



Syarikat Samling Timber Sdn Bhd
A member of Samling Group of Companies

PUBLIC SUMMARY

of the

Forest Management Plan

for

Ulu Trusan Forest Management Unit

for the period 2017 to 2026

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Approved by:

James Ho Yam Kuan
Chief Operating Officer

Introduction

This is the public summary of the Revised Forest Management Plan (FMP) for the period of Year 2017 to Year 2026 written for the Ulu Trusan FMU. The changes have been made to allow any policy changes and developments to be incorporated and for revision to include the findings of the various monitoring activities.

Ulu Trusan FMU comprises of two (2) long term Forest Timber Licence (FTLs) T/0280 and T/9115 issued to KTN Timor Sdn. Bhd. and Majulaba Sdn. Bhd.

Management Objectives

- Forest planning and operations based on multi-functional concept which consider the different usage of forest resources and needs of stakeholders involved.
- Forest management practices to maintain or even enhance the forest ecosystem functions as to enable its self-renewal capacity through Reduced Impact Logging (RIL), rehabilitation and silviculture treatment.
- Detailed Harvesting Plans aimed at production of high-quality timber at optimum efficiency, reduced environmental impacts and minimise wastage of resources.
- Integration of climate adaption and mitigation plans which has a positive impact on long-term carbon sequestration capacity of forest vegetation.
- Multi-stakeholders' consultation to address issues of common interests and to monitor the operational activities.
- Continuous improvements to forest management through certification, research, collaborative partnership, updating methodologies and standards. and
- to take due and appropriate recognition of the FMU being in the **Heart of Borneo** corridor.

The Resource

The FMU is in Lawas District of Limbang Division, Sarawak. The FMU's Merarap camp lies some 70km by road south of Lawas Town. [\(Right click here to access Map A FMU location.\)](#)

It has total area of 92,279 ha, 67.5% of which is within the Ulu Trusan Protected Forest. A further 16.4% (15,118ha) lies within the Limbang Protected Forest and a small section 5.1% (4,671 ha) is inside the Trusan-Kelalan Protected Forest. The balance of the FMU is occupied by communities 10.3% (9,530 ha) and State land 0.7% (666 ha) which have been excluded from the protected forest areas. [\(Right click here to access Map B showing the land status.\)](#)

The topography of the FMU ranges from hilly to mountainous with the altitude ranging from 300 m to 1,828 m amsl. Gunung Pagon Priok (1,820 m) is located just outside the FMU in the Sarawak-Brunei international border zone.

The Paya Maga Conservation Area¹ (14,861ha) is currently within the FMU and lies on the Sarawak-Sabah inter-state border where Gg. Matalan rises to 1,828 m.

¹ The Paya Maga highland is part of the Murud complex and includes two major peaks, Tuyu Peak and Matalan Peak. A scientific expedition was jointly organised by FDS and SFC in 2010. Numerous scientists from various institutions and NGOs from Malaysia, Brunei Darussalam and Indonesia participated in data collection in this exceptionally bio-diverse area. Four major forest types are found here and UPM, Bintulu, is continuing research on the forest ecology of three of these: montane oak forest (1,200-1,500 m amsl); upper Dipterocarp Forest (750-1,200 m amsl); and Hill Dipterocarp Forest (<750 m amsl). Ulu Trusan FMU

About 69.4% of the FMU is classed as Terrain Class III with slopes between 20° and 35° and 14.5% is classed as Terrain Class IV with slopes greater than 35°.

The Merit soil series covers more than half the area the whole of which is mainly underlain by the Meligan Formation.

Hill mixed dipterocarp forest (MDF) is the forest type below 800 m representing 31.2% of the area. Shifting Agriculture covered 28.1% and followed by Payeh Maga of 16.1% of the FMU area. The FMU has been zoned into: **Protection:** 24,354 ha (26.4%), **Production:** 50,079 ha (54.3%), **Payeh Maga conservation area:** 14,486 ha (16.1%) and **Community & water catchment:** 2,985 ha (3.2%). ([Right click here to access Map I showing zoning and other information](#))

Forest management

The production forest will be managed on a polycyclic system based on prescribed DBH cutting limits (Selective Felling System) with the next harvest, and all subsequent harvests, provided by the residual stems (potential crop trees) and continued recruitment from natural regeneration. Use of a Reduced Impact Logging system, with extraction by modified excavator wincher, minimises damage to the residual stand. The FMU is divided into 24 coupes of about 2,003 ha with, nominally, one coupe harvested each year. The FORMIND growth simulation model used by Samling derives a sustainable annual cut (AAC) at an optimal cutting cycle based on the DBH cutting limits currently imposed by FDS of 45cm and 50 cm for non-dipterocarps and dipterocarps, respectively.

