vitamin Sources	Forest fruit (<i>Cempedak, etc</i>)	<ul style="list-style-type: none"> Potential land conversion for expansion or infrastructure 	<ul style="list-style-type: none"> Socialization of HCV management tools for craft material and tools (SOP, supervision, management, complaints, sanctions, award, etc) Enforcement of compliance/implement regulation on planting that ensure the protection/maintenance/improvement of HCV (SOP, supervision, management, complaints, sanctions, award, etc) to avoid planting over forest boundary
HCV 6 Sacred Sites	<ul style="list-style-type: none"> Goa Nenggoina Goa Nenggomana Ruija Rujahi Parigi Hamuku Bekas Kampung Hamuku Sungai busuk (Rarantiruma) Air Mabuk Anapireoonggre (Yaur language)/ Babrauguapi (Yerisiam language) 	<ul style="list-style-type: none"> Reduced and loss of HCV 6 sites along with the artifacts and local/tribal history Expansion of oil palm plantation and opeational activities such as land preparation <ul style="list-style-type: none"> Lack of understanding HCV 6 sites among contractors and UM Staffs. 	<ul style="list-style-type: none"> Establish SOP on land preparation integrated with HCV 6 components Dissemination of aforementioned SOP to staffs and contractor, including introduction to identified sacred site/HCV 6 Land clearing is supervised by Land Preparation Assistant with the knowledge on the importance of HCV 6

HCV Category / Sub-Category	HCV Attributes	Internal Threat	Management for Internal Threat
	<ul style="list-style-type: none"> – Goa Wamora – Makam Tanjung – Ubaina – Hamatre (Aha Juha) – Bahoom Wau 		
HCV 6 Important Cultural Sites	Rawa Beku, Dusun Sagu, Dusun Sagu Bokai, Dusun Sagu Kampung Sima, Dusun Sagu Manarueja, Dusun Sagu Nahina Mahire, Dusun Sagu Yarawobi	<ul style="list-style-type: none"> – Staffs and contractors are not knowledgeable on the locatio of HCV 6 sites 	<ul style="list-style-type: none"> – Establish SOP on land preparation integrated with HCV 6 components – Dissemination of aforementioned SOP to staffs and contractor, including introduction to identified sacred site/HCV 6 – Land clearing is supervised by Land Preparation Assistant with the knowledge on the importance of HCV 6
HCV 6 Culturally Important Species	<ul style="list-style-type: none"> – Bird of paradise – Sagu (<i>Metroxylon sagu</i>) 		<ul style="list-style-type: none"> – Establish SOP on land preparation integrated with HCV 6 components – Dissemination of aforementioned SOP to staffs and contractor, including introduction to identified sacred site/HCV 6 – Land clearing is supervised by Land Preparation Assistant with the knowledge on the importance of HCV 6 – Affirmation, marking and protection activities for HCVA/HCVMA Sago (<i>Metroxylon sagu</i>) (HCV 5/6) – Implementing more ecological management and construction of ditches, especially in areas near HCVA/HCVMA

Table 45. External threat identification and management for HCV in PT NB

HCV Category / Sub-Category	HCV Attributes	External Threat	Management for External Threat
HCV 1.1 Biodiversity for protected or conservation area	Forest in Wanggar R – Bumi River Peat Hidrological Unit inside HGU Forest in River Protected Area inside HGU	Lack of understanding on protected forest area Request from local communities to establish smallholders.	Install information board, in cooperation with village government and local tribes on HCV 1.1 Awareness campaign on regulation and function of protected forest
HCV 1.2 Critically Endangered Species	Mammals Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>)	<ul style="list-style-type: none"> – Hunting of HCV 1.2 species for food – Illegal logging at HCV 1.2 habitat – Lack of knowledge and awareness on wildlife conservation, especially HCV 1.2 species. 	<ul style="list-style-type: none"> – Limitation of hunted species, mutually agreed by tribes and government – Hunting prohibition for HCV 1.2 species within HGU area – Install information board, in cooperation with village government and local tribes on HCV 1.2 species – Awareness campaign to local people on the existence, status and importance of HCV 1.2 species – Patrol with local people to reduce illegal logging and poaching. – Encourage law enforcement for illegal logging cases – Work with local tribes to regulate logging in forest classified as HCVMA1.2
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Vegetation: <i>Flindersia pimenteliana</i> (Rutaceae) (EN), <i>Intsia bijuga</i> , <i>Pterocarpus indicus</i> (Fabaceae), <i>Myristica subalulata</i> (Myristicaceae) (VU), <i>Anisoptera thrurifera polyandra</i> (Dipterocarpaceae)(VU), and <i>Aquilaria filaria</i> (Thymelaeaceae) (Appendix.II).	<ul style="list-style-type: none"> – Forest clearing in water absorption area or upstream are by local people – Harvesting HCV 1.3 species for carpentry material – Lack of knowledge and awareness on HCV 1.3 species (rare, threatened, endangered) 	<ul style="list-style-type: none"> – Install information board, in cooperation with village government and local tribes on HCV 1.3 – Participatory patrol in HCVMA to prevent illegal logging – Facilitate agreement between timber user communities to regulate/manage logging, such as restriction on diameter, restriction on number of trees to be cut down, and encourage the agreement into practice – Work with local tribes to regulate logging in forest classified as HCVMA1.3
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	Mammals: Familia Phalangeridae; <i>Spiloglossus rufoniger</i> , <i>Spiloglossus maculatus</i> , <i>Phalanger intercastelanus</i> , Familia Macropodidae; <i>Dorcopsis muelleri</i>	<ul style="list-style-type: none"> – Hunting of HCV 1.3 species by local people – Lack of understanding and awareness if local people on the importance of wildlife conservation, – Illegal logging 	<ul style="list-style-type: none"> – Limit game animals, with local tribes and village government – Hunting prohibition for HCV 1.3 species, in HCVMA 1.3 – Install information board, in cooperation with village government and local tribes on HCV 1.3

