

REVIEW ON BIODIVERSITY MONITORING PROTOCOL

IMPROVING CONNECTIVITY IN THE CENTRAL FOREST SPINE LANDSCAPE (IC-CFS)



Authors

Muhammad Syaridzwan Baharudin
Noor Faradiana Md Fauzi
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Editors

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Global Environmental Facilities (GEF)
United Nations Development Programme (UNDP)
Forest Research Institute Malaysia (FRIM)
Forestry Department Peninsular Malaysia (FDPM)
Improving Connectivity in the Central Forest Spine Landscape (IC-CFS)

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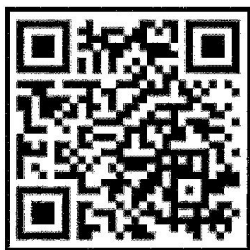
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1. *Muntiacus muntjak* - Shahfiz, M.A.
2. *Maxomys rajah* - Shahfiz, M.A.
3. *Pelobatrachyus nasutus* - Shahmirul, A.S.
4. *Etlingera coccinea* - Sam, Y.Y.
5. *Myrmicaria* sp. - Nur-Zati, A.M.
6. *Vindula dejone erotella* - Phon, C.K.
7. *Pragymnopleurus maurus* - Nur-Zati, A.M.
8. *Dryobalanops aromatica* - Shahfiz, M.A.

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FOREWORD

Biodiversity information is important in decision-making processes especially with respect to land-use changes. Under the Improving Connectivity in the Central Forest Spine Landscape (IC-CFS) project, a protocol named “Biodiversity Assessment and Monitoring Protocol in the Central Forest Spine Landscape” was published in 2021. This Protocol offers a simple guidance to measure, analyse and incorporate baseline data on biodiversity at the respective CFS linkages. Assessment of local-level biodiversity richness will enhance the decision making process.

This Protocol was presented during the CFS National Technical Committee Meeting on 8 July 2022. The chairman requested FRIM to review and determine the best mechanism for the Protocol to be adopted especially at the state level.

Therefore, it is aimed that this review process which involved experts from various disciplines, to suggest actions and way forward on mainstreaming this Protocol in line with criteria listed under national forest management certification standard, The Malaysian Criteria and Indicators (MC&I) for Sustainable Forest Management (SFM).

Dr. Lillian Chua Swee Lian

Advisor

IC-CFS Project for FRIM

EXECUTIVE SUMMARY

A meeting with biodiversity experts was held on 23 November 2022 at FRIM with several experts participating virtually. The aim of the meeting is to obtain technical comments on the Protocol and suggestions for the means of its implementation. The members comprised five biodiversity experts from Universiti Kebangsaan Malaysia, Universiti Teknologi MARA and Universiti Malaysia Terengganu, head of CFS Section JPSM, National Project Manager and FRIM secretariat.

The meeting was divided into two sessions, i.e., Technical Review (Session 1) and Means and Mechanism of Implementation (Session 2). The technical review highlighted several aspects that are lacking in the Protocol such as sampling frequency and period of monitoring, justification and prioritization of taxa, practicality of the Protocol's application across various habitats, and capacity building needs. The experts recommended to detail out the frequency of monitoring based on the capabilities of the state, provide justification on the taxa to be monitored and taxa prioritization based on the state's capacity, identify the habitats where the Protocol can be applied, and provide a guideline for capacity building program based on the state's demand.

The mechanism for the implementation focused on four aspects – human resources, finances, duration and data. The meeting noted that currently, there is no dedicated unit at the state level to undertake this initiative and the minimum manpower required to monitor each taxon is unclear. On finances, there is no costing detail provided for sampling/equipment/facilities required for monitoring. Issues on data revolved around data ownership, publication, and data management.

Since the situation at each state differs, the meeting agreed to conduct a pilot project to identify solutions for all four elements mentioned above. By having this pilot project, recommendations that are practical and applicable can be obtained with regards to co-management of the responsibilities of biodiversity monitoring with relevant stakeholders.

BACKGROUND

Improving Connectivity in the Central Forest Spine Landscape (IC-CFS) is a project funded by the Global Environmental Fund (GEF) to support the Central Forest Spine (CFS) initiative in Peninsular Malaysia. The goal of the project is to enhance sustainable forest landscape management in the Central Forest Spine landscape, securing critical wildlife habitats and conserving biodiversity. Forestry Department of Peninsular Malaysia (FDPM) is the main implementing agency. The Department of Wildlife and National Parks (DWNP) and Forest Research Institute Malaysia (FRIM) act as supporting implementing agencies.

In the IC-CFS project, FRIM is tasked to deliver Output 1.1.1, which is "*Federal and state-level decision-making tools strengthened for sustainable forest landscape planning and implementation.*" and Output 1.1.2, "*A monitoring tool for biodiversity, ecosystem services and carbon stocks developed and piloted*".

FRIM developed a protocol in 2021 entitled "Biodiversity Assessment and Monitoring Protocol in the Central Forest Spine Landscape" as part of the Output 1.1.2. The Protocol is a compilation of scientific methodologies designed to inventorise eight functional groups namely large mammals, small mammals, herpetofauna, dung beetles, ants, butterflies, tree and herbaceous plant species. The Protocol was tested at two CFS corridors; C-PL 1 : Tanum Forest Reserve, Pahang (Greater Taman Negara) – Sungai Yu Forest Reserve, Pahang (Main Range) and J-PL 2 : Panti Forest Reserve, Johor – Ulu Sedili Selatan Forest Reserve, Johor.

This Protocol was presented and accepted by the Johor CFS Technical Committee Meeting 2/2022 on 28 June 2022 (Appendix 1, Item 3.15). However, during the CFS National Technical Committee Meeting 1/2022 on 8 July 2022, the meeting requested FRIM to review the best mechanism for adoption of the Protocol that relates on sampling frequency, capacity, cost and data management (Appendix 2, Item 5.3).

A discussion with Mr. Rusli bin Tahir, Head of FDPM CFS Section took place on 5 August 2022 to discuss on how to address these comments (Appendix 3). An engagement session conducted on 9 August 2022 with Silviculturists from State Forestry Departments suggested that FRIM to seek guidance from their respective director before the commencement of the Conference of State Forestry Directors (Appendix 4, Item 4s). Later, the National Project Director urged FRIM to organize a meeting with five biodiversity experts to seek accreditation and recognition for the Protocol to be adopted. Therefore, the review process was conducted on 23 November 2022 at FRIM.

INTRODUCTION

1. The meeting was organized by FRIM and held on 23 November 2022 from 9.00 a.m to 1.30 p.m via physical and virtual modes. Chaired by Dr. Lillian Chua Swee Lian, (former Director of the Forest Biodiversity Division), the meeting comprised five biodiversity experts from Universiti Kebangsaan Malaysia, Universiti Teknologi MARA and Universiti Malaysia Terengganu (Appendix 5). The objectives of the meeting were to obtain:
 - a) Technical comments on the content of the Protocol; and
 - b) The means and mechanism to implement the Protocol at the state level.

2. The meeting commenced with the presentation on the Biodiversity Monitoring Protocol (Appendix 6) by Mr. Mohammad Shahfiz Azman, Project Focal Officer in FRIM, followed by a session dedicated to each of the above objective. Session 1 comprised technical review of the content, quality, universality and clarity of the Protocol while Session 2 dealt with the implementation mechanism focusing primarily on human resources, finance, duration and data management. The minutes of the meeting and attendance are attached as Appendices 5 and 7 respectively.

SESSION 1: TECHNICAL REVIEW OF THE PROTOCOL

The Thrust #2 of the Malaysia Policy on Forestry (2021) “Conservation of Forest Biodiversity”, has a strategy to improve knowledge and scientific documentation on forest biodiversity. In order to acquire and document detailed information on biodiversity for references in decision-making processes, there is a need to monitor the biodiversity at CFS landscape that contains both the forest reserve and the corridor itself. A protocol has been developed before in 2012 through Conservation of Biological Diversity through Improved Forest Planning Tools (CBioD), namely Perak Tool : Rapid Biological Diversity Assessment Manual. The main objective of Perak Tool is to monitor the effect and changes of pattern from logging activities. However, Perak Tools is unsuitable for areas such as peat swamp, mangrove and riverine areas. The review on the Biodiversity Monitoring Protocol highlighted issues and challenges (Part 1) and provided some recommendations (Part 2).

PART 1: ISSUES AND CHALLENGES

The issues and challenges associated with the Protocol are:

- 1) Lacking prioritization of the taxa to be monitored;
- 2) Lacking clear justification on why the taxa were selected;
- 3) No prioritization among CFS corridors;
- 4) The list of suitable habitats to implement the Protocol is not provided;

- 5) No clear sampling effort (e.g: sampling periods, frequency, number of sampling plots);
- 6) Insufficient biotic and abiotic parameters to model population changes in the CFS landscapes;
- 7) Usage of generated data are not clearly defined;
- 8) Lack of potential collaborators to assist the implementation of the Protocol; and
- 9) The Protocol has no cost-benefit analysis for the loss or degradation of biodiversity.

PART 2: RECOMMENDATIONS

The experts agreed that the Protocol as a tool to monitor the taxon of interest across the CFS linkages is valid and applicable. Their suggestions are as follows:

- 1) The content of the Protocol should be aligned with the latest *Pelan Induk Rangkaian Ekologi CFS* (2022; PIRE CFS) and fit to be used as a reference across all linkages;
- 2) The four taxa that should be prioritised are flora, large mammals, herpetofauna and dung beetles;
- 3) The Protocol can be tested at the linkages identified as threatened by PIRE CFS;
- 4) Where possible, the Protocol should also be used in Secondary Linkages. In the project, the Protocol was tested at two Primary Linkages namely J-PL2 and C-PL1.
- 5) Clear and detailed instructions on the sampling design, including sampling location, and sampling frequency should be provided. The sampling frequency has to be aligned to a planned timeline;
- 6) Parameters on biotic and abiotic will be added over time.
- 7) Specify the definitions in clear technical terms;
- 8) Identify capable agencies and collaborators to assist in data verification, interpretation and capacity building;
- 9) Cost-benefit analysis will only be provided once the data on biodiversity monitoring available.

SESSION 2: IMPLEMENTATION MECHANISM

In this session, issues regarding human resources, finances, duration and data management were covered (Part 1) followed by the recommendations (Part 2). Below are ten issues and challenges generated from the discussion.