Harvest system

The use of reduced impact logging (RIL)², with break out and extraction by excavator based logfisher, is intended to minimise damage to the residual stand and regeneration which, as explained above, will form the next and subsequent harvests. All trees to be harvested must be identified, measured and tagged, and their locations mapped. Tagged trees which are within approximately 60 metres of the skid trail centre line are felled. The appropriate sections of the tree number tags are nailed to both ends of the one or sometimes two logs made from the felled tree. The logs are then winched to the skid trail by logfisher and from there are skidded by tractor to the landing.

At the landing log mid-diameter and length are measured and the LPI and CB tags are affixed at both ends of every merchantable log together with the hammer imprint of the licensee's property mark. The details of logs extracted are recorded on the Daily Production Return form which must be submitted to the Forest One-Stop Compliance Centre.

The logs are then trucked to the official stumping area (PORM) where the royalty assessment is undertaken by FDS. As part of the assessment the logs are hammer marked "FD" and a royalty tag is attached; this tag also identifies the log as being either for export or local use. A Removal Pass is then issued by FDS; this serves as the permit to legally transport the logs to the Tuyut log pond

management continues to assist UPM by providing logistical support and road access to the area and the FMU's surveyors and foresters participate in the fieldwork.

via the CTB stumping. It is the last link in the FMU's chain-of-custody: standing tagged tree to the official log pond.

Allowable Annual Cut

From the net production area of 50,079 ha in the FMU with an average of 2,003 ha per Annual Coupe, the resulting preliminary Annual Allowable Cut (AAC) is **50,400.00 m³/year**.

Yield control is primarily by area with one coupe harvested each year with the actual annual production not to exceed the AAC.

Provisions for monitoring forest growth

The establishment of a network of Permanent Sample Plots (PSPs) is in progress. The PSPs are selected from the FRA sampling units so as to represent the variability of the forest condition over the production area. It is planned that re-measurement will, initially, be at two-year intervals. The final number of PSPs to be established will depend on the variability (coefficient of variance) of the FRA sampling units. One (1) PSPs were re-measured as of August 2023. Mean Annual Increment recorded was 1.00 cm DBH. One new PSP was established in 2023 to increase the sampling size.

In compliance with DF Circular, a **tree nursery** has been established in the camp site and **restoration site** has been identified and planted with different species.

Silviculture management of the production forest aims primarily to sustain and ideally enhance productivity – at an economically acceptable cost. Enrichment planting (EP) will be considered after diagnostic sampling of the harvested blocks, relevant findings and the overall economics.

Environmental Safeguards

Environmental Impact Assessments (EIAs) were approved by Natural Resources and Environment Board (NREB) on 26 May 2010 and 8 June 2010 for T/0280 and T/9115 respectively.

The EIA reports include the study of environmental impact considerations, the conservation of the natural forest, water quality, waste disposal, use of pesticides and biological agents, mitigation measures for road construction and maintenance, tree felling and log skidding by tractors, environmental quality control and non-organic waste disposal, silvicultural management, forest protection/fire prevention, wildlife protection, protection of scenic landscapes and those with recreational potential, and safety and health of workers.

All rivers and streams that flow year-round must have stream buffer reserve (SBR) established the width of which is determined according to NREB specification.

Quarterly Environmental Monitoring Reports (EMRs) are undertaken by external consultants and have been submitted to the NREB regularly following approval of the EIA. The main focus of the Environmental Monitoring Report (EMR) is on water quality² and any damage arising from the harvesting operations. The monitoring works for damages due to harvesting operations, as

² Water monitoring results are shown on the website (click the Monitoring tab on the menu)

provided for under the Forest Ordinance, will continue for at least a year after the blocks are closed.