HCV Category / Sub-Category	HCV Attributes	External Threat	Management for External Threat
		<ul style="list-style-type: none"> - The existence of Provincial road provide easy access for mammals hunting. 	<ul style="list-style-type: none"> - Patrol with local communities to reduce illegal logging - Awareness campaign to local people on the existence, status and importance of HCV 1.3 species - Provide alternative protein source to alleviate/reduce hunting of HCV 1.3 species - Encourage law enforcement for illegal logging cases
HCV 1.3 Viable Populations of Endangered, Restricted Range or Protected Species	30 avian species	<ul style="list-style-type: none"> - Extensive hunting of HCV species - Lack of understanding and awareness on HCV 1.3 species among local people - Illegal logging 	<ul style="list-style-type: none"> - Limit game animals, with local tribes and village government - Hunting prohibition for HCV 1.3 species, in HCVMA 1.3 - Install information board, in cooperation with village government and local tribes on HCV 1.3 - Patrol with local communities to reduce illegal poaching - Awareness campaign to local people on the existence, status and importance of HCV 1.3 species - Provide alternative protein source to alleviate/reduce hunting of HCV 1.3 species - Encourage law enforcement for illegal logging cases
HCV 2.2 Areas that Contain Two or More Contiguous Ecosystems	Landscapes that contain intact ecotones between lowland swamp forest and lowland forest	<ul style="list-style-type: none"> - Conversion from forest into non-forest by local people - Lack of understanding and awareness on the importance of ecosystem and ecotones among local people 	<ul style="list-style-type: none"> - Install information board, in cooperation with village government and local tribes on HCV 2.2 - Awareness campaign to local people on the existence, status and importance of HCV 2.2 - Work with local tribes and village government to develop village and farmland development plans. - Encourage law enforcement for illegal logging cases
2.3 Areas that Contain Representative Populations of Most Naturally Occurring Species	All eagles, hornbill, Pigeons, Lories and Cockatoo, Cassowary, Bird of Paradise, <i>Lao-lao</i>	<ul style="list-style-type: none"> - Conversion from forest into non-forest by local people - Lack of understanding and awareness on natural ecosystem - Hunting of natural population indicator species - Illegal Logging 	<ul style="list-style-type: none"> - Facilitate intensive farming pattern to reduce expansion to HCVA 2.3 - Install information board, in cooperation with village government and local tribes on HCV 2.3 - Work with local tribes and village government to develop village and farmland development plans. - Patrol with local communities to reduce illegal logging - Awareness campaign to local people on the existence, status and importance of HCV 2.3 - Provide alternative protein source to alleviate/reduce hunting of HCV 2.3 species

HCV Category / Sub-Category	HCV Attributes	External Threat	Management for External Threat
			<ul style="list-style-type: none"> – Encourage law enforcement for illegal logging cases
HCV 3. Rare, threatened, or endangered ecosystems, habitats or refugia.	<p>Rare ecosystem: Lowland Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes</p> <p>(no management area)</p>	<ul style="list-style-type: none"> – Lack of understanding on rare ecosystem 	<ul style="list-style-type: none"> – Awareness campaign to local people on the existence, status and importance of HCV 3
HCV 4.1. Areas or Ecosystems Important for the Provision of Water and Prevention of Floods for Downstream Communities	Waterbodies and riverbank, swamp forest ecosystem, mangroves and estuarine ecosystem	<ul style="list-style-type: none"> – Land conversion in water absorption area and riverbank for farming purposes. – Illegal logging activities in upstream area, both by company and community – Gold and sand mining activities – Government/provincial road construction that alter river course – Lack of understanding on ecosystem service that provide water and prevent flood among local people. 	<ul style="list-style-type: none"> – Participatory patrols within HCV 4.1, 4.2, and 4.3 area to control illegal logging at upstream area – Legal actions against infraction of HCV 4.1 – Create agreement with communities, tribe elders and village officials to regulate timber harvesting and land clearing to avoid disrupting water debit in upstream river – Installation of information board that contains picture and general description of HCV 4.1, in the name of village government, local tribe and company – Provide information to local people on ecosystem service functions as freshwater source and flood control – Awareness campaign on the prohibition of illegal mining
HCV 4.2 Areas Important for the Prevention of Erosion and Sedimentation	Hilly area with TBE value > 180 ton/ha/year	<ul style="list-style-type: none"> – Illegal logging on area with high erosion hazard level (>180 ton/ha/year) and on upstream area – River sedimentation due to mining activities – Land onversion of riverbanks – Land conversion in area with high erosion hazard level (>180 ton/ha/year) by local people – Lack of understanding on forest fuction in preventing erosion and riverbank sedimentation among local people 	<ul style="list-style-type: none"> – Installation of information board that contains picture and general description of HCV 4.2 in the name of village government, local tribe and company – Create agreement with communities, tribe elders and village officials to regulate timber harvesting and land clearing to avoid disrupting ecosystem service in erosion and sedimentation control

HCV 4.3 Areas that Function as Natural Barriers to the Spread of Forest or Ground Fire	Lowland forest, swamp forest, Wami River, Yaro River, and Wanggar River and their riverbank	<ul style="list-style-type: none"> – Land conversion for farming purposes – Land clearing using fire on dry season – Illegal logging – Lack of understanding on forest function as natural fire barrier among local people 	<ul style="list-style-type: none"> – Installation of information board that contains picture and general description of HCV 4.2 in the name of village government, local tribe and company – Create agreement with communities, tribe elders and village officials to regulate timber harvesting and land clearing to avoid disrupting ecosystem service as natural fire barrier – Awareness campaign on the function of forest as natural fire barrier
HCV 5 Carbohydrate Source	Natural and cultivated sago, tubers (<i>betatas, ubi jalar, singkong, sukun hutan</i>)	<ul style="list-style-type: none"> – Land conversion in sago plantation dan farming area for settlement expansion and infrastructure construction purposes – Whirlwind, lightning, land and forest fire 	<ul style="list-style-type: none"> – Capacity building on the prevention and control of plant disease using environmental friendly techniques – Community based hydrometeorological risk management and climate change adaptation – Participatory risk management on fire hazard, especially on sago groves and agricultural land – Organizing sago harvesting group and farmer group
HCV 5 Protein Source	<ul style="list-style-type: none"> – Freshwater fish: <i>Ikan gabus, lele, bethik, tawes, gurami, nila, belut, udang, kepiting</i> – Brackis water fish; <i>bolana/belanak</i> (mullet fish), <i>somasi</i> (bass), <i>kakap putih</i> (baramundi), <i>kakap merah</i> (mangrove jack) <ul style="list-style-type: none"> – Saltwater fish; <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri.</i> 	<ul style="list-style-type: none"> – Extensive hunting of protein source with no consideration for species limitation and without regard of protection status – Local community do not have any regulation whatsoever in regard to limit or manage hunting mechanism – Local community do not have any traditionally agreed catchment space or area – Local people do not possess optimum understanding on protected species 	<ul style="list-style-type: none"> – Establish hunting limit of protein sources from protected wildlife species – Establish schedule for traditional hunting to fulfill protein needs – Wildlife conservation and environmental education for HCV management at school, religious activities, and local social activities.
HCV 5 Fresh water for drinking and cooking	Well (groundwater)	<ul style="list-style-type: none"> – Potential conversion of spring protection area into farming area, settlement, and/or public facilities. – Illegal logging in spring protection area – Prolonged dry season 	<ul style="list-style-type: none"> – Education on clean water and health, and the danger of pollution, including the risk of goldmining – Install information board in the name of local government and company – Enforce regulations on local protection area, through cultural or social means – Establish protection, integrated with village/traditional spatial pattern – Enforcement of social/custom rules and village regulation on goldmining and sandmining