PART 1: ISSUES AND CHALLENGES

1. Human resources
 - a) There is no dedicated unit in the State Forestry Department that is responsible for monitoring biodiversity changes;
 - b) Minimum number of manpower required for each taxon was not clearly stated in the Protocol;
2. Finance
 - a) Required cost involved for the monitoring was not included.
 - b) No clear mechanism to obtain continuous funding.
 - c) Financial implications to the state are not mentioned in the Protocol.
3. Duration
 - a) No clear timeline for monitoring on an annual basis;
 - b) Sampling effort related to number of traps, number of manpower per sampling trip was not specified.
4. Data management
 - a) Data storing, management, verification, analysis and translation was not clearly stated;
 - b) Agencies responsible to ensure data integrity, quality, maintenance and updating was not specified; and
 - c) Data sharing and publication co-ownership and rights were not clearly defined..

PART 2: RECOMMENDATIONS

Noting that there is currently no clear guidelines on how to implement the Protocol, matters related to the minimum number of manpower required, sampling effort, taxa prioritization and data verification cannot be addressed. As such, the meeting agreed to pilot the Protocol at other state and selected ecological corridor especially secondary linkages.

The “co-management” approach is also another possible solutions which may involve other stakeholders including academia. With the involvement of other relevant stakeholders, one can test the protocol at least at two or three CFS corridors within their areas.

From here, the ultimate outcome is knowledge and experience on best practices to implement the Protocol at the state level. Plus, involvement of various expertise during sampling and species identification, and increased manpower for sampling. It is recommended that at least four taxa, i.e. trees, large mammals, small mammals/herpetofauna and butterfly are tested during the pilot project at selected threatened linkages as identified in PIRE CFS 2022. It is anticipated that the output from the pilot project will provide recommendations to the issues and challenges raised.

To obtain the state’s commitment, a finance plan is particularly needed to factor in the financial implication of the Protocol’s implementation over time. For this purpose, FRIM should gather feedback from the State Forestry Department on human resources and financial capacity needed to implement the Protocol.

Finally, FRIM is advised to formulate a framework to mainstream the Protocol across all states in Peninsular Malaysia. In doing so, the monitoring method will provide valuable information on the biodiversity hotspots in the CFS landscape and trends of abundance and distribution change.

WAY FORWARD

The immediate next step is to scrutinize the comments from biodiversity experts and state silviculture officers as input for Jawatankuasa Penyelarasan Penyelidikan Perhutanan (JPPP) and Mesyuarat Majlis Urusan Hutan dan Silvikultur (MAJURUS) proposals.

REFERENCES

1. Jabatan Perancangan Bandar dan Desa (PLANMalaysia). 2022. *Pelan Induk Rangkaian Ekologi Central Forest Spine (PIRE CFS) 2022*. Putrajaya: Kementerian Perumahan dan Kerajaan Tempatan.
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MESYUARAT JAWATANKUASA TEKNIKAL PROJEK “CENTRAL FOREST SPINE” (CFS) DI NEGERI JOHOR BIL. 2/2022

Tarikh : 28 Jun 2022 (Khamis)

Masa : 2.30 petang

Tempat : **Bilik Mesyuarat Berlian,
Bahagian Perancang Ekonomi Negeri Johor,
Aras 1, Blok B,
Bangunan Dato’ Jaafar Muhammad,
Kota Iskandar, 79503 Iskandar Puteri, Johor.**

BIL.	PERKARA	TINDAKAN
1.	UCAPAN PENERUSI	
1.1	<p>Pengerusi memulakan mesyuarat dengan ucapan salam kepada semua ahli mesyuarat.</p> <p>Pengerusi juga telah merujuk kembali kepada minit Mesyuarat Jawatankuasa Teknikal Projek <i>Central Forest Spine</i> (CFS) Di Negeri Johor Bil. 1/2022 sekiranya terdapat sebarang pindaan. Minit mesyuarat yang lalu telah disahkan.</p>	Makluman
1.2	<p>Pengerusi memaklumkan berkaitan latar belakang mesyuarat yang bertujuan untuk memantau pelaksanaan aktiviti Projek <i>Improving Connectivity in the Central Forest Spine Landscape</i> (IC-CFS) di Negeri Johor, yang dibiayai oleh GEF melalui <i>United Nations Development Programme</i> (UNDP).</p>	Makluman
1.3	<p>Terdapat dua pembentangan oleh agensi:</p> <ul style="list-style-type: none"> ▪ <u>Institut Penyelidikan Perhutanan Malaysia (FRIM)</u> <ul style="list-style-type: none"> a. Protokol Pemantauan Biodiversiti Di Dalam Landskap <i>Central Forest Spine</i> (CFS) b. Rancangan Pengurusan Koridor Ekologi Central Forest Spine J-PL2: Hutan Simpan Panti – Hutan Simpan Ulu Sedili, Johor 2022 - 2030 <p>Pihak Institut Penyelidikan Perhutanan Malaysia (FRIM) merupakan salah satu agensi pelaksana bagi projek ini dan telah dipertanggungjawabkan untuk menghasilkan sebuah dokumen Rancangan Pengurusan Rangkaian Ekologi J-PL2: HS Panti – HS Ulu Sedili, Johor (2022-2030) serta Protokol Pemantauan Biodiversiti Di Dalam Landskap <i>Central Forest Spine</i>.</p>	Makluman
1.4	<p>Pembentangan ini bertujuan untuk pemakluman Protokol Pemantauan Biodiversiti, serta mendapatkan persetujuan, diperakui dan memuktamadkan penerimaan Rancangan Pengurusan Koridor Ekologi <i>Central Forest Spine</i> (CFS) Negeri Johor sebelum dibentangkan di dalam Mesyuarat Jawatankuasa Nasional Projek <i>Central Forest Spine</i> (CFS)</p>	Makluman

		pada 8 Julai 2022.	
	1.5	Pengerusi memohon kepada wakil agensi yang hadir untuk memberikan komen sebelum keputusan akhir diperakui dan mendapat persetujuan semua.	Makluman
2.	LAPORAN PROTOKOL PEMANTAUAN BIODIVERSITI DI DALAM LANDSKAP CENTRAL FOREST SPINE (CFS)		
	OLEH: INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA (FRIM)		
	2.1	Laporan dibentangkan oleh En. Mohammad Shahfiz Azman, Pegawai Penyelidik di Bahagian Biodiversiti Hutan, Institut Penyelidikan Perhutanan Malaysia (FRIM). Beliau turut memperkenalkan barisan ahli FRIM yang hadir bersama iaitu Pn. Noor Faradiana Md Fauzi, Pn. Nur Hajar Binti Zamah Shari dan Pn. Norhidayah Binti Abd Rashid.	Makluman
	2.2	Tujuan pembentangan adalah sebagai kertas pemakluman untuk diangkat ke Mesyuarat Jawatankuasa Nasional Projek CFS berkaitan Protokol Pemantauan Biodiversiti di Koridor Ekologi <i>Central Forest Spine</i> (CFS). Protokol ini telah diterbitkan pada tahun 2021 dengan penglibatan beberapa agensi utama seperti JPSM, Jabatan Perhutanan Negeri dan PERHILITAN. Protokol ini merangkumi beberapa kumpulan berfungsi seperti: <ul style="list-style-type: none"> ▪ Mamalia besar (PERHILITAN) ▪ Mamalia kecil (FRIM) ▪ Herpetofauna (FRIM) ▪ Kupu-kupu (FRIM) ▪ Kumbang Najis (FRIM) ▪ Semut (FRIM) ▪ Tumbuhan Herba (FRIM) ▪ Pokok (FRIM) Beliau memaklumkan bahawa kumpulan-kumpulan berfungsi ini dipilih kerana merupakan kumpulan sensitif atas sebarang perubahan di kawasan atau habitat tersebut.	Makluman

	<p>2.3 Antara objektif penyediaan protokol ini:</p> <ol style="list-style-type: none"> a. Dijadikan sebagai dokumen rujukan bagi pemantau biodiversiti di kawasan koridor b. Untuk menyediakan maklumat yang konsisten dan <i>standard</i> bagi pengumpulan maklumat biodiversiti c. Untuk mengenalpasti perubahan terhadap populasi dan komuniti di landskap CFS d. Untuk membina kapasiti kakitangan agensi lain <p>Beberapa aktiviti, kursus dan latihan telah dijalankan hasil atas kerjasama bersama pihak FRIM dan Jabatan Perhutanan Semenanjung Malaysia (JPSM). Pelaksanaan yang dijalankan melibatkan kakitangan FRIM, JPSM, Jabatan Perhutanan dan PERHILITAN Negeri terutamanya negeri Johor, Pahang dan Perak.</p>	Makluman
	<p>2.4 Selain itu, pembentang juga membandingkan perbezaan di antara Protokol Pemantauan Biodiversiti Di Dalam Landskap CFS ini dengan <i>Perak Tool: Rapid Biological Diversity Assessment Manual</i>.</p> <p>Dokumen ini diterbitkan menerusi Projek <i>Conservation of Biological Diversity through Improved Forest Planning Tools</i> (CBioD) pada tahun 2012. Dimaklumkan juga bahawa objektif utamanya adalah untuk memantau kesan dan corak perubahan daripada aktiviti pembalakan. Walau bagaimanapun, manual ini tidak sesuai untuk digunakan di kawasan paya gambut, bakau mahupun kawasan sungai yang berhutan.</p> <p><i>Perak Tool</i> melibatkan 8 kumpulan taxa:</p> <ul style="list-style-type: none"> ▪ Semut ▪ Kelawar Pemakan Serangga (tiada dalam protokol CFS) ▪ Kumbang Najis ▪ Pokok ▪ Rama-Rama (tiada dalam protokol CFS) ▪ Serangga Akuatik (tiada dalam protokol CFS) ▪ Kelulut (tiada dalam protokol CFS) ▪ Burung (tiada dalam protokol CFS) 	Makluman
3.	<p>LAPORAN RANCANGAN PENGURUSAN KORIDOR EKOLOGI CFS J-PL2: HUTAN SIMPAN PANTI - HUTAN SIMPAN ULU SEDILI</p> <p>OLEH: INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA (FRIM)</p>	
	<p>3.15 Pengerusi memaklumkan bahawa mesyuarat menerima maklum Protokol Pemantau Biodiversiti Koridor Ekologi CFS dan bersetuju untuk menerima Rancangan Pengurusan ini dan diangkat ke Mesyuarat Jawatankuasa Nasional pada 8 Julai 2022.</p>	Makluman