Fire Management Plan is an essential component for the prevention, suppression and management of fire within forests and adjacent lands. Fire management plan must be part of an overall land-use management plan, e.g. forestry. An effective fire management plan is highly dependent upon broad-based support from all stakeholders.

Climate change mitigation programs (e.g. REDD+) are emerging that can increase the stock of carbon in forests; and that can help the costs of actions (from Carbon Credits) to reduce GHG emissions due to deforestation and forest degradation. Forest management shall assess the cost-effectiveness of climate change adaption and mitigation options and identify the most feasible based on the available technical capacity and supportive policy.

Collaboration on Research

On 26th September 2022, the Samling Group has signed a Memorandum of Understanding (MOU) with UPM Sarawak Bintulu Campus on collaborative research projects related to forest management certification.

Rapid Assessment of Hornbills by Malaysian Nature Society (Kuching Branch)

The rapid assessment of hornbills was carried out in September and October 2022 with a total of five survey days. During the line transects and point counts, observation of birds were done based on sightings and calls. Eighty-six (86) species of birds were identified in the Ravenscourt FMU and thirty-four (34) species were recorded along the trail in Paya Maga. One of the notable findings was the Black Oriole *Oriolus hosii* which could be observed throughout the Ravenscourt FMU. Other wildlife sightings include the Hose's Langur *Presbytis hosei*, Bornean Striped Palm Civet *Arctogalidia trivirgata*, Yellow-throated Marten *Martes flavigula* and Gibbons which were frequently heard there. Reptile species seen opportunistically included the Oriental Vine Snake *Ahaetulla prasina*, Speckle-headed Vine Snake *Ahaetulla fasciolata* and King Cobra *Ophiophagus hannah*.

Bamboo Species Collection Program

Universiti Putra Malaysia Bintulu Sarawak Campus (UPMKB) are working with Sarawak Timber Industry Development Corporation (STIDC) to set up a bambusetum at UPMKB. The establishment of the bambusetum is to be the center of live collection of bamboo species. In order to increase the number of bamboo species in the bambusetum UPMKB and STIDC together with the ground support of Ulu Trusan FMU went to Ulu Trusan FMU on 1-5 August 2023 to collect bamboo species sample in the area.

Wildlife

"A Master Plan for Wild Life in Sarawak" was approved by the Cabinet as official policy in January 1997. The Master Plan dealt with the immediate issue of stopping over-exploitation by hunting and the provision of more natural habitats in which wildlife could continue to live. The principal ordinance relevant to the protection, management and conservation of wildlife in Sarawak is the Wild Life Protection Ordinance 1998. Additional measures are the responsibility of the FMU holder, in line with SFC Circular No. 2/2021 dated 21 April 2021, toolbox talks given to staff and

workers are designed to increase the level of awareness of the importance of all aspects of wildlife conservation. Posters are displayed at strategic location as visual aids for awareness programs.

Ulu Trusan FMU together with the adjoining Ravenscourt FMU play a role in the Heart of Borneo (HoB) Corridor Project through provision of a wildlife corridor between Sabah to the north-east, Brunei to the west, via the Mulu National Park and Buda National Park, and Indonesia to the south-east (see section on the high conservation value assessment). Ravenscourt FMU has common boundaries with Pulong Tau National Park, the proposed Batu Buli National Park and the proposed Batu Iran National Park.

There are existing trans-boundary collaborations between Pulong Tau National Park in Sarawak and Kayan-Mentarang National Park in Indonesia, and Batang Ai National Park, Lanjak-Entimau Wildlife Sanctuary in Sarawak and Betung Kerihun National Park in Indonesia.

Rainfall

The highest mean monthly rainfall is 89.4 mm at Long Tengoa in November to the lowest of 34.1 mm at Long Sukang in February. The highest annual total rainfall was 4,354.0 mm recorded at Long Tengoa in 2017 whereas the lowest annual total rainfall is 2,009.0 mm also recorded at Long Tengoa in 2020.

Overall, the wettest year in the region was in 2017 whereas the driest year was in 2019.

High Conservation Value Areas

A High Conservation Value assessment was completed by external consultants in early 2018 and is the subject of a separate report³. ([Right click here to access the Master HCV map showing the locations of HCV areas.](#)) Some salient points from the HCV report are noted below.