			<ul style="list-style-type: none"> – Water supply alternative in case of low quality water should be discussed with local stakeholders
HCV 5 Fresh water for sanitation	Well and river	<ul style="list-style-type: none"> – Conversion of local protection area – Illegal logging in local protection area 	<ul style="list-style-type: none"> – Education on clean water and health – Enforce regulations on local protection area, through cultural or social means – Establish protection, integrated with village/traditional spatial pattern – Legal actions against infraction – Awareness campaign on the prohibition of illegal goldmining
NKT 5 Direct Income Source (sea)	Fish and other seafood products: <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, puri halus/nasi</i>	<ul style="list-style-type: none"> – Harvesting of fish and non-fish product through unsustainable method (bomb, poison, trawl use), by people from other area – Extensive fish harvesting using small-eyed net – Water pollutions, liquid and solid domestic waste from settlements along rivers that emptied into Teluk Cendrawasih 	<p>Education and advocacy on marine environment conservation</p> <p>Establish and enforce village/custom regulation on the management of marine resources as protein source and direct income</p>
HCV 5 Direct Income Source (Games)	Pigs and Deer	<ul style="list-style-type: none"> – Hunting without regard to species limitations and its protection status – Local community do not have any regulation whatsoever in regard to limit or manage hunting mechanism – Local community do not have any traditionally agreed catchment space or area – Local people do not possess optimum understanding on protected species 	<p>Hunting limit for protected species</p> <p>Wildlife conservation and environmental education for HCV management at school, religious activities, and local social activities.</p>
HCV 5 Non-Timber Construction Material	– Nibung stem and leaves, Rattan	<ul style="list-style-type: none"> – Potential of illegal logging activities by people who lives near material sources – Conversion of land into other purposes 	<p>Socialization on sustainable harvesting practices</p> <p>Strengthen the status of village forest to prevent land conversion</p> <p>Establish village/custom regulation to protect/maintain/imrpove forest and avoid conversion</p> <p>Establish and enforce regulation on illegal logging</p>
HCV 5 Timber Construction Material	Timber	<ul style="list-style-type: none"> – Potential of illegal logging activities by local people. – Conversion of land into other purposes 	<p>Socialization on sustainable harvesting practices</p> <p>Strengthen the status of village forest to prevent land conversion</p> <p>Establish village/custom regulation to protect/maintain/imrpove forest and avoid conversion</p>

			Establish and enforce regulation on illegal logging
HCV 5 Traditional Medicine	Daun gatal, mengkudu, sarang semut, tali kuning, akar kuning	-	-
HCV 5 Fuel	<i>Kayu merbau, matoa, genemo, besi, minyak, reside, bambu</i>	-	-
HCV 5 Subsistence Farmland	Vegetable and Fruit Garden Rainfed farm	<ul style="list-style-type: none"> - Conversion of farmland into other purposes - Pest, flood, drought 	Capacity building on environmentally friendly pest control Coordination with various relevant offices for food security awareness campaign
HCV 5 Craft Material	Tree bark; <i>genemo, sukun hutan, keleri, iyuweh</i>	<ul style="list-style-type: none"> - Potential of illegal logging activities by local people. - Conversion of land into other purposes 	Socialization on sustainable harvesting practices Strengthen the status of village forest to prevent land conversion Establish village/custom regulation to protect/maintain/improve forest and avoid conversion Establish and enforce regulation on illegal logging
HCV 5 Vitamin Sources	Forest Fruit (Cempedak, etc)	<ul style="list-style-type: none"> - Potential of illegal logging activities by local people. - Conversion of land into other purposes 	Socialization on HCV 5 management tools (SOP, supervision, monitoring, complaints, sanctions, award, etc) Establish village/custom regulation to protect/maintain/improve forest and avoid conversion
HCV 6 Sacred Sites	<ul style="list-style-type: none"> - Goa Nenggoina - Goa Nenggomana - Ruija - Rujahi - Parigi Hamuku - Bekas Kampung Hamuku - Sungai busuk (Rarantiruma) - Air Mabuk - Anapireoonggre (Bahasa Yaur)/ Babrauguapi (Bahasa Yerisiam) - Goa Wamora - Makam Tanjung - Ubaina - Hamatre (Aha Juha) - Bahoom Wau 	<ul style="list-style-type: none"> - Conversion of HCV 6 area into farms, settlement, smallholders. - Abrasion 	<ul style="list-style-type: none"> - Develop model information on site location, from relevant authority and/or village government - Periodic check to prevent land trade - Participatory mapping on HCV 6 and establish the area as local protection zone - Establish spatial pattern for village/tribes
HCV 6 Important Cultural Sites	Dusun Sagu, Rawa Beku	Conversion Dusun Sagu into farmland, settlement, or smallholders.	Develop village spatial planning
HCV 6 Culturally Important Species	Bird of paradise Sago (Metroxylon sago)	<ul style="list-style-type: none"> - Opportunistic hunting of bird-of-paradise species 	Establishment, marking, and protection activities of HCVA/HCVMA for Sago by local tribes

		<ul style="list-style-type: none"> - Illegal logging - Forest conversion - Excessive use by local people - Habitat disruption 	Revitalization of sago culture to local people
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Table 46. Recommendations for Management and Monitoring to Maintain and Enhance HCVs in PT NB

