



Malaysian National Interpretation
for the **Identification** of
High Conservation Values

HCV



This document is the Malaysian National Interpretation of the Common Guidance on the Identification of High Conservation Values (HCVs) which was originally produced by the HCV Resource Network (HCV RN). It supersedes the High Conservation Value Forest (HCVF) Toolkit for Malaysia published by WWF-Malaysia in 2009.

The production of this National Interpretation document was spearheaded by the HCV Malaysia Toolkit Steering Committee with inputs from the Technical Working Group and technical guidance from the HCV Resource Network.

The HCV Malaysia Toolkit Steering Committee comprises FSC Malaysia, the Malaysian Palm Oil Association (MPOA), the Malaysian Palm Oil Certification Council (MPOCC), the Malaysian Timber Certification Council (MTCC), the Roundtable for Sustainable Palm Oil (RSPO), the Roundtable for Sustainable Biomaterials (RSB) and WWF-Malaysia.

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The Technical Working Group (TWG) of the HCV Malaysia Toolkit Steering Committee comprises the following organisations: Centre for Malaysian Indigenous Studies, Dayak Oil Palm Planters Association (DOPPA), Department of Agriculture Sarawak, Felda Global Ventures (FGV), Forestry Department Peninsular Malaysia, Forest Research Institute Malaysia (FRIM), Forest Solution Malaysia, Forever Sabah, Global Environmental Centre (GEC), Bunge Loders Croklaan, Kelantan State Forestry Department, Kiwiheng Sdn. Bhd., Kompleks Perkayuan Kayu Kayan Terengganu, Malaysian Nature Society, Malaysian Palm Oil Certification Council (MPOCC), NEPcon, PEERS Consult, Persatuan Dayak Sarawak (PEDAS), Sabah Forest Industries, Sarawak Forestry Corporation, Sime Darby, Sarawak Oil Palm Plantation Owners Association (SOPPOA), TSH Resources, Universiti Malaya, Universiti Malaysia Sarawak, Wilmar International, WWF-Malaysia.

As the development of this toolkit involved a multi-stakeholder consultation process, the outputs are not meant to belong to any individual party and should be freely available to all practitioners of the HCV approach.

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List of Acronyms and Abbreviations

ALS	Assessor Licensing Scheme of the HCVRN
AZE	Alliance for Zero Extinction
BRIMAS	Borneo Resources Institute
CCA	Community Compartment Area (in the case of SFMLA in Sabah)
CCB	Climate, Community & Biodiversity
CFS	Central Forest Spine (Peninsular Malaysia)
CG	Common Guidance on the Identification of HCVs (HCVRN)
CITES	Convention on the International Trade in Endangered Species of Wild Fauna & Flora
COAC	Centre for Orang Asli Concerns
CR	Critically Endangered (IUCN)
DD	Data Deficient (IUCN)
DID	Department of Irrigation and Drainage
DOSM	Department of Statistics Malaysia
DTCP	Department of Town and Country Planning
DWNP	Department of Wildlife and National Parks (Peninsular Malaysia)/Jabatan Perlindungan Hidupan Liar dan Taman Negara (PERHILITAN)
EN	Endangered (IUCN)
ERA	Environmental Risk Assessment
ESA	Environmentally Sensitive Area
FMU	Forest Management Unit
FPIC	Free, Prior and Informed Consent
FSC	Forest Stewardship Council
FRIM	Forest Research Institute Malaysia
GFS	Gravity-fed system
GIS	Geographical Information System
HCV	High Conservation Value
HCVA	High Conservation Value Area
HCVMA	High Conservation Value Management Area
HCVNI	High Conservation Value National Interpretation
HCVRN	High Conservation Value Resource Network
HOB	Heart of Borneo
IBA	Important Bird and Biodiversity Area
IPA	Important Plant Area
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for the Conservation of Nature
JOAS	Jaringan Orang Asal Se-Malaysia (Indigenous Peoples Network of Malaysia)
JUEM	Jabatan Ukur dan Pemetaan (Department of Survey and Mapping)
KBA	Key Biodiversity Area
KDCA	Kadazan Dusun Cultural Association
LAC	Limits of Acceptable Change
MC&I	Malaysian Criteria and Indicators (of the Malaysian Timber Certification Scheme)
MPOA	Malaysian Palm Oil Association
MPOCC	Malaysian Palm Oil Certification Council
MTCC	Malaysian Timber Certification Council
MTCS	Malaysian Timber Certification Scheme
MU	Management unit
MyBIS	Malaysia Biodiversity Information System