The FMU is separated from Brunei's Ulu Temburong National Park by the 1km wide international buffer zone (HCV 1.1). A part of the production area in the east of the FMU is separated from Sabah's Meligan Virgin Jungle Reserve by the proposed Paya Maga Conservation Area.

A number of HCV species are present: 37 species of fauna and 10 of flora were identified as rare or threatened or endangered (RTE) (HCV 1.2), and five species of fauna and 28 flora were identified as endemic (HCV 1.3). Areas of critical temporal use were also identified (HCV 1.4). The bat roost at Gg. Doa is well protected as it lies within the proposed Paya Maga Conservation Area; salt licks have been identified.

The FMU provides some linkage between other forest complexes as it adjoins forest timber licences (including Ravenscourt FMU), an ITP licence and it is partly within the HoB. (HCV 2).

Dipterocarp forest, most of it cut-over, covers the greater part of the FMU. This forest type is well represented in the 220,000 km² of the HoB and cannot be considered as endangered (HCV3). The upland kerangas forest has been accorded endangered status.

The altitude of the FMU ranges from 400m to 1,800m above sea level with the terrain generally hilly to mountainous. About 14% is TCIV - with slopes of more than 35° - and 70% is TCIII with

³ High Conservation Value Forest [sic] Report, Ulu Trusan FMU, Ling C. Y., *et al* February 2018

slopes of 20° to 35° (HCV 4.1). To maintain the integrity of the river systems buffer zones (RBZs) are mandatory for all permanent water ways. The width of the RBZ is determined by the width of the river or stream and is prescribed by NREB (HCV 4.2). Harvesting and all other mechanical activity are prohibited within RBZs.

The Sabah-Sarawak Gas Pipeline (SSGP) passes through the FMU. It is underground for the greater part of its length; this, together with reasonably evenly distributed monthly rainfall that averages annually in excess of 2,200mm, means that the pipeline should not be considered as a major fire hazard. (HCV4.3) However, rupture of the pipeline has occurred on more than one occasion (without fire) and the FMU must always be alert to its potential as a hazard. There should be a similar awareness of the adjoining LPF/0005. However, the adjacent area will not be planted for several more years to come.

The HCV report suggested that HCV 5 was present primarily in the provision of water catchment protection to safeguard a supply of clean water for domestic use. Most of the other services – provision of a supply of firewood, wild fruits and vegetables, building and handicraft materials – are sourced from nearby areas of old temuda and secondary forest. (Refer to the extract from the SIA quoted in an earlier section of this summary.) Hunting, generally with access by motorbike, is probably the only activity that makes use of the FMU's operational areas. Thus, provided that any water catchments within the active coupes are protected, the negative impact of harvesting (and of any other forest management operation) carried out in the FMU should be negligible.

A very positive impact is that of Samling's maintenance of a major part of the main road that leads from the Ravenscourt FMU to the Ulu Trusan FMU's Merarap camp and then north to the Samling log pond. This road also links with the sealed government road that leads to Lawas Town.

The FMU also provides employment for those with the relevant skills or who wish to be trained to obtain such skills.

The HCV report gives recommendations for the maintenance of the HCV attributes some of which are given below:

- Buffer zones should be maintained along the boundaries of TPAs.
- A buffer zone along the inter-state (Sarawak-Sabah) border and buffer along the international border (Sarawak-Brunei) should be maintained.
- The "No Hunting" policy should be maintained and enforced to the extent possible (although local residents are allowed to hunt for their own use.)
- The DF Circular No. 6/99 should be prominently posted to help reinforce the above.
- Critical temporal use areas and salt licks should be excluded from the operation area. Buffer zones must be established round such areas.
- The FMU is to be managed in such a manner that enables wildlife to move from one part of the forest to another as operations move from coupe to coupe.
- Boundaries adjacent to the conservation zones, terrain class IV and shifting cultivation area should be clearly demarcated on the map for reference.
- RIL harvesting techniques should be used.

That more than 40% of the FMU lies outside of the production area and most of that is in protected areas, e.g. SBRs, border buffer zones, conservation and steep areas, etc. This should

help to ensure that the existing populations of flora and fauna maintain their diversity within the FMU.