HCV Category or Sub-Category and Attribute		HCV AREA	MANAGEMENT	MONITORING
HCV 1.1	Forest inside HGU, adjacent to indicative protection function of Wanggar R-Bumi R Peat Hydrological Area	Forest (HCVMA) (Swamp forest within Wanggar R-Bumi R Peat Hydrological) Forest in River Protected Area inside HGU	Work with local stakeholder to verify Wanggar R-Bumi R Peat Hydrological Area, inside HGU area Re-delineation of HCV 1.1 FPIC on HCV management Habitat improvement using local vegetation species in HCV 1.1 area	Internal monitoring and evaluation techniques in accordance to M&E SOP Satellite imaging to find annual land cover changes on peat hydrological area Internal and external threat monitoring, periodic, using integrated monitoring system
HCV 1.2	Mammals Black Spotted Cuscus (<i>Spiloglossus rufoniger</i>)	Forest (lowland forest ecosystem) (HCVA, HCVMA)	<ul style="list-style-type: none"> - FPIC on HCV management (management plan and area) - Habitat improvement using local vegetation species in area presumed as habitat for HCV 1.2 - Build monitoring system for threat against HCV 	<ul style="list-style-type: none"> - Annual Quantitative Monitoring of HCV 1-3 to ensure their abundance - Internal monitoring and evaluation techniques in accordance to M&E SOP - Patrol to reduce illegal logging - Annual Quantitative Monitoring of HCV 1.2 to ensure their abundance - Monitoring result shall be analyzed by competent parties (expert/academician) and company - Information on poaching, illegal logging and land conversion should be collected every three month to determine quality and quantity of damage - Conduct FGD with local people and staffs to measure their understanding level on HCV 1.2 - Internal and external threat monitoring, using integrated monitoring system
HCV 1.3	Vegetation: <i>Flindersia pimenteliana</i> (Rutaceae) (EN), <i>Intsia bijuga</i> , <i>Pterocarpus indicus</i> (Fabaceae), <i>Myristica subululata</i> (Myristicaceae) (VU).	Forest (lowland forest and swamp forest ecosystem) (HCVA and HCVMA)	<ul style="list-style-type: none"> - Habitat improvement using local vegetation species in area presumed as habitat for HCV 1.3 - Build monitoring system for threat against HCV 1 	<ul style="list-style-type: none"> - Internal monitoring and evaluation techniques in accordance to M&E SOP - Establish permanent demplot to monitor vegetation composition and structure - Annually vegetation monitoring to ensure quantity, structure, composition, distribution, and abundance of indicator species using cruising method for 2 km on permanent or non-permanent forest transect

HCV Category or Sub-Category and Attribute		HCV AREA	MANAGEMENT	MONITORING
				<ul style="list-style-type: none"> – Monitoring result shall be analyzed by competent parties (expert/academician) and company – Internal and external threat monitoring, using integrated monitoring system
HCV 1.3	Mammals: Familia Phalangeridae ; Spilocuscus rufoniger, Spilocuscus maculatus, Spilocuscus maculatus goldiei , Phalanger intercasttelanus, Familia Macropodidae; Dorcopsis muelleri	Forest (lowland forest and swamp forest ecosystem) (HCVA and HCVMA)	<ul style="list-style-type: none"> – FPIC on HCV management (management plan and area) – Habitat improvement using local vegetation species in area presumed as habitat for HCV 1.2 and HCV 1.3 using local species – Build monitoring system for threat against HCV – Rehabilitation of all riverbank area connected to forest 	<ul style="list-style-type: none"> – Internal monitoring and evaluation techniques in accordance to M&E SOP – Annual mammals monitoring to ensure abundance of indicator species using cruising method for 4 km on permanent or non-permanent forest transect – Monitoring result shall be analyzed by competent parties (expert/academician) and company – Information on poaching, illegal logging and land conversion should be collected every three month to determine quality and quantity of damage – Conduct internal monitoring and evaluation for land clearing – Conduct FGD with local people and staffs to measure their understanding level on HCV 1-3
HCV 1.3	30 avian species	Forest (lowland forest and swamp forest ecosystem) (HCVA and HCVMA)	<ul style="list-style-type: none"> – FPIC on HCV management (management plan and area) – Build monitoring system for threat against HCV – Rehabilitation of all riverbank area connected to forest – Protect nesting trees of HCV species 	<ul style="list-style-type: none"> – Internal monitoring and evaluation techniques in accordance to M&E SOP – Annual birds monitoring to ensure abundance of indicator species using cruising method for 4 km on permanent or non-permanent forest transect – Monitoring result shall be analyzed by competent parties (expert/academician) and company – Questionnaire survey following awareness campaign for staffs and local people
HCV 2.2	Ecotone between lowland swamp forest and lowland forest	<ul style="list-style-type: none"> – Forest (swamp forest and lowland forest ecosystem) (HCVMA) – Ecotone (HCVA) 	<ul style="list-style-type: none"> – Enrichment of HCV 2.2 using local species – FPIC on HCV management (management plan and area) – Build monitoring system for threat against HCV 	<ul style="list-style-type: none"> Internal monitoring and evaluation techniques in accordance to M&E SOP Satellite imaging to find annual land cover changes Internal and external threat monitoring, periodic, using integrated monitoring system Updating ecosystem and ecotone monitoring data
HCV 2.3	All eagles, hornbill, pigeons, cassowary, lorries and cockatoo,	Forest (lowland forest and swamp forest ecosystem) (HCVA and	<ul style="list-style-type: none"> – Development of media information and education – Build monitoring system for threat against 	<ul style="list-style-type: none"> – Internal monitoring and evaluation techniques in accordance to M&E SOP – Participatory threat monitoring with local communities