NCZPP	National Coastal Zone Physical Plan
NECAP	National Elephant Conservation Action Plan
NI	National Interpretation
NPBD	National Policy on Biological Diversity
NRE	Ministry of Natural Resources & Environment
NSPSF	North Selangor Peat Swamp Forest
NT	Near Threatened (IUCN)
NTCAP	National Tiger Conservation Action Plan
NTFP	Non-timber forest product; non-timber forest produce (in the case of Sabah)
P&C	Principles & Criteria
REDD	Reduction of emission from deforestation and forest degradation
RIL	Reduced impact logging
RSB	Roundtable on Sustainable Biomaterials
RSPO	Roundtable on Sustainable Palm Oil
RTE	Rare, threatened and endangered
SADIA	Sarawak Dayak Iban Association
SFMLA	Sustainable Forest Management License Agreement
SC	HCV Malaysia Toolkit Steering Committee
TEK	Traditional Ecological Knowledge
TPA	Totally Protected Area (in the case of Sabah and Sarawak)
VCS	Verified Carbon Standards
VU	Vulnerable (IUCN)

Glossary

Biological diversity/ Biodiversity	The variety of life on earth including all plants, animals, micro-organisms, the ecosystems to which they belong, and the diversity within species, between species, and of ecosystems. Biodiversity also refers to the complex relationships among living things, and between living things and their environment.
Ecological type	See definition for ecosystem below.
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. In the context of this document, ecosystem is used interchangeably with “ecological type” to describe a geographic area which has plant and animal communities within a defined and thus mappable, geophysical area. This can contain many habitats for many different entities, e.g. lowland forest.
Ecosystem services	Benefits people obtain from ecosystems, including provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; cultural services such as recreational, spiritual, religious and other nonmaterial benefits; and supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other nonmaterial benefits.
Free Prior Informed Consent (FPIC)	A specific right that pertains to indigenous peoples and is recognised in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). It allows them to give or withhold consent to a project that may affect them or their territories. Once they have given their consent, they can withdraw it at any stage.
Habitat	An ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. The term typically refers to the zone in which the organism lives and where it can find food, shelter, protection and mates for reproduction. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population. In the context of this document, habitat is used to describe the range and conditions where a particular species or type of plant or animal are limited to. Habitats can range across many different ecosystems, e.g. habitat of an elephant.
Hyper-endemic	A plant or animal species whose distribution is highly restricted to a certain place.
Niche	An occupation, what a microbe, fungi, plant or animal does in an ecological community.
Orang Asal	A collective term used for indigenous peoples in Malaysia.
Refugia	Areas in which a population of organisms can survive through a period of unfavourable conditions (singular = refugium).

Species	The scientific definition according to the Biological Species Concept is: Groups of actually or potentially interbreeding natural populations, which are reproductively isolated from other such groups. However, there are many partial exceptions to this rule in particular taxa. Operationally, the term species is a generally agreed fundamental taxonomic unit, based on morphological or genetic similarity, that once described and accepted is associated with a unique scientific name. (Source: Millennium Ecosystem Assessment: Ecosystems and Human Wellbeing, Volume 1, Current State and Trends).
Species diversity	Biodiversity at the species level, often combining aspects of species richness, their relative abundance, and their dissimilarity.
Ultrabasic	Igneous rocks having a silica content less than 45 per cent by weight.
Ultramafic	Ultramafic rocks/soils are generally deficient in the essential macronutrients, i.e. phosphorus and potassium, high magnesium/calcium ratios and high concentrations of potentially phytotoxic nickel.
Wetlands	Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.

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Background to this document



Measuring the depth of organic soil at a peat swamp forest

Credit: Proforest/Mike Senior

The High Conservation Value (HCV) approach was first developed in 1997 and incorporated in the Principles & Criteria (P&Cs) of the Forest Stewardship Council (FSC) in 1998 for identifying and managing environmental and social values in forest landscapes. A three-part High Conservation Value Toolkit (the 'Global Toolkit') was produced in 2003 by Proforest.

The HCV Resource Network (HCVRN) was established in 2005 and in the subsequent years the HCVRN and FSC worked together to revise the HCV definitions. In order to promote a **common interpretation of the HCV definitions** and thus a more consistent application across different natural resource sectors or geographies, the global HCV definitions were amended as part of the revision of the FSC P&C (2012).

In the intervening years, the HCV approach had evolved with greater emphasis given to values rather than areas, and its scope expanded beyond forests ecosystems. At the global level, HCV is now widely used in certification standards (forestry and agriculture systems) and more generally for resource use and conservation planning.