4.0	PENUTUP	
	<p>4.1 Pengerusi menengguhkan mesyuarat dan mengucapkan terima kasih semua ahli mesyuarat yang hadir secara fizikal.</p> <p>Pihak FRIM menyerahkan Buku Protokol Pemantauan Biodiversiti Di Dalam Landskap CFS dan Dokumen Rancangan Pengurusan Koridor Ekologi CFS J-PL2: Hutan Simpan Panti – Hutan Simpan Ulu Sedili kepada Pengerusi serta diikuti sesi bergambar.</p>	Makluman

DISEDIAKAN OLEH:



.....
 SHAZRUL AZWAN BIN JOHARI
 KOORDINATOR PROJEK IC-CFS NEGERI
 JABATAN PERHUTANAN NEGERI JOHOR

29 JUN 2022

DISEMAK OLEH:



.....
 EN. ABD RAMLIZ UYAHHUDIN BIN MAHLI
 TIMBALAN PENGARAH (PEMBANGUNAN)
 JABATAN PERHUTANAN NEGERI JOHOR



**MESYUARAT JAWATANKUASA TEKNIKAL NASIONAL PELAKSANAAN *CENTRAL*
FOREST SPINE (CFS) BIL. 1/2022**

MINIT MESYUARAT

Tarikh : 8 Julai 2022 (Jumaat)
Masa : 9.00 pagi
Tempat : Auditorium Chengal
Ibu Pejabat Jabatan Perhutanan Semenanjung Malaysia
Kuala Lumpur
Aplikasi : *Zoom Meeting*

**Ibu Pejabat Jabatan Perhutanan Semenanjung Malaysia
Kementerian Tenaga dan Sumber Asli**

5.3 Pembentangan Protokol Pemantauan Biodiversiti di Koridor Ekologi CFS oleh FRIM

Mesyuarat telah dibentangkan berkaitan Protokol Pemantauan Biodiversiti di Koridor Ekologi CFS yang disediakan oleh FRIM di bawah Projek IC-CFS. Perincian berkaitan pembentang adalah seperti di Lampiran 5. Protokol Pemantauan Biodiversiti ini bertujuan untuk menyediakan kaedah pencerapan data yang konsisten dan standart untuk mengenalpasti perubahan populasi didalam Koridor Ekologi CFS. Protokol pemantauan biodiversiti ini merangkumilapan (8) kumpulan taksa iaitu mamalia besar, mamalia kecil, herpetofauna, kupu-kupu, kumbang najis, semut, tumbuhan herba dan pokok. Hasil pemantauan tersebut kelak dapat membantu dalam memastikan rangkaian koridor ekologi boleh berhubung lantas membuktikan Malaysia serius kepada pemeliharaan hutan dan perlindungan biodiversiti serta program pemuliharaan di peringkat nasional. Mesyuarat mohon agar mekanisma pelaksanaan protokol pemantauan ini diperincikan dengan jelas seperti tempoh pelaksanaan, kekerapan dan seterusnya mendapatkan persetujuan daripada agensi pelaksana yang akan menggunakan protokol pemantauan biodiversiti tersebut di semua koridor ekologi terlibat.

Tindakan: FRIM

6.0 HAL-HAL LAIN

Tiada hal-hal lain yang dibangkitkan pada mesyuarat kali ini.

7.0 PENUTUP

YBhg. Dato' Indera Pengerusi mengucapkan terima kasih kepada semua yang telah menjayakan mesyuarat pada hari ini. Semua ahli mesyuarat dimohon untuk terus melaksanakan tindakan susulan kepada perkara-perkara yang telah dibincangkan dalam mesyuarat pada hari ini. Seterusnya, YBhg. Dato' Indera Pengerusi memohon untuk semua agensi dan JPN yang menerima peruntukan projek agar dapat melaksanakan semua aktiviti yang telah ditetapkan tanpa pemulangan. Perihal ini juga adalah

merupakan kayu pengukur kepada pelaksana projek yang mana pengurusan yang baik dan berjaya memperlihatkan kesungguhan dan memastikan peruntukan susulan bagi Rancangan Malaysia yang seterusnya. Mesyuarat ditangguhkan pada jam 12.30 tengahari.

Disediakan oleh:

Uru Setia

Mesyuarat Jawatankuasa Teknikal Nasional Pelaksanaan *Central Forest Spine*
(JTNP- CFS)

Seksyen *Central Forest Spine*,

Bahagian Pengurusan Hutan

Ibu Pejabat Jabatan Perhutanan Semenanjung Malaysia

NOTA RINGKAS
PERBINCANGAN FRIM DAN JPSM BERKENAAN HALA TUJU PERLAKSANAAN
PROTOKOL PEMANATAUAN BIODIVERSITI DI LANDSKAP CENTRAL FOREST SPINE DI
BAWAH PROJEK IC-CFS

BILIK MESYUARAT DURIO, FRIM
5 OGOS 2022
10.30 PAGI - 2.30 PETANG

AHLI MESYUARAT :

NO	NAMA	AGENSI
1	En. Mohammad Shahfiz Azman (Pengerusi)	Ketua Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM <i>Focal officer IC-CFS FRIM</i>
2	En. Rusli bin Tahir	Ketua Seksyen Central Forest Spine, Bahagian Pengurusan Hutan, JPSM
3	Cik Izaidah binti Talib	Penolong Pengarah (Pemantauan dan Pengembangan), Seksyen Central Forest Spine, Bahagian Pengurusan Hutan, JPSM
4	Pn. Dionysia binti Modingin	Penolong Pengarah (Kawalan Sumber Maklumat), Seksyen Central Forest Spine, Bahagian Pengurusan Hutan, JPSM
5	Cik Noor Faradiana Bt Md Fauzi	Pegawai Penyelidik, Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM
6	En. Muhammad Syaridzwan bin Baharudin	Pegawai Penyelidik, Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM
7	Pn. Norleyana Binti Azman	Pembantu Penyelidik, Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM

1. Pendahuluan

Encik Mohammad Shahfiz Azman selaku Pengerusi berterima kasih En Rusli Tahir dan pegawai-pegawai dari Seksyen CFS, IPJPSM kerana sudi hadir ke perbincangan ini. Pengerusi telah memberi penerangan ringkas berkaitan tujuan perbincangan kepada semua hadirin. Tujuan perbincangan adalah;

- a. Mendapatkan input dan nasihat daripada pihak JPSM berkenaan mekanisma yang sesuai bagi pelaksanaan Protokol Pemantauan Biodiversiti di landskap CFS.
- b. Platform dan kaedah/strategi yang perlu dilaksanakan bagi mendapatkan sokongan/ kelulusan untuk pelaksanaan Protokol Pemantauan Biodiversiti di landskap CFS daripada pihak berkuasa negeri.

2. Pengerusi memaklumkan bahawa bagi memenuhi pencapaian *milestone* MTR IC-CFS, Protokol Pemantauan Biodiversiti ini perlu dibentangkan dan mendapat kelulusan/sokongan di peringkat negeri/persekutuan/exco. Berikut adalah perkara berkaitan yang dibincangkan;

- a. En. Rusli Tahir mencadangkan satu kertas pertimbangan berkaitan Protokol Pemantauan Biodiversiti disediakan dan dibentangkan semasa Mesyuarat Pengarah-pengarah Perhutanan Negeri (PPN) yang dijangka akan diadakan pada pertengahan September 2022 di IPJPSM.
- b. Tarikh akhir penyerahan kertas pertimbangan (pendaftaran tajuk dan ringkasan) kepada sekretariat PPN: 15 Ogos 2022
- c. Carta alir hala tuju kertas pertimbangan: Mesyuarat PPN > J/K Pemandu CFS > MM
- d. Berdasarkan draf kertas maklumat yang telah disediakan berkaitan Protokol Pemantauan Biodiversiti yang akan dibentangkan semasa MBN, sekretariat telah memohon IPJPSM untuk memberikan ulasan. Berdasarkan perbincangan bersama pegawai di Seksyen CFS, seharusnya kertas ini dibentangkan terlebih dahulu di peringkat negeri bagi memudahkan proses kelulusan dan pelaksanaan.

3. Penyediaan kertas pertimbangan Protokol Pemantauan Biodiversiti;

- a. Antara perkara-perkara yang dicadangkan untuk disertakan ke dalam kertas pertimbangan ini ialah keperluan pelaksanaan; implikasi kewangan; implikasi pelaksanaan; faedah kepada jabatan/negeri; anggaran unjuran bajet bagi aktiviti pemantauan.
- b. En. Rusli Tahir mencadangkan kepada pihak FRIM untuk mengadakan satu perbincangan bersama pegawai-pegawai Jabatan Perhutanan dari Unit Silvikultur di peringkat negeri yang terlibat dengan projek CFS bagi mendapatkan input untuk pemurnian kertas pertimbangan ini sebelum dibentangkan ke Mesyuarat PPN.
- c. Pihak FRIM menyokong perbincangan ini untuk diadakan. Tentatif perbincangan adalah dicadangkan pada 9.30 pagi, 9 Ogos 2022 (Selasa), secara atas talian. Jemputan akan diuruskan oleh Cik Izaidah Talib (IPJPSM) dan butiran lanjut berkenaan perbincangan ini akan dimaklumkan kemudian.
- d. Templat/ccontoh dan kaedah pengisian isi kandungan kertas pertimbangan ke Mesyuarat PPN telah dikongsikan oleh pihak JPSM kepada pihak FRIM.
- e. Pengerusi turut mencadangkan untuk mengadakan perbincangan bersama beberapa pengarah perhutanan negeri, NPD dan Dato' Indera KPPSM berkenaan Protokol Biodiversiti sebagai usaha untuk mendapat sokongan awal sebelum dibentangkan di dalam Mesyuarat PPN. Perkara ini dipersetujui oleh En. Rusli Tahir dan wakil JPSM yang lain.