HCV Category or Sub-Category and Attribute		HCV AREA	MANAGEMENT	MONITORING
	Lao-lao, Bird of Paradise	HCVMA)	HCV	<ul style="list-style-type: none"> – Updating landcover monitoring data, annually – Internal and external threat monitoring, using integrated monitoring system
HCV 3	Rare ecosystem: lowland savannah (without management area)	Lowland Grassland on Plains ecosystem, Mountainous Lowland Forest ecosystem, Mangroves and Estuarine ecosystem, waterbodies/lakes (HCVA)	<ul style="list-style-type: none"> – Development of media information and education – Build monitoring system for threat against HCV 	<ul style="list-style-type: none"> – Internal monitoring and evaluation techniques in accordance to M&E SOP – Participatory threat monitoring with local communities – Updating rare ecosystem monitoring data – Internal and external threat monitoring, using integrated monitoring system
HCV 4.1.	Waterbodies and riverbank, swamp forest ecosystem, mangroves and estuarine ecosystem	<ul style="list-style-type: none"> – Forest – Riverbank 	<p>Rehabilitate riverbanks and upstream forest using local vegetation</p> <p>Add spraying zone of 10 m in riparian zone, to protect river quality against pesticides and fertilizer</p> <p>Development of media information and education</p> <p>Build monitoring system for threat against HCV</p>	<ul style="list-style-type: none"> – Internal monitoring and evaluation techniques in accordance to M&E SOP – Monitoring hotspot potential – Measure river width – Weekly measurement of river debit, turbidity and width after rain – Periodic quality measurement (during plantation and later when the mill is active) to rivers affected by operational activities – Monitoring drainage outlet (ditch and river) emptied to Cendrawasih Bay in cooperation with BKSDA and Cendrawasih Bay National Park) – Monitor threat against HCV 4.1 using Integrated monitoring system
HCV 4.2	Hilly area with TBE value > 180 ton/ha/year	<ul style="list-style-type: none"> – Potential TBE > 180 ton/ha/tyr (HCVA) – Hills with TBE > 180 ton/ha/year (HCVMA) 	<p>Rehabilitatiion for degraded slope area with high erosion hazard level (>180 ton/ha/year)</p> <p>Using gully plugs to manage and secure small cracks on waterway cliffs</p> <p>Development of media information and education</p> <p>Build monitoring system for threat against HCV</p>	<ul style="list-style-type: none"> – Internal monitoring and evaluation techniques in accordance to M&E SOP – <i>Ground check</i> conducted to ensure no oil palm planting in area with high erosion hazard level (> 180/ton/ha/year) and in riverbanks – Monitoring erosion and sedimentation in slope area where oil palm is planted by constructing erosion monitoring traps every three months – Turbidity measurement each month during rain season and each three month during dry season – Periodic sedimentation measurement – Monitor threat using Integrated monitoring system

HCV 4.3	Lowland forest, swamp forest, Wami River, Yaro River, and Wanggar River and their riverbank	<ul style="list-style-type: none"> – Swamp forest and River (HCVA and HCVMA) – Riverbank (HCVMA) 	Development of media information and education	<ul style="list-style-type: none"> Monitor forest clearing for oil palm plantation Monitor land clearing for infrastructure Monitor awareness of staffs and contractor on ecosystem services, especially on natural fire barrier Monitor threat using Integrated monitoring system
HCV 5	<ul style="list-style-type: none"> – Natural and cultivated sago, tubers (<i>betatas, ubi jalar, singkong, sukun hutan</i>) 	<ul style="list-style-type: none"> – Swamp forest (HCVA/HCVMA) – Dusun Sagu (HCVA/HCVMA) – Housing (HCVA) 	<ul style="list-style-type: none"> – Ensure the existence of sago groves and agricultural land to maintain availability of land for food production – Support to farmer and sago farmer by providing them access to productivity improvement, such as training and technical support. – Collaboration between PT NB and local farmer group in increase economic value of natural sago and other crops, beyond food security 	<ul style="list-style-type: none"> – Process and results of the establishment natural and cultivated sago HCVMA (all HCVA for sago, the size of HCVMA is HCVA plus buffer 10-15 meter wide) – Prohibition on entering HCVMA of sago groves and agricultural land without prior permit from owner or customary right holder (complaint/case, if any) – Periodic patrols with local people in natural sago location and farmland (implemented according to plan or not) – Sustainable management of sago and agricultural land by local people/right holder (yes/no) – Involvement of right holder/owners or customary holder of HCVMA in land preparation near HCVMA sago and agricultural land (implemented or not, case/complaints if any)
HCV 5	<ul style="list-style-type: none"> – Freshwater fish: <i>Ikan gabus, lele, bethik, tawes, gurami, nila, belut, udang, kepiting</i> – Brackis water fish; <i>bolana/belanak</i> (mullet fish), <i>somasi</i> (bass), <i>kakap putih</i> (baramundi), <i>kakap merah</i> (mangrove jack) – Saltwater fish; <i>ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan</i> 	River and estuarine (HCVA, HCVMA)	<ul style="list-style-type: none"> – No specific HCV management area for this attribute groups – Maintain habitat connectivities of game animals with other habitat beyond the area – Mapping the presence protected species to ease the monitoring and management activities – Identify and develop livestock potential to fulfill protein needs 	<ul style="list-style-type: none"> – Participatory monitoring for traditional fishing – Identify catchment area and its changes – Development of traditional catchment method by local community – Monitor indicative catchment area inside permit area and its corridors – Monitor game species and total catchment, periodically – Protect, maintain, and improve the presence and access of freshwater fish in rivers inside concession area

	<i>terbang, sako, udang, kepiting, bia, gurita, suntung, puri.</i>			
HCV 5	Well (groundwater)	Housing/settlement (HCVA)	<ul style="list-style-type: none"> - Establishment of groundwater and spring protection area (such as buffer and banks) - Prohibit company operation inside groundwater/spring protection area - Review new expansion/plantation plans 	<ul style="list-style-type: none"> - Interview with staffs and third party to determine their understanding on SOP on business operation near groundwater/spring protection area - Periodic debit measurement and water quality test (physically, biologically, chemically) – including pollution risks from gold mining - Monitoring and patrol in groundwater/spring protection area
HCV 5	Well and river	Settlement and river (HCVA)	<ul style="list-style-type: none"> - Establishment of groundwater and spring protection area, and prohibit business activities in the area - Development of public/village/community information media on river protection, supported by local government and company - Establishment of local protection zone - Establishment of buffer zone, in participatory manner 	<ul style="list-style-type: none"> - Monitor the implementation of SOP on prohibition of business activities in local protection zone - Monitor the implementation of SOP on the use of fertilizer, herbicide, pesticide, and rodent control - Periodic water quality and debit measurement - Observation/patrol in local protection zone - Measurement on river quality - Monitoring threat using integrated monitoring system
HCV 5	Fish and other seafood products: ikan kombong, mumar, oci, cakalang, tengiri, barakuda, layur, goropa, bobara, gumuru, ikan terbang, sako, udang, kepiting, bia, gurita, suntung, puri, puri halus/nasi	Sea (HCVA)	<ul style="list-style-type: none"> - Engagement stakeholders of Teluk Cendrawasih marine environment into law enforcement and collaborative management - Facilitate production increase and develop model for fish product distribution 	<ul style="list-style-type: none"> - Monitor the implementation of SOP on the use of fertilizer, herbicide, pesticide, and rodent control - Monitor and document fishing activities - Participatory monitoring and patrol
HCV 5	Pigs and Deer	Forest around village/settlement (HCVA)	<ul style="list-style-type: none"> - No specific HCV management area for this attribute groups - Maintain habitat connectivities of game animals with other habitat beyond the area - Mapping the presence protected species to ease the monitoring and management activities - Identify and develop direct income potential for local people 	<ul style="list-style-type: none"> - Protect, maintain, and improve the presence and access of protected species inside concession area
HCV 5	Tree bark; genemo, sukun hutan, keleri,	Forest around village/settlement	<ul style="list-style-type: none"> - Diversification of plants for craft material - Install information board in the name of local 	<ul style="list-style-type: none"> - Monitor and document harvesting activities of material and its utilization for tools, furniture and craft