Although Malaysian national policies do not describe conservation values along the lines of the HCV approach, it should be noted that the HCV approach is not an externally imposed concept. Over the years, there has been a progressive recognition of values that need to be conserved for the benefit of the country and its people. The importance of protecting forests and wildlife for various reasons has been recognised as far back as the early 1900s as evidenced by laws on forest and wildlife protection. The protected areas that have been established and the lists of protected species included in the wildlife legislations of Peninsular Malaysia, Sabah and Sarawak are examples of the country's recognition of HCV 1. Awareness about impacts from agriculture and other development activities on ecosystem services (HCV 4) lead to the formulation of environmental laws in the 1970s and subsequent national policy documents such as the National Physical Plan. Malaysia's ratification of the Convention on Biological Diversity and the adoption of the National Policy on Biological Diversity in the 1990s are a manifestation of concern over the protection of HCVs 1-3.

Since 2012, there has been a consultative process to develop a new set of practical user manuals for HCV practitioners. The first document produced under this initiative is the Common Guidance for the Identification of HCVs produced in 2013 to clarify the use of HCV to other ecosystems and to provide guidance on the updated HCV definitions, as well as examples from practical field experience. This was followed by the Common Guidance for the Management and Monitoring of HCVs in 2014.

In Malaysia, a guidance document called "High Conservation Value Forest (HCVF) Toolkit for Malaysia: A national guide for identifying, managing and monitoring High Conservation Value Forests" was published in 2009 based on the Global Toolkit in an initiative led by WWF-Malaysia. As its name suggests, the toolkit was mainly aimed for use by the forestry sector and for forest ecosystems. Since then, there has been an increased demand for the application of the HCV

approach within the palm oil certification context. Significant developments have also happened at the national level with regard to laws and policies related to natural resources management e.g. the formulation of the National Physical Plan and the Central Forest Spine Master Plan in Peninsular Malaysia; the replacement of the Protection of Wild Life Act 1972 with the Wildlife Conservation Act 2010 in Peninsular Malaysia; progress in the implementation of the Heart of Borneo initiative in Sabah and Sarawak; and more recently the launch of the National Policy on Biological Diversity 2016-2025 and the Sabah Structure Plan 2016-2033.

As such, there was an urgent need to develop a new Malaysian HCV toolkit which is applicable to various terrestrial ecosystems (including non-forested ecosystems) in Malaysia, and which is aligned to the HCVRN Common Guidance documents.

A Steering Committee (SC) for the HCV Malaysia Toolkit development was formed in April 2015 comprising the Forest Stewardship Council (FSC) Malaysia, Malaysian Timber Certification Council (MTCC), Roundtable on Sustainable Palm Oil (RSPO), Roundtable on Sustainable Biomaterials (RSB), WWF-Malaysia, and the Malaysian Palm Oil Association (MPOA). The SC consists of custodians of certification schemes active in Malaysia at that time (i.e. FSC Malaysia, MTCC, RSPO, RSB), as well as key initiators of the HCV Malaysia Toolkit process (WWF-Malaysia and MPOA). The Malaysian Palm Oil Certification Council (MPOCC), which was established in 2016, joined the SC soon after.



Borneo pygmy elephant
Credit: Mike Senior

The SC then formed the Technical Working Group (TWG) which is a group of subject matter specialists and relevant stakeholders to provide advice and technical inputs for the development of the HCV Malaysia toolkit. The TWG is structured in accordance with the three geographical regions in Malaysia namely Sabah, Sarawak and Peninsular Malaysia as these three regions vary substantially in legal frameworks, pace of economic development and environmental conditions. In each geographic region efforts were made towards ensuring adequate representation from the different key stakeholder groups. In addition to inputs from the TWG, public consultations were held between October and December 2017 to obtain views from a wider set of stakeholders in Malaysia, during which time regional and national stakeholder consultation workshops were also held. Annex 8 provides a list of the stakeholder consultation workshops and the organisations that participated in the workshops.

How to use this document

This National Interpretation (NI) document should be used together with the Common Guidance (CG) for Identification of HCVs and not as a stand-alone document. Where there is a lack of guidance on any particular item, please refer to the relevant section(s) in the Common Guidance. Where there is a conflict or discrepancy, the global HCV guidance and definitions take precedence over national interpretations. However, where the NI goes beyond the CG, it is NOT a conflict or discrepancy, including instances where the NI requirements may be more stringent than those of the CG.

This NI document is intended primarily for HCV assessors, resource managers, and auditors. It is to be used in conjunction with the HCVRN’s Common Guidance for the Identification of High Conservation Values which provides guidance on the interpretation of the HCV definitions and their identification in practice, to achieve standardisation in use of the HCV approach.