Local Community

The FMU will prioritize to engage with those villages which are located within the FMU for any untoward disputes that might arise and continue to practice to respect their user rights in a capacity as a FMU. It would be carried out without compromising the interests of other villages which are located adjacent and/or outside the FMU. The intention is to prevent any conflict with the neighbouring forest timber licences (FTLs) in term of community engagement process where those other villages may have associated to a particular FTL.

The **Social Impact Assessment** for the FMU was conducted by SFC from 6th to 18th September 2017 through field investigation and mapping by using structured interviews and questionnaire. Secondary information on the settlements was sourced from various departments and agencies such as Medical Clinics and District Office and the FMP were used to narrow the focus of a social assessment and to establish relevant framework and key social variable in advance.

The main ethnic group living inside and near to the FMU is the Lun Bawang. These Lun Bawang communities can be grouped into two clusters of settlements, each under a penghulu. The Lg. Sukang-Lg. Brayong Area is under Penghulu Meripa Tagal and the Lg. Luping Area - Lg. Semadoh Area comes under Penghulu Dennis Yahya Ading.

The location of the settlements adjacent to and inside the FMU is listed below: [\(Right click here to access Map G FMU location.\)](#)

| NO . | KAMPUNG | LOCATION IN FMU | ASSOCIATE COUPE |
|------|--------------------------|-----------------|-----------------|
| 1 | Long Resina | Adjacent | - |
| 2 | Pa' Dadar | | |
| 3 | Long Remirang | | |
| 4 | Long Lidung | | |
| 5 | Long Lutok | | |
| 6 | Long Sukang | | |
| 7 | Puneng Berayung | | |
| 8 | Berayung Tengah | | |
| 9 | Long Tuyo | | |
| 10 | Tang Pau | | |
| 1 | Long Merarap | Within | 7A |
| 2 | Long Meringau | | 9A |
| 3 | Long Luping | | 19A |
| 4 | Long Rereku / Long Namut | | 17A |
| 5 | Long Semadoh Rayeh | | 17A |
| 6 | Long Semadoh Naseb | | 17A |
| 7 | Long Semadoh Airport | | 17A |
| 8 | Long Telingan | | 24A |
| 9 | Puneng Trusan | | 24A |
| 10 | Long Kerebangan | | 17A |

| NO | KAMPUNG | LOCATION IN FMU | ASSOCIATE COUPE |
|----|-------------|-----------------|-----------------|
| 11 | Pa' Berunut | | 20A |
| 12 | Long Tanid | Adjacent | - |
| 13 | Long Beluyu | | |

Potential environmental and socio-economic impacts of the development of the FMU may remain even after mitigation measures are adopted and implemented. These are called the residual impacts that would require further monitoring and study. An understanding and knowledge of these residual impacts is necessary in defining the scope of work for monitoring purposes.

The KK@JKKK and FMU Liaison Committee should ensure that the concerns and grievances of the affected local communities are well addressed and resolved in a timely and satisfactory manner. Records of meetings and dialogues must be properly documented and filed to ensure transparency and accountability.

The frequency of reporting may be flexible depending on the occurrence of events such as meeting, dialogues, etc. The report shall be submitted to the top management after each event and it should be properly documented and filed. Submission to the authorities such as FFDS and SFC if deems necessary by the top management.

Local people residing around the FMU may choose to become workers – salaried or contract – and switch to the regulated life of loggers, especially among the younger generation. The increase in population of workers (local and foreign) living in the camp would create conditions that are conducive to the outbreak of communicable diseases and social conflicts.

In the land matter, new issues and claims may come up as the project work progresses. However, these could be avoided or managed if the mitigation measures recommended are properly and diligently implemented and followed.

Annual monitoring at the water catchment areas inside the FMU is strongly recommended to ensure the surrounding area and their buffer zones are safeguarded and to avoid any illegal tree felling activities. Apart from that, monitoring also should be conducted around the cultural and historical sites to ensure these areas are safeguarded.

Injuries in the logging industry are not uncommon. The management should seriously consider such hazards. Therefore, public health, occupational hazard and workplace safety should not be ignored. In terms of workers’ rights and benefits, some management practices have also been formulated to enhance certain positive or beneficial effects. Hence, some of the on-going practices are commendable and they should be continued and enhanced for the benefits of all people.