	iyuweh	(HCVA)	government, local tribes and company	<ul style="list-style-type: none"> - Document local methods of craft material harvesting - Periodic patrol to control the harvesting of forest and non-forest products - Interview and FGD with local communities
HCV 5	Vegetable and fruit garden, rainfed farmland	Settlement LU1, LU2 (HCVA)	<ul style="list-style-type: none"> - Integration of food security issues into Village Planning, including cost sharing (with company as third party) - Facilitate village spatial planning for food source management - Facilitate community land use planning for food production 	<ul style="list-style-type: none"> - Monitor sustainable and fair access for local communities of food source and agriculture land needs - Monitor protection/maintenance/improvement efforts of land availability to support food security
HCV 5	Kayu merbau, matoa, genemo, besi, minyak, reside, bambu	Around settlement LU1, LU2 (HCVA)	<ul style="list-style-type: none"> - Promoting healthy and efficient use of firewood (reduce indoor pollution) 	<ul style="list-style-type: none"> - Monitor and document firewood harvesting activities - Interview and FGD with local communities
HCV 5	Daun gatal, mengkudu, sarang semut, tali kuning, akar kuning	Forest (HCVA)	<ul style="list-style-type: none"> - Diversification and intensification of traditional medicine species - Install information board in the name of local government, local tribes and company 	<ul style="list-style-type: none"> - Monitor and document traditional medicine harvesting activities - Periodic patrol to control the harvesting of forest and non-forest products - Document local methods of traditional medicine harvesting - Interview and FGD with local communities
HCV 5	Nibung stem and leaves, Rattan	Forest around village (HCVA)	<ul style="list-style-type: none"> - Diversification of plants for craft material - Install information board in the name of local government, local tribes and company 	<ul style="list-style-type: none"> - Monitor and document harvesting activities of material and its utilization for tools, furniture and craft - Document local methods of craft material harvesting - Periodic patrol to control the harvesting of forest and non-forest products - Interview and FGD with local communities
HCV 5	Rumput gajah, kalanjana	Around village (HCVA)	<ul style="list-style-type: none"> - Diversification of fodder 	<ul style="list-style-type: none"> - Monitor and document livestock rearing and fodder harvesting activities - Interview and FGD with local communities
HCV 6	<ul style="list-style-type: none"> - Goa Nenggoina - Goa Nenggomana - Rujia - Rujahi - Parigi Hamuku - Bekas Kampung Hamuku - Sungai busuk (Rarantiruma) - Air Mabuk - Anapireoonggre 	Forest, river, grassland (HCVA/HCVMA)	<ul style="list-style-type: none"> - Establish buffer zone for each site after HCV 6 is agreed upon consultation with relevant stakeholders. - Determine on site area, together with relevant parties. - Strengthen traditional governance and revitalize local traditional, cultural and social values - Conduct ethnographic study on Yerisiam Tribe - Develop information and education media on HCV 6 	<ul style="list-style-type: none"> - Routine monitoring to guard against vandalism on HCV 6 - Monitoring the implementation of SOP for land clearing where HCV 6 is present - Socialization on HCV 6 -

	(Yaur)/ Babrauguapi (Yerisiam) – Goa Wamora – Makam Tanjung – Ubaina – Hamatre (Aha Juha) – Bahoom Wau			
HCV 6	Dusun Sagu, Rawa Beku	Swamp forest Dusun Sagu, Swamp (HCVA/HCVMA)	– Participatory mapping on Dusun Sagu – Develop information and education media on the cultural value of Dusun Sagu	– Routine patrol and monitoring to protect Dusun Sagu
HCV 6	Burung Cendrawasih	Habitat of bird-of-paradise (all remaining forest) (HCVA/HCVMA) Sago (<i>Metroxylon sagu</i>) habitat (Swamp forest) (HCVA) Sago Groves (HCVMA)	Bird-of-paradise habitat mapping and dissemination Good practice of cultivation and use of sago in Sago Groves Promote Sago Culture to younger generation	Routine patrol and monitoring to protect Bird-of-paradise Complaints of local people on accessibility to Sago (complaints, if any, and type of disruption) Complaints on boundary trespass caused by operational activities. (if any, disruption area) Distribution of sago habitat (loss/not, indicative area) Data on the quality of cultivated sago

4.5. Summary of Remediation and Compensation Plan

The result of LUCA and outcome of HCV Assessment has been used to calculate remediation and compensation liabilities (due to land clearance that followed the first HCV assessments).

Environmental Remediation:

In PT NB and SAP concessions a total of 571 ha of riparian areas is in need of environmental remediation while best management practices will be implemented for identified areas of peatland.

Social Remediation:

Identification of the loss of social HCV's (HCV 4, 5, and 6) was carried out via discussions, interviews and field inspections with relevant stakeholders, in particular Wanggar and Sima community members. There is no outstanding social liability as the loss of HCV 4 and 5 areas due to corporate activities has already been identified and remediated by the companies in a manner satisfactory to the affected parties.

Compensation:

Conservation liability has been decided by RSPO Compensation Panel and Complaints Panel according to the outcome of LUCA and HCV assessment. The Final Conservation Liability (FCL) for PT NB and SAP is 3,370 ha.

Concept note for the remediation and compensation plan has been approved by RSPO and full remediation and compensation plan is undergoing evaluation process. Remediation and compensation liabilities will be addressed through implementation of the following management plans:

1. PT NB and PT SAP On-site riparian zone remediation plan
2. PT NB and PT SAP On-site best management practices for peatland
3. Collective Compensation Plan for the Conservation of Customary Forest in Nabire, Papua.