As in the case of the CG, it is not a binding document, but rather a guide to “best practice”. This NI should be followed in a consistent manner, particularly where certain approaches are to be used in providing justifications for the HCV findings. Further details on requirements relating to HCVs should be sought from the relevant certification scheme.

The introduction sections of this document provide the context for how the HCV approach should be used, including advice on HCV assessments. The main sections provide detailed guidance on national interpretation of the six HCV categories, particularly the interpretation of key terms and concepts related to each value; potential data sources and indicators for HCVs; and illustrative case studies and examples for each HCV category.

This guidance is mainly aimed at **larger commodity producers** who are targeting to achieve and or maintain certification status for a range of commodities (including timber and palm oil). While it is well-acknowledged that a significant proportion of agricultural commodities is produced by smallholders, they do not have access to the same level of technical expertise and financial resources as large companies. Therefore, some of the guidance in this document will be beyond the reach of many small producers. The HCVRN is currently producing additional guidance documents for smallholders and the national interpretations for these documents may be produced in future.

This document focuses on identification of HCVs, and therefore the management and monitoring of HCVs are only briefly touched upon in this document. The next phase in the development of the HCV Malaysia Toolkit will result in one or more national interpretations of the HCVRN Common Guidance for the Management and Monitoring of HCVs.



An oilpalm plantation in Peninsular Malaysia
Credit: Surin Suksuwan



An agarwood plantation in Peninsular Malaysia
Credit: Surin Suksuwan

1. Introduction

HCV national interpretations (HCVNIs) are documents that adapt the general definitions of the six HCV categories to a country context. HCVNIs are important for two reasons:

1. Generic values include terms like significant, critical and concentration, which need to be qualified and quantified according to the local context
2. Appropriate management of an HCV depends on the level of threat to the value, which can vary dramatically between countries.

This document is the Malaysian national interpretation of the HCV Common Guidance for the Identification of High Conservation Values.

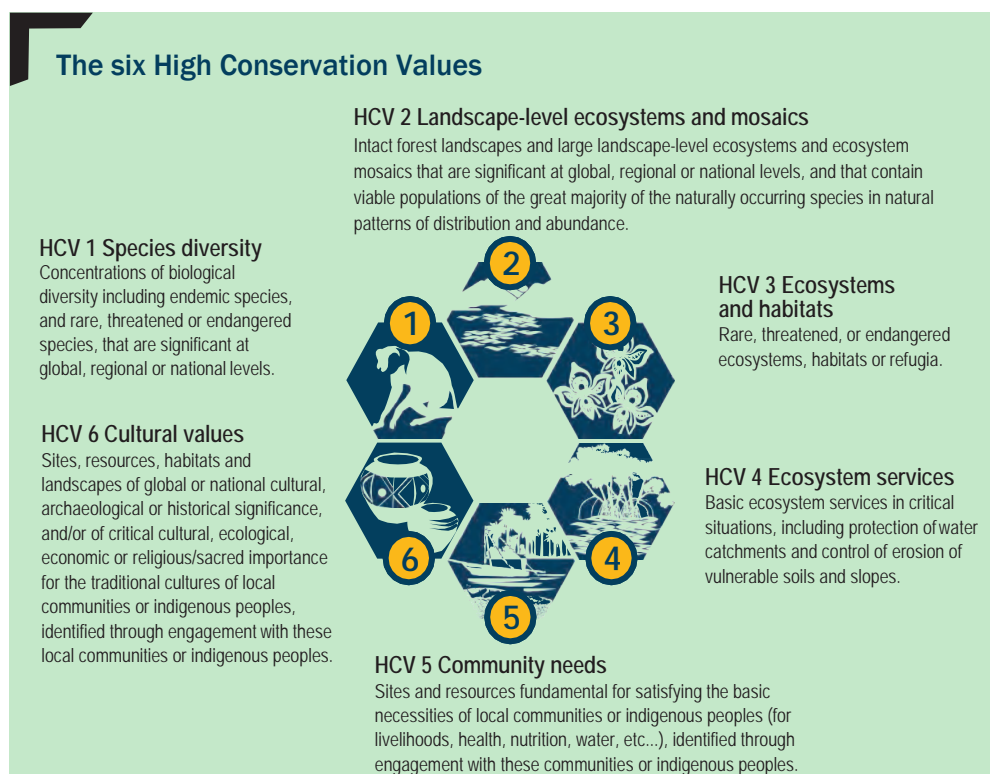
The HCV Malaysia Toolkit is envisaged to comprise at least two documents: (i) a national interpretation of a HCVRN Common Guidance for HCV Identification; and (ii) a national interpretation of the Common Guidance for the Management and Monitoring of HCVs.