The Lg. Sukang cluster of settlements is applying to join FORMADAT (the Alliance of the Indigenous Peoples of the Highlands of Borneo). This is a trans-boundary, grassroots initiative which aims to increase awareness and understanding of the communities of the highlands; maintain cultural traditions; build local capacity and encourage sustainable development in the Heart of Borneo. This aim is to be achieved through community-based eco-tourism; organic farming and agro-forestry; communication and information technology and the preservation of the cultural and natural heritages of the highlands in a way that will benefit present and future

generations. The FORMADAT committee in Lg. Semadoh has set up a committee for Lg. Semadoh Rivers Conservation Project. The intention is that selected riverbanks in the vicinity of Lg. Semadoh will be protected from further erosion by local community activities using a “Local Tree and Bamboo Planting on Riverbank Programme” and “River Adoption and Protection Programme”, both of which are to be undertaken by community *gotong-royong* initiatives.

The Conflict Resolution Guidelines for SFM are used for resolution of any conflict that might arise between a community and the FMU management which cannot be resolved informally at FMU camp level.

On **27th June 2023**, a **Forest Management Certification Liaison Committee meeting** was conducted involving all three CRCs from the whole Lawas Region, Forest Department of Sarawak, Land and Survey Department, District Office Lawas and Syarikat Samling Timber Sdn Bhd. This leads to a fruitful conclusion and various department plays in village development.

Community Liaison and Development

The FMU Conservation and Community Development (CCD) Committee, Community Representative Committee (CRC) and SFM Liaison Committee serve as platforms for achieving a balance of the economic, environmental and social interests.

For the community development projects, the “help for self-help” principle is applied. Accordingly, the local community participate in, and are responsible for, those functions and activities of development measures that they can provide by their own means. Assistance for the community development project might come from FDS, the FMU holder and any agency (whether government or non-government) able to provide know-how and/or funds that are not otherwise available to the community.

Health, Safety and Environment

The FMU operates under Samling’s Health, Safety and Environment Policy and follows the Safe Practice Guidelines. In addition to their work instructions and toolbox talks, the workers are either sent for training courses, or trained within the FMU in the prescribed activities (directional felling, the proper usage of chainsaws and safety aspects, log extraction and log loading) by designated trainers. This is periodically reviewed. There is in-house training of occupational safety and health practices for the workers. A Safety and Health Committee ensures compliance with the Occupational Safety and Health Act 1994, and the relevant legislative regulations and guidelines that are applicable to the respective workplaces.

Monitoring

Social Impact Monitoring (SIM) were conducted in July, August and October for the year 2022 and from 13th June to 23rd June for the year 2023, to analyse the local’s perspective on the impact of harvesting activities on their daily lives. ([Right click here to access Map Q Location of settlement](#))

SIM conclude that all of the villagers are still very dependent on the forest nearby their villages to support their livelihood.

Logging operations have not only negatively affect the quality and quantity of water supply for community used, it also negatively affects the safety and health of the communities especially in terms of social crimes by the outsiders and road safety in their village areas.

Nevertheless, there are some advantages of logging operations to the communities that should be taken into consideration. This includes the benefits received by the communities after logging operations started in Ulu Trusan FMU. Some of the benefits received by the communities are, easily accessed logging road, incentives and donations, government and non-government development projects, and job opportunities to local communities.

On the matter of public awareness, most of the communities are not aware of the SFM, FMU, FMC, RIL, HCV, as well as FMCLC.

Reduced Impact Logging (RIL) compliance assessment was conducted in 2022 for a total of 19 blocks of Coupe 01A and the scores are **93%** compliance with RIL Guideline.

Post-Harvest Inventory (PHI) assessment was conducted in 2022 at **Coupe 01A Block 03**. A total number of 336 trees were assessed. Among 336 trees assessed, a total number of 49 tree species were identified, which includes 5 tree species of dipterocarp trees and 44 tree species of non-dipterocarp trees. Dipterocarp trees makes up 6% of overall tree species, which makes 94% of other trees are non-dipterocarp tree species. The majority of both dipterocarp and non-dipterocarp trees are of Tree B, followed by Tree A, Tree C, and Seedling. Last but not least, the majority of both tree groups are of Potential crop trees, followed by Fruit trees, Mother trees, and Protected trees.