4. Cadangan mekanisme pelaksanaan Protokol Pemantauan Biodiversiti;

- a. Protokol ini dicadangkan secara kajian rintis (*pilot study*) sebagai permulaan; pihak JPSM diperingkat persekutuan dan negeri bertindak selaku Jawatankuasa Pengurusan (*Lead*); dan pihak FRIM selaku Jawatankuasa Teknikal (*Lead*). Model yang dicadangkan ini adalah sepertimana projek TESSA yang sedang dijalankan oleh SEARPP bersama JPN yang dibiayai oleh Yayasan Hasanah.
- b. Lokasi kajian rintis: Empat kawasan RE atau sekitar RE
 - i. Kelantan (TLC)
 - ii. Perak (Lombong)
 - iii. Pahang (Chini Man and Biosphere, MAB)
 - iv. J-PL2 Panti FR-Ulu Sedili FR, Johor (pemantauan berterusan jangka panjang)
- c. Tempoh kajian rintis: 3 tahun
- d. Cadangan peruntukan: Geran MPOGCF/mana-mana yang berkenaan
- e. Justifikasi kajian rintis:
 - i. Menurut pandangan En. Rusli, setelah Pengerusi menerangkan kaedah pelaksanaan

protokol tersebut, beliau merasakan ianya akan menjadi tambahan kerja kepada kakitangan sedia ada dan beliau merasakan ianya tidak berdaya laksana samada di peringkat persekutuan mahupun negeri.

- ii. Maka, kertas pertimbangan ini menjurus kepada cadangan pelaksanaan protokol ini secara kajian rintis di lokasi RE terpilih bagi menjawab beberapa persoalan berkaitan mekanisma pelaksanaan seperti kapasiti sumber manusia yang kompeten mengenai maklumat biodiversiti yang ingin diperolehi termasuk kadar kekerapan pengumpulan data serta bilangan kumpulan taksa yang perlu diutamakan.
 - iii. Menerusi kajian ini, dijangka satu bentuk task force dapat diwujudkan di peringkat negeri
- f. Selain kajian rintis, sebagai alternatif, En. Rusli mencadangkan agar protokol ini dilaksanakan oleh pihak ketiga yang dilantik oleh pihak berkuasa negeri menggunakan geran *Ecological Fiscal Transfer* (EFT), yang memfokuskan kepada kawasan-kawasan yang mempunyai projek berimpak besar seperti perlombongan, TLC dan kuari. Maka, berdasarkan maklumat yang dijana oleh pihak ketiga (*independent assessor*), pasukan *task force* di peringkat negeri berkebolehan untuk menyemak dan menentusahkan maklumat-maklumat yang disalurkan.

5. Perbincangan ditangguhkan pada jam 2.30 petang.

NOTA PERBINCANGAN

**MESYUARAT PENYELARASAN DAN PENYEDIAAN CADANGAN KERTAS KERJA BAGI
PERSIDANGAN PENGARAH-PENGARAH PERHUTANAN NEGERI SEMENANJUNG MALAYSIA
(PPNSM): KE ARAH PELAKSANAAN PROTOKOL PEMANTAUAN BIODIVERSITI DALAM
RANGKAIAN EKOLOGI CENTRAL FOREST SPINE (CFS) DI PERINGKAT NEGERI**

PLATFORM GOOGLE MEET

**9 OGOS 2022
9.30 A.M - 12.30 P.M**

AHLI MESYUARAT:

NO	NAMA	AGENSI
1	En. Rusli Bin Tahir (Pengerusi)	Ketua Seksyen <i>Central Forest Spine</i> , BUH, IPJPSM
2	Cik Izaidah binti Talib	Penolong Pengarah (Pemantauan dan Pengembangan), Seksyen <i>Central Forest Spine</i> , Bahagian Pengurusan Hutan, IPJPSM
3	Pn. Dionysia binti Modingin	Penolong Pengarah (Kawalan Sumber Maklumat), Seksyen <i>Central Forest Spine</i> , Bahagian Pengurusan Hutan, IPJPSM
4	Dr. Lillian Chua Swee Lian	Pengarah Bahagian Biodiversiti Hutan, FRIM
5	En. Mohammad Shahfiz Azman	Ketua Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM <i>Focal officer IC-CFS FRIM</i>
6	Cik Noor Faradiana Bt Md Fauzi	Pegawai Penyelidik, Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM
7	En. Muhammad Syaridzwan bin Baharudin	Pegawai Penyelidik, Cawangan Zoologi, Program Biodiversiti Fauna, Bahagian Biodiversiti Hutan, FRIM
8	Dr. Agkillah Maniam	State Project Coordinator Perak, JPN Perak
9	En. Mohd Nor Firdaus bin Rahim	Penolong Pengarah (Arboretum) Seksyen Kepelbagaian Biologi Hutan, BSB, IPJPSM
10	Tuan Haji Helmy Tariq bin Othman	Penolong Pengarah Kanan (Pembangunan), JPN Terengganu
11	En. Mohd Hazlan bin Abd. Aziz	Penolong Pengarah Pengurusan, JPN Kedah
12	Pn. Wan Zaizielawany binti Wan Muhamad Zin	Penolong Pengarah Silvikultur (Zon Pahang Timur II), JPN Pahang
13	En. Mohamad Syahmil bin Sukawai	Penolong Pegawai Pengurusan, JPN Johor
14	En. Syed Mohd Adzha bin Syed Khalid	Ketua Seksyen Perancangan dan Pensijilan Hutan, JPN Selangor
15	Melati bin Yusof	Penolong Pengarah (Perancangan dan Pensijilan Hutan), JPN Kelantan

Pendahuluan

1. En Rusli Tahir selaku Pengerusi berterima kasih kepada pihak FRIM dan pegawai-pegawai dari Jabatan Silvikultur dari jabatan-jabatan perhutanan negeri kerana sudi hadir ke perbincangan ini. En Rusli telah menjelaskan agenda perbincangan kepada ahli mesyuarat, iaitu :
 - a. Pembentangan pemakluman kepada ahli mesyuarat mengenai Protokol Pemantauan Biodiversiti.
 - b. Mendapatkan input dan nasihat daripada pihak Jabatan Perhutanan Negeri berkenaan mekanisma yang sesuai bagi pelaksanaan Protokol Pemantauan Biodiversiti di landskap CFS.
 - c. Platform dan kaedah/strategi yang perlu dilaksanakan bagi mendapatkan sokongan/kelulusan untuk pelaksanaan Protokol Pemantauan Biodiversiti di landskap CFS daripada pihak berkuasa negeri.
2. Pengerusi memaklumkan bahawa salah satu pencapaian key milestone MTR IC-CFS perlu dicapai pada akhir Disember 2022 oleh FRIM, iaitu Protokol Pemantauan Biodiversiti perlu dibenteng dan mendapat kelulusan di peringkat negeri persekutuan. Pengerusi memaklumkan bahawa Protokol Pemantauan Biodiversiti telah dihasilkan dan dibentangkan sebagai kertas pertimbangan di Mesyuarat Jawatankuasa Teknikal Nasional Pelaksanaan Central Forest Spine (JTNP-CFS) Bil.1/2022 pada 8 Julai 2022 yang telah dipengerusikan oleh Dato' Indera Mohd Ridza Bin Awang selaku Ketua Pengarah Perhutanan Semenanjung Malaysia.
3. Salah satu aspirasi daripada Dato' Indera mengenai Protokol ini ialah cara-cara pelaksanaan dan aspek kewangan Protokol ini di peringkat negeri.

Isi Perbincangan

4. Agenda diteruskan dengan pembentangan mengenai Protokol Pemantauan Biodiversiti oleh En Shahfiz Azman. Antara cadangan yang telah disertakan dalam pembentangan ini ialah :
 - a. Rangka kerja bagi cadangan pelaksanaan kajian rintis merangkumi mekanisma pelaksanaan, agensi-agensi pelaksana, unjuran perbelanjaan, dana peruntukan dan pemilik data.
 - b. Cadangan bagi unit yang akan bertanggungjawab bagi pelaksanaan Protokol di peringkat ini ialah Unit Silvikultur dan Pemeliharaan Biologi Hutan peringkat negeri.
 - c. Agensi pelaksana utama ialah JPSM dan FRIM yang akan bertindak sebagai agensi teknikal. Agensi pelaksana di peringkat negeri pula terdiri daripada empat agensi, iaitu JPN Perak, JPN Pahang, JPN Johor dan JPN Kelantan.
 - d. Anggaran perbelanjaan bagi tempoh tiga tahun untuk pemantauan satu kumpulan taksa di satu kawasan kajian pula ialah RM 1,028,285.00.
 - e. *Malaysian Palm Oil Green Conservation Fund* (MPOGCF) sebagai dana peruntukan bagi kajian rintis ini dan JPSM akan bertindak sebagai pemohon