The national interpretation on HCV Identification is not meant to be commodity- or sector-specific, as the HCV definitions are universal. However, the proposed national interpretation on management and monitoring of HCVs will be targeted at specific commodities or sectors given that the management and monitoring measures needed to maintain and/or enhance HCVs would vary from one commodity to another. As such, it is expected that there will be one national interpretation document for the management and monitoring of HCVs related to the palm oil sector, another national interpretation for the management and monitoring of HCVs related to the forestry sector and so on.

This document is the first component of the HCV Malaysia Toolkit, i.e. the national interpretation for the identification of HCVs. This NI is mainly applicable to the terrestrial biome and not the marine biome.

1.1 The six High Conservation Values

An HCV is a biological, ecological, social or cultural value of outstanding significance or critical importance. The six categories of HCVs, as defined through consultative processes led by the FSC and HCVRN, are:



Source: Brown *et al.* (2013) and HCVRN

The HCVs are elaborated further in the Common Guidance for the Identification of HCVs and the national interpretation of key terms and concepts related to the different values can be found further below in this document.

1.2 The High Conservation Value Approach

The three key steps in implementing the HCV approach are:

- **Identify** the HCVs through assessments and stakeholder consultation
- **Manage** the HCVs by implementing appropriate measures and
- **Monitor** the implementation and effectiveness of these management measures.

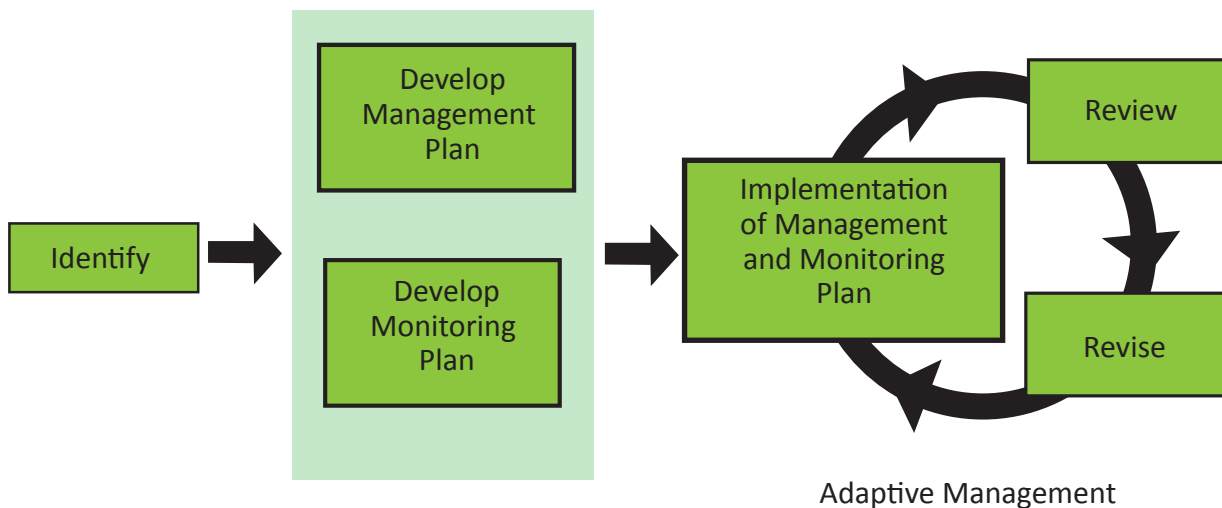


Fig.1: A brief schematic outline of the HCV approach

1.2.1 Identification

Identification involves interpreting what the six HCV definitions mean in the local or national context and assessing which HCVs are present in the area of interest or management unit¹. It also involves assessing which HCVs in the wider landscape may be negatively impacted by project activities (e.g. impacts on water or wetland HCVs may occur well beyond the management unit).

Identification of HCVs is done through an HCV assessment which consists of information exchange and gathering, stakeholder consultation, scoping study and environmental and social fieldwork. HCV assessments should result in a clear report on the presence or absence of values, their location, status and condition, and as far as possible should provide information on areas of habitat, key resources, and critical areas that support the values. This will be used to develop management recommendations to ensure that HCVs are maintained and/or enhanced.

¹The area of interest or development area (whether proposed or existing) may also be referred to as management unit, plantation, concession, etc. For simplicity, “management unit” or MU will be used throughout this document.

1.2.2 Management

An area where one or more HCVs are present is a HCV Area or HCVA while an area within the management unit or in the wider landscape for which appropriate management decisions must be taken and implemented in order to maintain or enhance an HCV is called a HCV Management Area or HCVMA.