The collective Compensation Plan will support the conservation of 3,370 ha of customary forest in Nabire, Papua Province. The proposed project area comprises forest currently designated as Other Land Use (*Areal Penggunaan Lain*), Protected Forest (*Hutan Lindung*) dan Production Forest (*Hutan Produksi*) under customary lands of Yaur and Yaro communities. Currently the quality of forest cover is good but there's no conservation program taken place in this area.

The Compensation plan aims to secure and restore forest quality through the social forestry mechanism to give the local people legal access in managing and utilizing the state forest. Under the social forestry scheme, the proposed compensation area will be granted a management right for a period of thirty-five years (can be extended). This will encourage customary communities to be involved in the planning, decision-making, implementation and management of the program. In the long-term, the community will be prepared to independently manage the Conservation Area for ecotourism and sustainable alternative incomes such as Non-timber Forest Product (NTFP) and environmental services.

The compensation project will be supported by a multi-stakeholder working group, comprising representatives of customary communities, local government agencies, nature conservation office (BBKSDA), academics and NGOs, engaging key stakeholders in a collaborative conservation program. It will be jointly designed with local key stakeholders such as the customary communities, Agency for

Regional Development (BAPPEDA), Natural Resources Conservation Office (BBKSDA), academics and NGOs.

The proposed conservation compensation activities are designed to:

1. Enhance customary communities and stakeholders commitment in customary forest conservation management.
2. Reduce the direct pressures on forest and biodiversity.
3. Maintain and enhance forest quality.
4. Promote the sustainable use of natural resources.
5. Ensure the maintenance of ecosystem services.

Implementation of the participatory management plan will include forest monitoring and patrolling, regular meetings with the local community, capacity building activities and promoting sustainable livelihoods. A complete biodiversity baseline assessment will be required at the start of the project, building on the findings of the HCV. Monitoring and evaluation of the compensation plan will be conducted by measurable indicators of efficiency, effectiveness, and impact. Progress will be reported as documents and will be evaluated based on milestone according to the implementation timeline.

Methods of riparian remediation activities will combine conservation activities to promote the natural succession of forest trees species along with implementation of Best Management Practices in developed areas to minimize further negative impacts and to recover the riparian zone function as before land conversion into oil palm. There will be no chemical application in the riparian areas and only manual keeping activities will be applied. Components of the remediation plan shall include management and monitoring of threats and the vegetation and river water conditions as shall be defined in updated SOPs.

The peatland area remediation plan will involve delineation of peatland areas in concessions; water management and monitoring of the water table; prohibitions, restrictions and conservation activities in peatland areas. Through implementation of the management plan, we aim to maintain water levels and carbon stock and mitigate the negative impacts that can result from the cultivation of oil palm on peat. Implementation will be guided by soil assessment reports and RSPO according to the latest RSPO Manual on Best Management Practices for Existing Oil Palm Cultivation on Peat (2019).

Monitoring and evaluation of all remediation activities will be conducted using measurable indicators to determine impact and effectiveness of the program and to guide adaptive management decisions.

4.6. Summary of Management Plan for the Mitigation of GHG Emissions

A management plan will be implemented to minimize further greenhouse emissions. As recommended in the assessment report, the management steps will include:

1. Periodic monitoring of carbon stocks / greenhouse gas emissions to monitor changes against baseline data.
2. Regulated use of fertilizers and pesticides, monitoring and optimizing the type and dose of fertilizer used.
3. Management and monitoring of conservation areas to maintain and enhance carbon stocks:
 - a. Management of peat conservation areas and fire prevention in peat areas.
 - b. Rehabilitation of degraded riparian zones / HCV areas.

- c. Monitoring and maintaining forested areas from disturbances (especially illegal logging).
4. Implementation of a peatland / water management and monitoring system for areas planted on peat.

Table 47. The Summary of PT. NB GHG Emission Management and Mitigation Plan

Source of Emissions	Mitigation Approaches	Monitoring Plan	PiC Responsibility	Time Plan
Land Clearing and Planting (Land Use Change)	<ul style="list-style-type: none"> Adopted Zero Burning Land Clearing methods Adopted and Comply with Procedure and Documentation Required for New Planting in Indonesian Regulation (EIA/AMDAL) and Other Standards (RSPO, ISPO, etc.) No Land Clearing in areas that identified as HCV/HCS area Keep the HCV/HCS area as Carbon Stock /sequestration. Socialization to employees and communities related with conservation and Green House Gas Mitigation programme 	Data collecting and reporting based on activities	EHS Dept and Plantation Dept	Yearly
Heavy equipment for Land Clearing	<ul style="list-style-type: none"> Routine Maintenance heavy equipment Regularly emission test on heavy equipment Socialization the impact of Green House Gas Emission to the worker 	Data collecting and report of emission source in operational activity	Plantation Dept and EHS Dept	Annually
Degradation of forest	<ul style="list-style-type: none"> Rehabilitation of degraded HCV areas including riparian areas. Routine inspection and patrol to avoid disturbance (especially illegal logging and fires) in forested areas, especially peatland. 3. Socialization on forest and peatland conservation. 	Data collecting and reporting based on activities	EHS Departement and Plantation Dept	Annually

Source of Emissions	Mitigation Approaches	Monitoring Plan	PiC Responsibility	Time Plan
Peatland subsidence (oil palm planted on peat soil)	<p>Management and monitoring according to the latest RSPO Manual on Best Management Practices for Existing Oil Palm Cultivation on Peat (2019) to minimize peat subsidence and associated greenhouse gas emissions.</p> <ul style="list-style-type: none"> Regulation of water flow: Main outlets are installed with water control structure (stop-offs or water gates) to regulate excess water flow to river preventing water from leaving the plantation during the dry months, mitigating the risk of over-drainage of the peat. Maintenance of vegetative ground cover is maintained as an approach to help reduce the drying of the peat surface and peatland oxidation. Monitoring of water management through the installation and use of water level gauge to measure water level in drainage systems and outlets and piezometers to measure the pressure of groundwater. Monitoring of peat subsidence through the installation and use of Subsidence poles. 	Data collecting and report of emission source	Agronomy and Plantation Dept	Annually
Fertilizer	<ul style="list-style-type: none"> Effective fertilizing based on dosages and recommendation from Agronomy Department Using EFB for mulching programme to reduce inorganic fertilizer usage No Fertilizing on Rainy Day No fertilizing on Riparian Zone Socialization to employee about Company's policy on Fertilizing 	Data collecting and report of emission source	Plantation Dept	Yearly
Pesticides	<ul style="list-style-type: none"> Actively monitor Pest-Diseases build-up and if so required Implement an effective control measures in order to minimize the potential loss of yield due to outbreak; Inspected all blocks first by plantation staff prior to spraying in order to enable appropriate selection of Herbicides and equipments to suit the field conditions; Seek advice from Agronomy Advisor for the used of any new Herbicides that are constantly coming onto the market Adopted in formulating desirable Pest-Disease control strategy and biological 	Data collecting and report of emission source in operational activity	Plantation Dept	Yearly