- dana.
- f. Jabatan Perhutanan Semenanjung Malaysia dipilih sebagai pemilik data.
 - g. Pembentukan satu *task force* khusus untuk pemantauan biodiversiti di dalam dan kawasan sekitar rangkaian ekologi CFS.
5. Maklumbalas daripada ahli mesyuarat terhadap cadangan-cadangan yang telah dibentangkan ialah :
- a. En Firdaus menyatakan bahawa BSB menerima pakai konsep *Rapid Biodiversity Assessment* (RBA) yang diambil daripada *Perak Tool* dan fokus kepada tiga taksa sahaja iaitu kelawar, semut dan kumbang najis. En Firdaus bersetuju dengan cadangan lapan taksa yang disenaraikan dalam Protokol Pemantauan Biodiversiti. Antara kekangan semasa pemantauan tiga taksa di BSB ialah kebolehpayaan staf lapangan dalam pengenalanpastian spesies serta bilangan staf yang tidak mencukupi untuk membawa alat-alat persampelan ke lapangan.
 - b. En Helmy memberi beberapa komen mengenai tajuk kertas ini. 1) definisi Protokol Pemantauan Biodiversiti perlu disertakan. 2) pihak FRIM perlu sertakan apakah aset ekologi yang dimaksudkan. 3) nyatakan apakah tindakan-tindakan untuk memperkasa pengurusan aset ekologi. Seterusnya, perlu nyatakan dengan jelas matlamat kertas ini serta aktiviti yang akan dilakukan. Tajuk yang dicadangkan tidak menepati dengan intipati pembentangan mesyuarat ini. Adalah dicadangkan juga kertas ini tidak perlu terlalu teknikal mengenai taksa-taksa dalam Protokol ini.
 - c. Dr. Lillian menerangkan secara ringkas kandungan protokol ini untuk meningkatkan pemahaman ahli mesyuarat.
 - d. En Helmy menekankan kekangan dari segi bilangan staf kerana renjer di jabatan telah mempunyai tugas sedia ada dan kebanyakannya ditempatkan di peringkat daerah. Isu penambahan tugas perlu diambilkira.
 - e. En Helmy mengesyorkan bahawa perlu lebih menerangkan tentang pelaksanaan latihan kepada staf lapangan serta bantuan-bantuan daripada segi peruntukan dan tenaga kerja.
 - f. Dr Agkillah menyatakan bahawa terdapat kemahiran di pihak JPN Perak untuk melaksanakan Protokol ini, namun perlu mengambil kira *Standard Operation Procedure* (SOP) yang sedia ada di peringkat jabatan negeri. Aspek seperti *transition period* dan penjelasan bagaimana pelaksanaan Protokol ini akan meningkatkan kualiti kerja staf lapangan perlu diperjelaskan lagi.
 - g. SOP semasa yang digunakan oleh JPN Perak ialah Post-F & Pre-F serta *High Conservation Value Forest* (HCVF). Biodiversiti tidak menjadi satu alat spesifik semasa proses inventori hutan, namun akan dilaksanakan mengikut keperluan sahaja. Dr Agkillah mengesyorkan perlunya satu *review* dijalankan ke atas SOP sedia ada untuk memberi ruang kepada penerimaan pelaksanaan Protokol ini.
 - h. En Rusli menerangkan sistem Pre-F & Post-F banyak berfokus kepada bancian pokok berkayu sahaja dan bukan kepada biodiversiti. Jika terdapat tumbuhan herba di dalam petak bancian, ianya akan direkodkan.
 - i. Dr Lillian menyatakan bahawa hanya sebahagian taksa seperti Pokok dan Tumbuhan Herba dari protokol ini sedang digunapakai dalam proses bancian untuk memenuhi keperluan SMS.
 - j. En Rusli menerangkan petak bancian Post-F & Pre-F hanya dibentuk di hutan

- pengeluaran sahaja. Petak ini tidak dibentuk di jenis hutan lain seperti hutan perlindungan, hutan lipur dan di dalam Rangkaian Ekologi.
- k. En Rusli mencadangkan kepentingan setiap taksa yang dipilih perlu dimasukkan ke dalam kertas pertimbangan (peranan taksa sebagai indikator keadaan hutan, etc).
 - l. Dr Lillian menjelaskan bahawa metodologi yang disertakan dalam Protokol ini boleh dijadikan metodologi standard di peringkat awal dan akhir inventori biodiversiti ini dijalankan.
 - m. Dr Lillian juga menegaskan bahawa metodologi dalam protokol ini sesuai untuk digunakan di mana-mana lokasi.
 - n. En Rusli mencadangkan agar integriti semasa proses pengumpulan data perlu diambil kira (kebolehan staf lapangan untuk melakukan identifikasi spesies dengan betul).
 - o. En Rusli memberi cadangan bahawa JPSM akan memperhalus kertas ini dan akan merujuk dengan *National Project Director IC-CFS* untuk mendapatkan pandangan.
 - p. En Syafuan menjelaskan bahawa Pahang kekurangan tenaga kerja dan kemahiran dalam menjalankan inventori biodiversiti. Sistem Post-F & Pre-F di Pahang merangkumi persampelan pokok palma, resam, tanah dan air dalam kawasan hutan pengeluaran.
 - q. En Syafuan mencadangkan agar pihak FRIM mengambil kira kerjasama bersama Majlis Biodiversiti Pahang yang baru sahaja ditubuhkan untuk pelaksanaan Protokol ini. Pemakluman awal telah diberikan kepada pegawai-pegawai di Majlis Biodiversiti Pahang dan Bahagian Perancang Ekonomi Negeri Pahang oleh En Syafuan.
 - r. En Rusli mencadangkan agar pendekatan *outsource* pelaksanaan Protokol dilakukan dengan menggunakan dana MPOGCF di bawah pemantauan peringkat persekutuan (JPSM dan FRIM). Pendekatan ini dapat mengurangkan bebanan kepada negeri.
 - s. En Firdaus menyatakan bahawa pendekatan *outsource* juga digunapakai di Unit Silvikultur JPSM.
 - t. En Syahmil (JPN Johor) mencadangkan data yang diperolehi dari ekspedisi yang akan dilakukan di Hutan Simpan Panti dimasukkan ke dalam protokol
 - u. En Syed Adzha ingin mendapat penjelasan mengenai tiga perkara : 1) perbezaan projek TESSA dan pelaksanaan protkol ini; 2) praktikaliti dan penentuan plot-plot agak sukar kerana melibatkan banyak tanah persendirian di kawasan koridor ekologi SL; 3) cara untuk melibatkan agensi luar dalam pelaksanaan Protokol (komuniti, penyelidik di IPT, perunding).
 - v. En Rusli mencadangkan agar protokol ini dapat digunakan di kelapan-lapan negeri yang terlibat dengan CFS.
 - w. Dana MPOGCF lebih sesuai daripada *Ecological Fiscal Transfer* (EFT) kerana pihak persekutuan dapat memantau penggunaan dana tersebut.
 - x. Cadangan untuk memasukkan garis masa pelaksanaan bagi tempoh 5 tahun.
 - y. Aktiviti berkaitan pelaksanaan protokol yang telah dilaksanakan seperti Bengkel Pemantauan Biodiversiti yang telah dilaksanakan di FRIM pada 28 Mac - 1 April 2022 perlu diletakkan di bahagian “Latar Belakang”.
 - z. Dr Lillian mencadangkan agar pengenalan protokol boleh dilakukan kepada Pengarah-Pengarah Negeri sebelum mesyuarat PPN.

- aa. En Rusli mencadangkan agar kod QR disertakan dalam kertas ini bagi membolehkan Protokol ini dimuat turun jika tiada ruangan untuk memperkenalkan protokol kepada pengarah-pengarah negeri sebelum mesyuarat PPN.

6. Perbincangan ditangguhkan pada jam 12.30 tengahari.

MINUTES OF THE MEETING

MEETING WITH BIODIVERSITY EXPERTS FOR IMPLEMENTATION OF BIODIVERSITY MONITORING PROTOCOL AT CFS LANDSCAPE UNDER UNDP/GEF/GOM: IMPROVING CONNECTIVITY IN THE CENTRAL FOREST SPINE LANDSCAPE (IC-CFS)

Time : 9.00 a.m -1.30 p.m

Date : 23 November 2022

Venue : Licuala Meeting Room, Auditorium, FRIM

NO.	NAME	AGENCIES
1.	Dr. Lillian Chua Swee Lian	Director of Forest Biodiversity Division, FRIM (Chairman)
2.	Mr. Shahfiz bin Azman	Head of Zoology Branch, FRIM
3.	Mr. Rusli bin Tahir	Head of Central Forest Spine Section, FDPM
4.	Dr Samsudin bin Musa	National Project Manager of IC-CFS Project
5.	Mr. Muhammad Syaridzwan Bin Baharudin	Research Officer, Zoology Branch, FRIM
6.	Ms. Noor Faradiana binti Md Fauzi	Research Officer, Zoology Branch, FRIM
7.	Ms. Nor Hazwani binti Ahmad Ruzman	Research Officer, Zoology Branch, FRIM
8.	Mrs. Norleyana binti Azman	Research Assistant, Zoology Branch, FRIM
9.	Prof. Emeritus Dato' Dr. Abdul Latiff Mohamad	Research Fellow, Faculty of Science and Technology, UKM
10.	Prof. Dato' Dr. Mohd Tajuddin bin Abdullah	Professor, Faculty of Fisheries and Food Sciences, UMT
11.	Prof. Ts. Dr. Mohd Nazip Suratman	Professor, Faculty of Applied Science, UiTM
12.	Prof. Dr. Norhayati Ahmad	Professor, Faculty of Science and Technology, UKM
13.	Prof. Madya Dr. Salmah binti Yaakop	Professor, Faculty of Biological Sciences and Biotechnology, UKM

NO	MATTERS
1.1 Introduction to “Biodiversity Assessment and Monitoring Protocol at CFS Landscape”	
	<p>1.1.1 Dr. Lillian gave an opening remarks regarding the Biodiversity Monitoring Protocol, output and outcome of IC-CFS project and appreciate the presence of all experts to this meeting.</p> <p>1.1.2 En. Shahfiz presented the introduction of Biodiversity Monitoring Protocol to all meeting members.</p>
1.2 Session 1 : Technical Review of the Protocol	
	<p>1.2.1 Prof. Dr. Abdul Latiff pointed out about lack of details on baseline data, period and frequency of monitoring, the contingency during monitoring, and subsequent analysis on the data to come out with some trend of changes. Prof. Latiff highlighted other groups of plant such as epiphytes, saprophytes, parasites and lianas to be important component of forest. In addition, Prof. Latiff commented on the availability of the future plan after years of monitoring. Other matter highlighted is the importance of the training of the field personnel to implement of this protocol.</p> <p>1.2.2 Prof. Tajuddin agreed on several comments by Prof. Latiff. Prof. Tajuddin suggested the possibilities of application of current technologies during monitoring process. Prof. Tajuddin suggested the data generated should be published in technical and interactive manner. He suggested to have a plot somewhere near urban, plantation and rural area to have some ideas of how good is the CFS compared to developed area.</p> <p>1.2.3 Dr. Lillian that collected from this monitoring should be subjected to prediction modelling of population changes in certain scenarios happened in CFS landscape. Dr. Lillian acknowledged Prof. Tajuddin’s suggestion on establishing plot on non-natural forest setting, where this Protocol has already covered it in the Sampling Design. FRIM purposely created two major plot environment; natural forest and CFS landscape itself. Half of the plot established at three CFS landscapes under IC-CFS project are inside of land-used area (stateland forest).</p> <p>1.2.4 Prof. Tajuddin suggested that plot can be established at cocoa, rubber and oil palm plantation to find out whether this isolated forest will become refugia for the selected taxa in the protocol.</p> <p>1.2.5 Dr. Lillian express her hope that this protocol can be translated into Program Rancangan Malaysia or under CFS funding mechanism.</p>

1.2.6 Prof Norhayati inquire regarding why J-PL2 is chosen. Mr. Shahfiz explained that CFS project is a subset from the CFS Master Plan by PLANMalaysia in 2010 consisting eight states. Johor has identified four ecological corridors and one of it is J-PL2. The idea is to protect the tiger roaming area.