The HCVA is usually designated as a conservation area within the management unit, while within the HCVMA production activities may occur, provided that they do not cause any deterioration of the HCV(s). The size of the HCVMA is usually larger than the HCVA, where appropriate. The identification of the HCVMA should be based on expert opinion and best available science and not just on the opinion of the assessor. See Box 1 for an example illustrating the difference between HCV and HCVMA.



Begonia aequilateralis
Credit: Surin Sukswan

Box 1: HCVA and HCVMA

One example is a population of an RTE plant species found in a particular location. The area where the plants are found is an HCVA. In order to maintain the population, the ecology of the plant species needs to be understood, including its pollination and seed dispersal mechanism and sensitivity to disturbance. Based on the inputs from relevant experts and best science available, the size of the area needed to sustain the population, i.e. the HCVMA, can be estimated. The size of the HCVMA can vary greatly depending on the ecology of the particular species, e.g. a self-pollinating *Begonia* species may be able to persist in a relatively small area that is isolated from other populations, while individuals of a particular tree species maybe scattered over a wide expanse of forested areas and the pollinator may be flying foxes that roost many kilometres away, in which case the HCVMA needs to include the roosting area of the flying foxes as well.

In order to design a management system for HCVs, an assessment of the existing and potential threats to the HCVs should be conducted. These threats include:

- threats from proposed management activities, such as logging operations or plantation establishment
- threats from external activities such as hunting, illegal logging or construction of a new road or dam.

The management requirements needed for maintaining and enhancing HCVs include demarcating areas that need total protection and areas that can be used for production. Within the production areas, activities must be consistent with maintaining or enhancing HCVs (e.g. anti-poaching controls or fire management policies).

1.2.3 Monitoring

A monitoring system should be established to ensure that management practices effectively maintain and/or enhance the HCVs over time. Appropriate indicators must be chosen for the monitoring of the HCV status, and thresholds should be determined for deciding when appropriate actions are required to ensure that the HCVs are maintained or enhanced. Indicators and thresholds for action are likely to be site and/or country-specific.

1.3 Common guidance: using HCV across different ecosystems and land uses

The identification of HCVs as elaborated in this document and the Common Guidance can be applied to different ecosystems, different commodities (with a focus on forestry and agriculture) and across different geographies.

Malaysia is a federation of 13 states of which 11 are located in Peninsular Malaysia while two states, namely Sabah and Sarawak, are located on Borneo island. Due to historical reasons and the Federal Constitution, Sabah and Sarawak have more autonomy over their natural resources compared to the Peninsular Malaysia states. In addition, there are also regional differences in terms of socio-cultural context. Therefore, the applicable national and state laws and policies need to be taken into account when identifying HCVs.

For the purpose of this document, regions refer to the three distinct geographical areas in Malaysia i.e. Peninsular Malaysia, Sabah and Sarawak. Throughout this document, due recognition is given on these regional differences and where relevant it is stated clearly what are the laws, policies, data sources, etc. that are specific to each region.

The Common Guidance for the Identification of HCVs provides explanations of how HCVs are relevant in different ecosystems, how the HCV concept is used in commodity production schemes and how HCV national interpretations are useful for adapting the general definitions to a country context. The following section mirrors this but focuses on information that is relevant to the national context.

1.3.1 HCV in different ecosystems

In contrast to the earlier HCVF Toolkit for Malaysia, this document is applicable for both forested and non-forested natural ecosystems. Non-forested natural ecosystems in Malaysia encompass vegetation on limestone, quartz ridges and at higher elevations on mountains, heath vegetation as well as some wetland types. When conducting an HCV assessment, non-forested areas within the management unit or in the wider landscape should not be overlooked or assumed to be lacking in HCVs. This is because the non-forested natural ecosystems (terrestrial or aquatic) as briefly listed above



Peatswamp forest at Sungai Bebar in the Pekan Forest Reserve, Pahang
Credit: WWF-Malaysia/Ahmad Zafir

may also harbour significant values and the HCV process is used as a safeguard against the destruction of critical values that could occur, directly or indirectly, through forestry operations or conversion of natural vegetation to plantation forestry or agriculture.

Freshwater ecosystems in particular are impacted by changes to water quality, quantity and loss of riparian vegetation (see Box 2 below). Threats to the integrity of freshwater ecosystems include fragmentation due to the building of roads and other infrastructure such as the construction of hydraulic structures (resulting in the blocking of natural waterways), water abstraction and overplanting into river buffer areas. Therefore, if there are freshwater ecosystems present within the management unit or in the wider landscape, there should be an assessment of potential HCVs. It is important that for any freshwater HCV assessment, the geographical scope of analysis (or hydrogeographical scope) should be defined before identifying HCVs or the areas required for their maintenance. This may be best accomplished through a scoping study.