Source of Emissions	Mitigation Approaches	Monitoring Plan	PiC Responsibility	Time Plan
	<p>control agents: Introduction of Barn Owl, and adoption of appropriate weed management methods with beneficial plants.</p> <ul style="list-style-type: none"> No chemical use in Riparian Educate and awareness the worker regularly to implement good practices in chemical use activities 			
Transport (Harvesting and Maintenance)	<ul style="list-style-type: none"> Routine Maintenance for Transportation Regularly emission test on Transport Socialization the impact of Green House Gas Emission to the worker 	Data collecting and reporting based on activities	Plantation Dept	Annually
Housing Complex electricity	<ul style="list-style-type: none"> Energy conservation campaign. 	Monthly report	EHS Dept	Annually
Household waste to Landfill	<ul style="list-style-type: none"> Reduce, Reuse, Recycling Programs. 	Monthly report	Plantation Dept	Annually
Mill Power: Boiler and Generatorset (Genset) for electricity	<ul style="list-style-type: none"> Regularly conducted emission test in Boiler and Genset. Routine maintenance of boiler and genset. Using Shell and Fiber from FFB Process as a Fuel to reduce Fossil Fuel Use for Boiler. 	Data collecting and report of emission source in operational activity	Mill Operation Dept	Annually
POME (Palm Oil Mill Effluent)	<ul style="list-style-type: none"> Digested POME for Land Application to replace inorganic fertilizer (the location of application is around the Mill Location). 	Data collecting and report of emission source in operational activity	Mill Opretation Dept	Annually

5. REFERENCES

- Brown, E. and M.J.M. Senior. 2014. Common Guidance for the Management and Monitoring of High Conservation Values: A Good Practice Guide for the Adaptive Management of HCVs. HCV Resource Network. Oxford, UK.
- Brown, E., N. Dudley, A. Lindhe, D. R. Muhtaman, C. Stewart and T. Synnott. 2013. Common Guidance for the Identification of High Conservation Values: A Good Practice Guide For Identifying HCVs Across Different Ecosystems and Production Systems. HCV Resource Network. Oxford, UK.
- FPIC Gap Analysis of PT Nabire Baru and PT Sariwana Adi Perkasa carried out by Lingkar Komunitas Sawit (LINKS) in 2016 (Laporan Gap Analisis Pemenuhan FPIC Pada Pembangunan Perkebunan Kelapa Sawit Goodhope Group Di Kabupaten Nabire Provinsi Papua).
- GHG Assessment Report and Carbon Stock Calculation of PT Sariwana Adi Perkasa and PT Nabire Baru;, dated June 2018. Conduct and prepared by PT Ata Marie, Jakarta, Indonesia.
- Grievance Mapping Report of PT Nabire Baru and PT Sariwana Adi Perkasa, dated September 2017. Conduct and prepared by PT Ekologika Consultants, Jakarta, Indonesia.
- HCS Report: High Carbon Stock Assessment of PT. Nabire Baru and PT Sariwana Adi Perkasa, Papua, Indonesia. Dated November 2017. Conduct and prepared by PT Ata Marie, Jakarta, Indonesia.
- HCV Assessment Report: HCV Assessment of PT Sariwana Adi Perkasa, dated March-October 2017. Conduct and prepared by PT Ekologika Consultants, Jakarta, Indonesia.
- HCV-Resource Network. 2014. HCV Assessment Manual. HCV Resource Network and ProForest, Oxford, UK.
- Land Use Change Analysis Report PT Nabire Baru and PT Sariwana Adi Perkasa, dated May 2018. Conduct and prepared by PT Ata Marie, Jakarta, Indonesia.
- Peatland Assessment: Peatland Assessment of PT Sariwana Adi Perkasa and PT Nabire Baru, dated July 2017. Conduct and prepared by PT Ekologika Consultants, Jakarta, Indonesia.
- RSPO GHG Assessment Procedure for New Development version 3, October 2016.
- SIA Assessment Report: SIA Assessment of PT Nabire Baru, dated February 2018. Conduct and prepared by PT Ekologika Consultants, Jakarta, Indonesia
- Social and Environmental Assessments (AMDAL) of PT Nabire Baru was finalized on 18th December 2013. Conduct and prepared by PT Widya Cipta Buana Consultant, Papua, Indonesia.
- Soils Suitability Report: "Soils of the PT Nabire Baru Estate" and "Soils of the PT Sariwana Adi Perkasa Estate". This semi-detailed soil survey and soil management groups and sub-groups assessment for oil palm plantation. Both prepared March 2017 by Carmiel Agrotech SDN BHD and Param Agricultural Soil Surveys (M) SDN. BHD.

6. INTERNAL RESPONSIBILITY

6.1. Acceptance of Interpretations

The content of this report summarizes the information in (i) Social Environment Impact Assessment (SEIA), (ii) High Conservation Value (HCV) Assessment, (iii) Land Use Change Analysis (LUCA) Assessment and (iv) High Carbon Stock (HCS) Assessment. The assessors confirm that the information in the reports has been accurately interpreted here in the NPP report.

Signed for and on behalf of PT Nabire Baru (Date: 30 October 2019)



Edi Suhardi
Sustainability Director

Signed for and on behalf of PT Ekologika Consultants (Date: 30 October 2019)



Ninil Jannah
PT Ekologika Consultants

Signed for and on behalf of PT Ata Marie (Date: 30 October 2019)



Alex Thorp
Director

6.2. Acceptance of Responsibility

The outcomes of all assessment reports have been accepted by the Management of PT Nabire Baru and will be applied in developing and managing PT Nabire Baru as outlined in the management and monitoring plans presented in this report.

Management of PT Nabire Baru



Edi Suhardi
Sustainability Director