1.2.7 Dr. Lillian stated that there is a past data that shows large mammals are actively roaming at this area. The CFS support the NTCAP by focusing on the corridors.

1.2.8 Prof. Norhayati pointed out the distance between the Pantli FR and Ulu Sedili FR is quite far, considering other land-use activities that occur in the corridor. Dr Lillian replied that the inventory should cover all parts of the corridor, not just partially.

1.2.9 Dr. Salmah inquired regarding how much correction can be made on the technical parts, lacking justification on why the certain insect groups chosen, and some terminologies need to be revised. Dr. Lillian acknowledged and FRIM will review how much changes can be made. The justification aspect is suggested to be included under the introductory chapter.

1.2.10 Mr. Shahfiz explained that the group is chosen based on the capacity at FRIM's side, landscape and the type of habitats available in the corridor. The primates or arboreal species is excluded because the corridors are so huge and has numerous activities happening in between. These eight taxas are potential indicators to response towards the environmental changes.

1.2.11 Prof. Nazip gave his opinion that this protocol also can be applied outside of CFS area and can be a good reference for the students in biodiversity research. He hopes that the content of the protocol is aligned with the latest CFS document. FRIM need to highlight the continuous measurement depending on the budget. Reporting can be in various forms; journal, handbook, etc. A session of verification need to be conducted to review of the content to ensure it conforming the specified requirement.

1.2.12 Dr. Lillian acknowledged that the data should be analysed and shared and the protocol can be used outside of CFS area.

1.2.13 The experts are welcomed to comment on the chapters relevant to their expertise.

1.2.14 Prof. Latiff pointed out regarding the soil biota is potential element to be monitored. At RI/universities side, the hands-on on the ground is still fundamental.

1.2.15 Dr. Samsudin expressed his concerns that the protocol need to have an assessment to figure out the end users of the protocol and the way to implement it in the pragmatic manner. Dr. Samsudin also pointed the possibilities of whether only some taxa will be monitored and manner to analyse the data. The protocol also should be able to give the ideas on the level of biodiversity between the two areas. Another matter is how quickly it can be implemented by the agencies without the help of the experts. In comparison to Perak Tools, the taxa and methods were selected to monitor the changes. The basic concerns are who is going to apply it, practicality, the cost and ability to sustain in a long-term monitoring. The state prioritize implementation in a cost-effective and short-term manner.

1.3 Session 2 : Implementation Mechanism

1.3.1 Dr. Lillian stated that the trend happening on the ground in temporal scale in the three Primary Linkages need to be shown. The data collected each session will be analysed, reported and communicated in two forms; articles and report to the decision makers. The abundance data will be collected over a period of times and the trend will be observed. The possible impact from the trend also will be observed. Assistance will be provided to state to figure out the prioritization of the taxa to be monitored.

1.3.2 Mr. Shahfiz inquire Dr Samsudin on how Perak Tools implemented in the state.

1.3.3 Dr. Samsudin responded that Perak Tools does not cover the measurement over time, but focus on one-time inventory. It's not meant for observing trends, where the permanent sample plot is required.

1.3.4 Dr. Lillian highlighted that the protocol is suitable for permanent plot sampling over time. It is going to be translated to project-to-project basis, depending on the capacity of the state and won't be core responsibility of state department.

1.3.5 Prof. Latiff stated there are 3 issues; the demands of decision-makers at federal level (FRIM, FDPM and DWNP); demand of decision-makers at three states; and demand of other stakeholders. There is a need of technical data and also translation of the data for the decision-makers. Understanding on the capacity of implementing agencies should be gained.

1.3.6 Prof. Tajuddin pointed out that rapid rapid assessment on the available data need to be done. The marine ecosystem is not highlighted in the protocol. The report should be produced by highlighting quantitative results on the current condition of the area monitored. The focus on the engagement with community and decision-maker should be enhanced. The expertise availability for capacity building across universities and agencies are sufficient. NGO should collaborate more.

1.3.7 Dr. Lillian acknowledged that this should not be core work of the departments. The student at the universities and personnel across various agencies can involve in the monitoring.

1.3.8 Mr. Rusli informed that at Bahagian Pengurusan Hutan, permanent plot is marked with PVC pole and the data gathered annually to 5 years. The protocol can be applied with advises from technical agencies regarding plot establishment in CFS landscape. He suggested to propose it in the next RMK and include it under project.

1.3.9 Dr. Lillian stated that Primary Linkages need to be prioritized. The plot can be established as GNY or PSP and all research should be conducted in that particular plot. The frequency of monitoring for each taxa can be varied.

1.3.10 Dr. Samsudin stated that the location of the plot and responsible agencies of the plot should be determined.

1.3.11 Prof. Tajuddin suggested that co-management or shared responsibilities concept should be applied. The stations at universities can be utilized and this document should be shared.

1.3.12 Dr. Samsudin suggested that the shared responsibilities need to be clear.

1.3.13 Dr. Lillian suggested that the roadshows at state has to be done. Assuming the approach shared by Mr. Rusli is executable, the forester and ranger at each district/state can be trained. The resource/personnel for capacity building is available and should not be an issue. The state need to be clear that this is not their sole responsibility, but a shared responsibility between government agencies and research agencies.

1.3.14 Mr. Shahfiz informed that National Project Director inquire on how this protocol can be accredited/recognized.

1.3.15 Prof. Latiff informed that the method published in this document can be known regionally, locally and nationally. The area of the plot should be determined based on the capacity and resources. Focus on the area of the plot that can be representative. The advisor should be available during mainstreaming this protocol. The states should buy-in this idea.

1.3.16 Mr. Rusli suggested that the protocol can help state to monitor the changes in the plot.

1.3.17 For the equipment required, it should be co-managed as well.

1.3.18 Regarding the human resources, the prioritization of the taxa should be conducted. It can be conducted by using Google Forms.

1.3.19 Dr. Lillian stated that the prioritization of the taxa still need to be done considering the limited resources of the state. This is crucial to determine the size of the plot.

1.3.20 Prof. Latiff stated that 1-ha plot should be sufficient for monitoring tree, herbaceous plant, herpetofauna, small mammal, big mammal and ant.

1.3.21 Prof. Norhayati agreed that the plot for tree need to be 1-ha plot or more. For vertebrates, bird diversity need expert on site for identification purpose. The sampling on reptile would be hard as it has various trapping methods. Monitoring on big mammals and frog will be sufficient. As the bat take half of the diversity, the sampling on bats through audio method is recommended to be done. The sampling on insect will require huge effort even through passive sampling. There is also an issue about storing the specimen. It is recommended to train rangers up to family level.

1.3.22 Dr. Lillian suggested to distribute Google Forms to expert to prioritize the taxa. If it's going to be project based, it is very important that the primary objective based on this protocol and several taxons that project would like to look at. The additional taxons will be supplementary objective

1.3.23 Mr. Shahfiz clarified that there are six pairs of 0.04 ha-plot and random replicates at each corridor. The monitoring on 19 corridors will include two forest reserves each.

1.3.24 Prof. Norhayati agreed that the bird not included in the primary objective, as human resource is a challenge. It is not ideal for monitoring.

1.3.25 .Dr. Lillian stated that it is not encouraged to teach up to family level for insects, as monitoring need to focus on abundance data, thus requiring up to species level and the number of individuals. Family level works well for diversity, but not on population changes.

1.3.26 Dr. Salmah recommended to include ants and dung beetle, as thousands of individuals can be obtained. However, the limitation is to identify up to species level. The frequency of sampling on insects need to be high, and need to specify who will conduct the sampling. The protocol did not highlight on frequency of sampling on insects.

1.3.27 Dr. Lillian requested meeting members to provide comments and will be harmonized by the project proponent.

1.3.28 Prof. Nazip agreed that the identification need to go up to species level for accurate reporting.

1.3.29 Prof. Latiff stated that the identification of dung beetles can go up to morpho species only due to lack of expertise on dung beetles and ants.

1.3.30 Mr. Rusli stated that the ranger only familiar about trees, thus the co-management need to happen through project.

1.3.31 Prof. Latiff both brain and muscles need to be presence at field and this would be great opportunity to gather the expert. Research assistant at universities can involve in sampling process.

1.3.32 Dr. Lillian stated there are no overlapping job scopes among involved agencies (FDPM, DWNP and FRIM) but need more integration.

1.3.33 The state does not have to bear the cost alone. The benefit/income to the state can be highlighted.

1.3.34 Prof. Latiff commented that if biodiversity and ecosystem services are taken care of indirect income can be generated (e.g. carbon trading). Water can be a good supply for the income. Secondary Linkage also recommended can be afforested, the sustainability of forest can be guaranteed.

1.3.35 Dr. Lillian stated that there is a need of research on the cost-effectiveness of CFS.

1.3.36 For the allocation for salary, field and laboratory equipment, it should be covered under project-based and in-kind.

1.3.37 There is a need to conduct test-based research on financial implications to the state if they decide to adopt the protocol. Mr. Shahfiz informed that TESSA can be ventured for this matter.

1.3.38 Mr. Rusli commented that the protocol can assist the state for long-term monitoring to monitor the effect of mining on the forest and other sites.

1.3.39 Dr. Lillian informed that it is hard to predict the reaction of the population towards the development activities, but there are no other ways for REE, as it has to be rehabilitate.

1.3.40 For the minimum replicate of data for taxa, year and site, the specific criteria will be determined in the project proposal.