Box 2: Freshwater aquatic ecosystems considerations in HCV national interpretation

Contributed by Casey Ng, www.foreversabah.org

Inland freshwater aquatic ecosystems present a special challenge because they experience cycles of expansion, shrinkage and even change shape as a response to seasonal rainfall intensity. The hydrological characteristics may also be affected by the natural or anthropogenic factors occurring outside the HCVA.

For example, a peat swamp within a management unit (MU) may lose its ecological integrity when an area outside the MU is drained, thereby reducing the depth of underground water table (Mezbahuddin *et al.*, 2014; Carlson *et al.*, 2015). Similarly, although the management activities for riparian buffer zones maybe strictly implemented within an MU, point and non-point pollution, siltation and sedimentation from rivers and waterbodies outside the MU may flow or spill into the aquatic HCVA. In the case of gravity-fed systems that supply basic water needs to the local community (typically assigned as HCV5), any surrounding landscape disturbances may reduce the volumetric flow of water. The release of alien invasive flora or fauna species into a lake or wetland designated as HCV4 may potentially disrupt the ecological balance of native species, and negatively affect local communities relying heavily on inland fishery. Food and habitat competition from introduced species will further push threatened native species into extinction.

For these reasons, assessors must look at the bigger picture when attempting to identify the factors and risks when formulating an effective HCVA management plan. In many cases, freshwater aquatic ecosystems harbouring high conservation values require multidisciplinary interventions that transcend across terrestrial biotope, hydrogeomorphology, water physico-chemistry, species biology and social-economic characteristics.

References

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Introduced semi-aquatic plant *Salvinia molesta* has blanketed some oxbow lakes and other wetlands rapidly in the Kinabatangan floodplain thus reducing dissolved oxygen in the water. This has negatively affected the native fish population and local community that relies on inland fishery for food.

Section 3.3 of this document provides examples and guidance for major ecosystem types in Malaysia both forested and non-forested.





1.3.2 Different land uses: Commodity production

Certification standards

In Malaysia, the HCV concept was first used in forest certification specifically with the introduction of FSC into Malaysia in the mid-to-late 1990s followed by the Malaysian Timber Certification Scheme (MTCS) whose Malaysian Criteria & Indicators (MC&I) 2002 incorporated the concept of HCV Forests. When the RSPO's Principles & Criteria for the Production of Sustainable Palm Oil was first launched in 2005 it also incorporated the HCV approach. Subsequently, other commodity certification standards incorporating the HCV or related concepts were introduced in Malaysia.

Table 1 below provides a summary of the different commodity certification standards operational in Malaysia and their main principles related to the HCV or similar approaches, and other supporting principles which complement HCVs or provide additional safeguards related to environmental and social values.

Table 1: The HCV approach in different sustainability certification standards operational in Malaysia

Certification Standard	Use of "HCV"	Supporting Principles
Forest Stewardship Council (FSC) 	Principle 9 High Conservation Values	Principle 3 Indigenous People's rights Principle 4 Community relations Principle 6 Environmental values and impacts
Malaysian Timber Certification Standard 	Principle 9 Maintenance of High Conservation Value Forest	Principle 3 Indigenous People's Rights Principle 5 Benefits from the forest Principle 6 Environmental impact
Roundtable on Sustainable Palm Oil (RSPO) 	Principle 5 Environmental responsibility and conservation of natural resources and biodiversity Principle 7 Responsible development of new plantings	Principle 1 Commitment to transparency Principle 2 Compliance with applicable laws and regulations Principle 6 Responsible consideration of employees and of individuals and communities affected by growers and mills
Roundtable on Sustainable Biomaterials (RSB) 	Principle 7 Conservation: Operations avoid negative impacts on biodiversity, ecosystems, and conservation values	Principle 5 Rural and social development Principle 6 Local food security Principle 8 Soil Principle 9 Water Principle 12 Land Rights

This guidance document is applicable across relevant² certification standards, but HCV assessors should consult the relevant standards for requirements on HCV reporting and assessor credentials.

Investors and companies

In addition to the certification standards mentioned above, international financial institutions including commercial banks (e.g. signatories of the Equator Principle³ and development banks have developed lending policies that may refer to HCVs or similar approaches. For example, the International Finance Corporation (IFC) has developed a set of Performance Standards (PS) that cover a range of environmental and social topics of importance to investors. The IFC PS are used, either explicitly or implicitly, by many national development banks and commercial banks. Companies who receive funding from such financial institutions need to comply with environmental and social guidelines in their lending policy. In addition to access to finance, some multinational and national private sector companies are also including HCV assessments in their due diligence activities and in their social and environmental management systems.