During the year **2023**, the PHI assessment has been carried out at **Coupe 1A, Block 21**. Among 312 trees assessed, a total number of 34 tree species were identified, which includes 3 tree species of dipterocarp trees and 31 tree species of non-dipterocarp trees. Dipterocarp trees makes up 6% of overall tree species, which makes 94% of other trees are non-dipterocarp tree species. The majority of both dipterocarp and non-dipterocarp trees are of Tree B, followed by Tree A, and Tree C. Last but not least, the majority of both tree groups are of Potential crop trees, followed by Fruit trees, Mother trees, and Protected trees.

HCV monitoring was done in 2022 and 2023 via site visit and community participatory monitoring. According to the latest monitoring activity, **ALL** sites are in good condition.

Specifically addressing Item (d) of Criterion 8.2 are:

- **Yield:** The volume timber harvested from Ulu Trusan Coupe 01A is 34,294 m³. Out of 51 blocks, only 35 blocks were harvested, 5 blocks declare inoperable (Low Density) & 11 blocks not yet harvested (Stop Operation). The total area of 35 harvested block is 2,789 Ha. Therefore, the density of harvested timber is 12.34 m³/ha
- **Composition and Observed Changes in the Flora and Fauna**
Wildlife monitoring conducted using three main methods which are line transect, night spotting and camera trapping.

Line Transect

One line transect in Coupe 01A, Block 20 was re-assessed to monitor wildlife in the area. Result shows that the Shanon-Weiner Index calculated was 0.982. This is significantly less than other FMU that have been studied before. The Evenness Index calculated was 0.89. This shows that the area was not dominated by any particular species.

Night-spotting

Night time wildlife sighting was done to focus on nocturnal animals that are active at night. This is to balance the spectrum of wildlife sighted so that it does not favour diurnal or nocturnal animals. Data recorded are in the form of sightings per kilometre. The night spotting is done along the trail of M-4, 9.84 km in Ulu Trusan FMU. The result shows an average of 0.81 sightings per km.

Camera Trapping

A total of 4 wildlife sightings had been captured by the camera trap in the span of one month that was from 18 May 2023 until 18 June 2023. A total of 11 wildlife species had been recorded. Pig-tailed macaque is the most sighted animal species during monitoring, followed by Banded civet, while the other animal species occurred only once during monitoring. One (1) animal species is Totally Protected and five (5) animal species are Protected by Sarawak state based on the Wild Life Protection Ordinance 1998 (WLPO 1998).

- **Environmental:** Overall, it was observed that most of the environmental components were well maintained and in compliance to the NREB requirements. The water qualities of the waterway around the License Area were found to be within Class 1 to IIB of the NWQSM. No oil and grease were detected in the stream (Class 1). Generally, the water sampling exercise had not detected any major pollution.
- **Costs and Productivity of Forest Management**
Costs, Productivity and Forest management efficiency: Harvesting suspended since August 2021.
- **Growth Rates, Regeneration and Condition of the Forest**
A total number of 761 trees were assessed during PSP assessment for PSP No.7, 8, 10, 11, 16 and 17 in Ulu Trusan FMU. Among 761 trees assessed, a total number of 12 trees were identified as dipterocarp species, which are of Keruing, Lun (Yellow Meranti), Meranti Majau (Red Meranti), Meranti Pa'ang (White Meranti), and Resak species. The other 749 trees are non-dipterocarp.

Dipterocarp trees makes up 2% of overall tree species, which makes 98% of other trees are non-dipterocarp tree species. The majority of both dipterocarp and non-dipterocarp trees are of Tree B, followed by Tree A and Tree C.

A total number of 29 trees are dead, which makes up 4% of overall tree species.

The Mean Annual Increment (MAI) of PSP No.7 is 0.89cm DBH, PSP No.8 is 1.0cm DBH, PSP No.10 is 0.82cm DBH, and PSP No.11 is 0.77cm DBH. The overall recruitment in the dipterocarp for Class A and Class B were significantly lower at 8% as compared to non-dipterocarp for both class at 92%.

In 2023, one PSP (PSP 8) have been re-measured with average MAI of 1.00 cm. Other PSPs have yet to reach re-measurement period. One new PSP (PSP 8) was established to increase sampling size.

July 2023