	<p>1.3.41 The relevance of gathered data if the planned sampling missed should be discussed in the project proposal.</p> <p>1.3.42 For the data ownership and data storage, the project should utilise One Stop Centre (OSC).</p> <p>1.3.43 Data publication need to be discussed and determined by the project stakeholder. As mentioned, it should be published in two forms; technical and semi-technical. Also can publish for CEPA purposes for managers and teaching purposes.</p> <p>1.3.44 IPTA should involve to have some sort of legal instrument.</p> <p>1.3.45 Dr. Lillian suggested that HQ need to devise some form of agreement for future plan. For immediate plan, this idea need to be sold to HQ and state.</p> <p>1.3.46 The report from this discussion need to be submitted to HQ.</p> <p>1.3.47 Prof. Tajuddin suggested that this protocol can be brought to National Biodiversity Council. It is suggested that the tentative budget to be provided so that the government will include it in the annually budget for 5 years (2023 - 2028). The targets need to be set in short, middle and long-term. Benchmarking need to be determined and everything must be quantifiable. Also can do the Total Economic Value (TEV) and a plan to give back to state.</p> <p>1.3.48 Prof. Latiff suggested to engage National Biodiversity Roundtable and Yayasan Hasanah. Prof Tajuddin suggested to approach MIGHT and Khazanah for funding.</p> <p>1.3.49 Mr. Shahfiz stressed that this discussion is based on technical bodies point of views. The further process will go through decision-makers and managers and their comments should be collected.</p> <p>1.3.50 Prof Latiff suggested to observe Coral Triangle Model and Heart of Borneo model, then focus on project-based.</p>
<p>1.4 Closing Remarks</p>	
	<p>1.4.1 Dr. Lillian appreciated the input provided by the experts in this discussion. Further process would be collecting comments from experts. The meeting is adjourned.</p>

Prepared by,

MUHAMMAD SYARIDZWAN BAHARUDIN

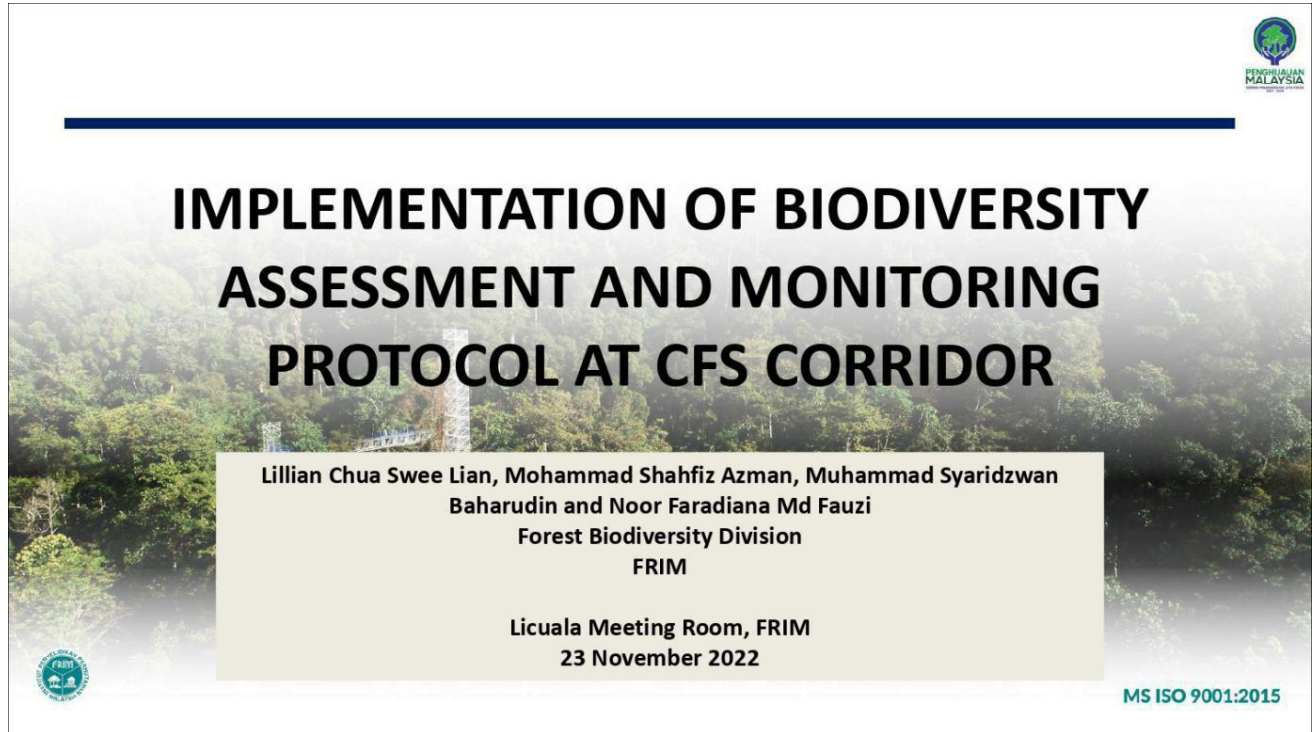
Research Officer
 Zoology Branch
 Forest Biodiversity Division
 Forest Research Institute Malaysia



Reviewed by,

MOHAMMAD SHAHFIZ AZMAN

Head
 Zoology Branch
 Forest Biodiversity Division
 Forest Research Institute Malaysia

SLIDES OF THE PRESENTATION DURING MEETING WITH BIODIVERSITY EXPERTS ON 23 NOVEMBER 2022







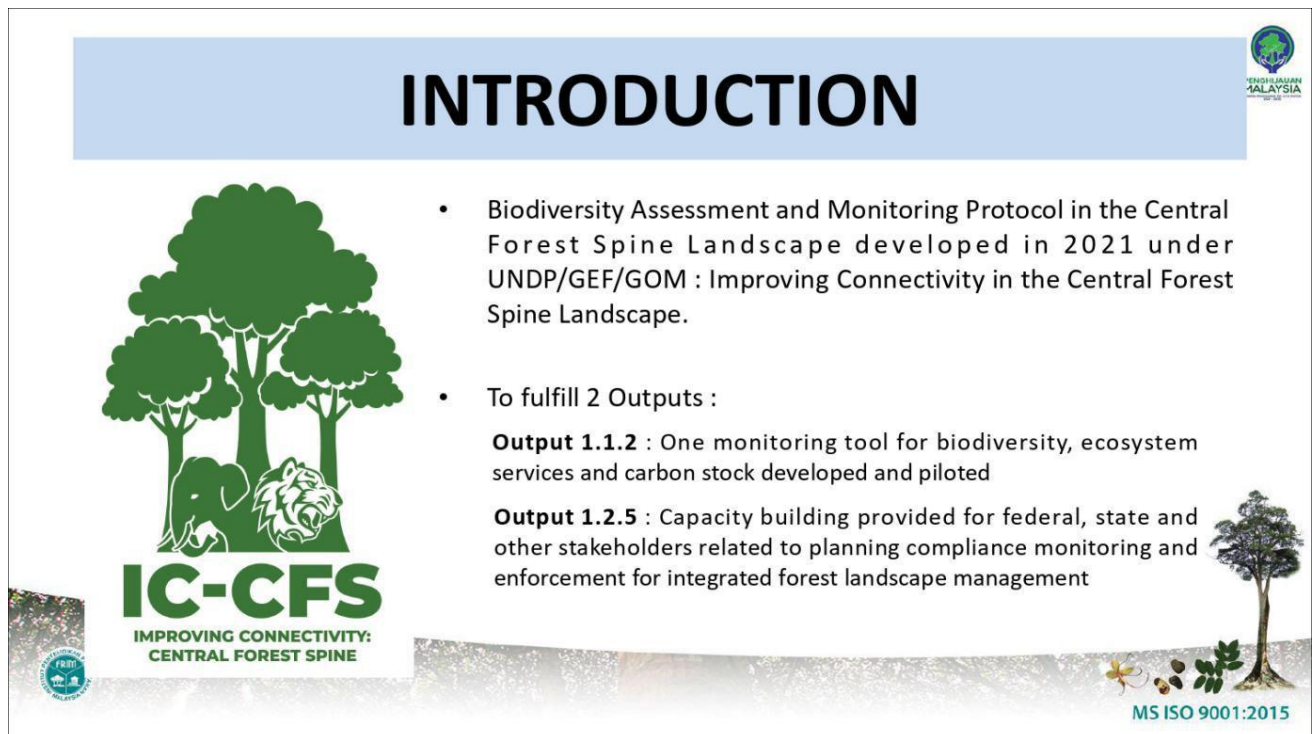
IMPLEMENTATION OF BIODIVERSITY ASSESSMENT AND MONITORING PROTOCOL AT CFS CORRIDOR

Lillian Chua Swee Lian, Mohammad Shahfiz Azman, Muhammad Syaridzwan Baharudin and Noor Faradiana Md Fauzi
Forest Biodiversity Division
FRIM


Licuala Meeting Room, FRIM
23 November 2022






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INTRODUCTION



- Biodiversity Assessment and Monitoring Protocol in the Central Forest Spine Landscape developed in 2021 under UNDP/GEF/GOM : Improving Connectivity in the Central Forest Spine Landscape.
- To fulfill 2 Outputs :
 - Output 1.1.2** : One monitoring tool for biodiversity, ecosystem services and carbon stock developed and piloted
 - Output 1.2.5** : Capacity building provided for federal, state and other stakeholders related to planning compliance monitoring and enforcement for integrated forest landscape management



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INTRODUCTION

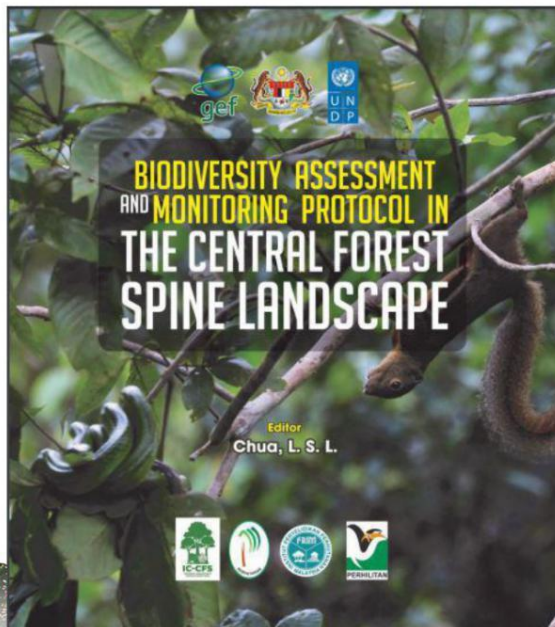


- Comprise of 8 taxa :
 - 1) Big Mammal - PERHILITAN
 - 2) Small Mammal - FRIM
 - 3) Herpetofauna - FRIM
 - 4) Butterfly - FRIM
 - 5) Dung Beetle - FRIM
 - 6) Ant - FRIM
 - 7) Herbaceous Plant - FRIM
 - 8) Tree - FRIM



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OBJECTIVE



1. To be a reference for documenting the monitoring the biodiversity in CFS landscape.
2. To provide a consistent and standardized method for biodiversity data collection
3. To identify changes in population and communities in the CFS landscape;
4. To build the capacity of agencies' personnel that involve in CFS management.



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METHODOLOGY - ANT



Target Population

- Ground foraging
- Soil inhabitant
- Arboreal ant

Collection methods



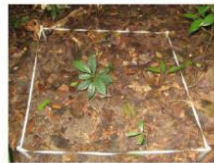
Leaf litter sifting (Si)



Arboreal pitfall trap (Ar)



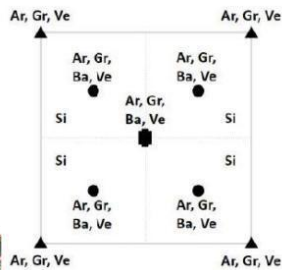
Baiting (Ba)



Vegetation survey (Ve)



Ground pitfall trap (Gr)



9 stations established at 0.04-ha plot.

Specimen handling



Specimen preserved in 95% ethanol



Specimen stored in airtight insect box

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METHODOLOGY - BUTTERFLY



Target Population

- Papilionidae
- Pieridae
- Nymphalidae
- Riodinidae
- Lycaenidae
- Hesperidae

Collection methods



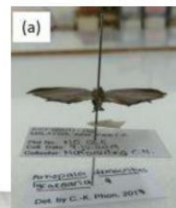
Active search



Environmental data collected are air temperature, relative humidity, light intensity and canopy openness



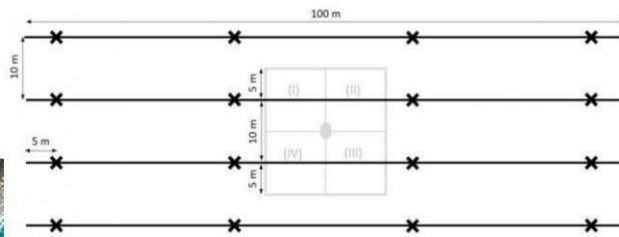
Specimen handling



Pinning specimen with needle



Specimen stored in airtight insect box



The transects established measured 100 m each and placed 10 m apart. The cross represent environmental factor station

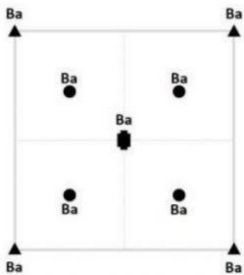
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METHODOLOGY - DUNG BEETLE



Target Population

- Dung beetles attracted to elephant dung/any herbivore dung.



9 stations established at 0.04-ha plot

Collection methods



Baited pitfall trap (Ba)



Ground vegetation survey

Specimen handling



Pinning specimen with needle



Specimen storage



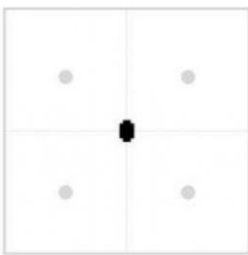
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METHODOLOGY - LARGE MAMMAL



Target Population

- The extant 15 species of large mammal in Peninsular Malaysia



A camera trap is set up at the center of the 0.04-ha plot

Collection methods



Camera trap set approximately 35-40 cm from ground surface using Phyton cable



Image analysis were done by checking presence of wildlife in each image



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METHODOLOGY - SMALL MAMMAL

Target Population

- Non-volant small mammal weighing below 5 kg at adult stage

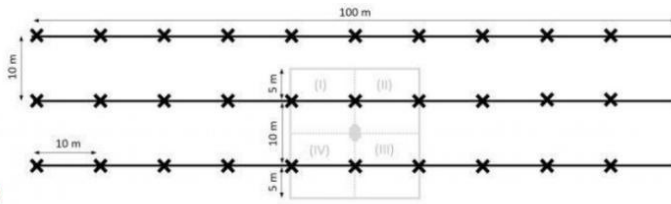
Collection methods



Live-trapping method using cage trap

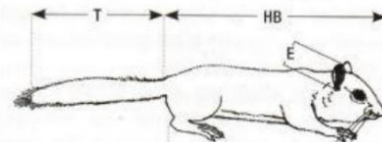


Measuring the length (a) and diameter (b) of the fallen log for coarse woody debris data



Four 100 m transect established and placed at 10 m apart. A cross represent a trap.

Specimen handling



Measurement of the small mammal species; head-body length (HB), tail length (T), hind foot length (HF) and ear (E)



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METHODOLOGY - HERPETOFAUNA

Target Population

- All types of reptiles and amphibians

Collection methods



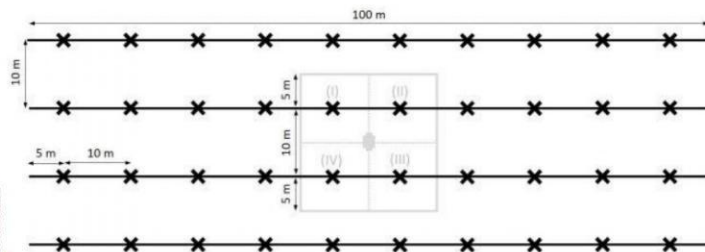
Pitfall trapping



Active search



Microhabitat survey



Four 100 m transects established and placed at 10 m apart. The cross represents a pitfall trap.

Specimen handling

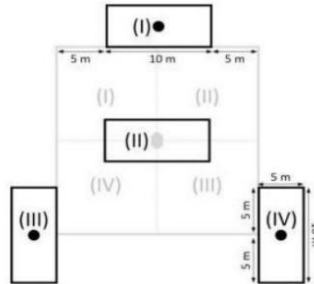


Measuring the length of specimen; snout-vent length (SVL) and total length (TL)

METHODOLOGY - HERBACEOUS PLANT

Target Population

- Grasses
- Sedges
- Ferns
- Herbaceous plant
- Small woody herbs
- Non-climbing palms
- Gingers
- Invasive herbaceous plant



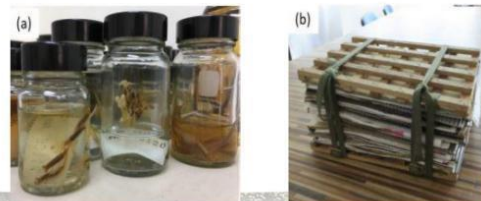
Four 5 x 10 m subplots for sampling herbaceous plant in 0.04-ha plot.

Collection methods



Ocular estimation and photogrammetry process on 5 x 10 m quadrat

Specimen handling



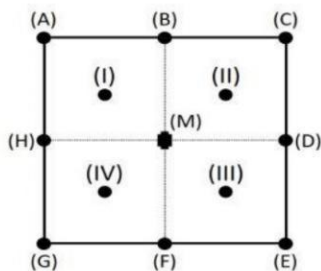
a) Preserving soft specimen in Copenhagen solution and b) compressing specimens between two wooden presses



METHODOLOGY - TREE

Target Population

- Tree and 13 shrub species.



A 20 x 20 m (0.04-ha) plot centered at a sampling location and divided into 4 subplots (I-IV).

Collection methods



(a) Locating height of measurement and (b) marking level of dbh

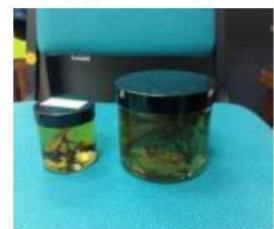


Collecting leaves by using pole-cutter (a) and catapult (b)

Specimen handling



Specimen labelled before processed



Soft specimen preserved in Copenhagen solution



Specimen pressed between two wooden presses



Specimen stored in herbarium form

INFORMATION THAT WILL BE GENERATED

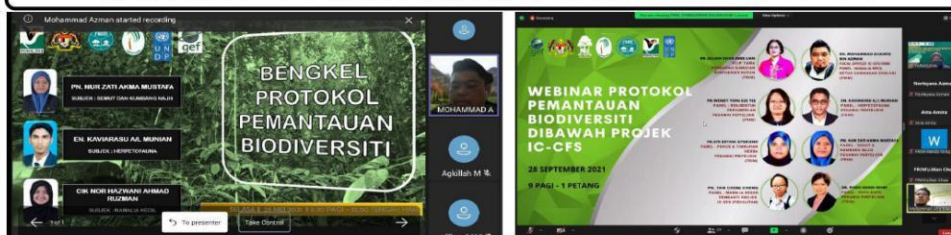


- The checklist of biodiversity for the CFS ecological corridor
- The distribution and movement pattern of species; dynamic population for selected species
- Supplementary information for the development and implementation of appropriate mitigations measures for the corridors.
- Act as basis for the consideration towards certain development activities in the CFS landscape
- To be utilized in formulating the suitable and effective action plan for equal consideration on development necessities and biodiversity rehabilitation.



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WORKSHOP ON BIODIVERSITY MONITORING PROTOCOL



THANK YOU



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PHOTOS TAKEN DURING MEETING WITH BIODIVERSITY EXPERT ON 23 NOVEMBER 2022



SESSION 2: IMPLEMENTATION MECHANISM
11.10 AM – 12.10PM

► **Human Resources**

1. Capacity of the States to implement the protocol? What is the requirement for capacity building?
2. Which Unit at State Department should undertake monitoring and gather the data? Is there potential of developing one special unit to monitor biodiversity at the state? If yes, what is the minimum number of personnel in the unit?
3. Does the state having appropriate equipment and other facilities (field and lab) to carry out inventory?
4. Should taxa be prioritised for monitoring? If yes, which taxa?
5. How about the availability and sustainability of the experts?
6. Who will provide the training?
7. Does there are overlapping on the job scopes among agencies? i.e Forestry and DWNP



REVIEW ON

BIODIVERSITY MONITORING PROTOCOL

This review aimed to elaborate on the discussion held with biodiversity experts concerning the potential implementation of the “Biodiversity Assessment and Monitoring Protocol in the Central Forest Spine Landscape” published in 2021 under UNDP/GEF/GoM : Improving Connectivity in the Central Forest Spine Landscape project. The elaboration was divided into 2 sections : Technical Review (Section 1) and Means and Mechanisms of Implementation (Session 2). Session 1 delve more into the strengths and areas for improvement for the Protocol, while Session 2 focused on the implementation challenges. This publication is intended to serve as a reference for researchers looking to integrate their research findings into the government agencies acting as decision-makers.