2. Best practice considerations for HCV assessments

This section is not aimed at repeating information that is already available in other guidance documents but instead is intended to provide local context or Malaysia-specific guidance where relevant.

Further guidance on how to conduct an HCV assessment is provided in the Common Guidance for the Identification of HCVs as well as other relevant guidance documents by the HCVRN including the HCV Assessment Manual for its Assessor Licensing Scheme (2014).

An HCV assessment is the process by which HCVs are evaluated and identified in practice and is usually part of a certification scheme or a land use planning exercise. In carrying out an HCV assessment, its purpose should be made clear regardless of its scope, duration, cost and reporting requirements. The presence or absence of all six categories of HCVs should always be assessed in a way that is consistent with the HCVRN Common Guidance as well as this national interpretation. In summary, the key considerations when conducting an HCV assessment are:

- Using the **precautionary approach**⁴
- Scale, intensity and risk⁵
- Adherence to the HCVRN Charter
- Wider landscape considerations
- Stakeholder consultation
- Recognising significant value.

It should be noted that all items related to best practice in conducting HCV assessments as contained in the Common Guidance in the Identification of HCVs still apply even if they are not covered in the sections below.

²In addition to the above certification standards, the Aquaculture Stewardship Council (ASC) has standards on shrimp production that are relevant to the conservation of wetlands such as mangroves and peat forests. However, the ASC Shrimp Standard Ver. 1.0 March 2014 states that: *“The ASC Shrimp Standard considered the possibility of including High Conservation Value Area (HCVA) assessments and systematic conservation planning. HCVA methods are not sufficiently developed for freshwater and marine aquaculture systems at the current time”* (pg. 25).

³The Equator Principles is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making. For more information see: <http://equator-principles.com/>

⁴Principle 15 of the Rio Declaration on Environment and Development, adopted by the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, 1992, states that: *“In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”*

In the preamble of the Convention on Biological Diversity it is noted that: *“Where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.”* See also section 2.6.2 in the HCVRN Common Guidance for Identification of HCVs

⁵See section 2.1 in the HCVRN Common Guidance for Identification of HCVs

2.1 Scale and intensity

The Common Guidance for Identification of HCVs has provided definitions for scale and intensity (see Box 5, pg. 13 of the Common Guidance).

Table 2 below provides examples of smaller and larger scale and intensity of possible activities in a particular management unit.

The scale and intensity of the proposed development should inform the HCV assessors on the amount of resources required to conduct the assessments.

Table 2 is not meant to be exhaustive or prescriptive. The examples are meant to give assessors some ideas of what type of activities are considered to be of larger scale, lower scale, higher intensity and lower intensity. There are of course many other potential activities of various scales and intensity that are not provided in the table and would have to be assessed at the site level. Assessors may choose to conduct additional analyses including stakeholder driven processes such as the Limits of Acceptable Change (LAC)⁵ approach in order to get a more objective determination of the scale and intensity of activities in a given management unit.

Table 2: Examples of the scale and intensity of activities

LIKELY THAT LESS INTENSIVE HCV ASSESSMENT IS NEEDED	LIKELY THAT MORE INTENSIVE HCV ASSESSMENT IS NEEDED
SCALE OF ACTIVITIES	
Smaller Scale	Larger Scale
<ul style="list-style-type: none"> • Small-scale (≤ 50 ha) operations with small producers • Inputs (e.g. chemical) are relatively low and affect a small proportion of the total area • There are few, if any, buildings all of which are small in scale and mostly made of non-permanent materials. 	<ul style="list-style-type: none"> • Large scale (≥ 50 ha) conversion of natural vegetation • Permanent roads exist in most areas of the management area • Chemicals are regularly used in the majority ($\geq 50\%$) of the management area • Activities include development of infrastructure such as large permanent buildings, electrical and water supply systems etc. • Activities occur within an area identified as an ecological corridor.
Lower Intensity	Higher Intensity
<ul style="list-style-type: none"> • Planted areas are mostly mixtures of native species • Products are extracted to roadside by cable, by hand or by animals • Hunting, trapping and fishing occur rarely or in only a few restricted places • Grazing or browsing by domestic animals occurs rarely or only in on individual / private land • All or most of the natural ecosystems are designated as conservation areas, while intensive activities are limited to abandoned agricultural areas and shifting cultivation area. 	<ul style="list-style-type: none"> • Planted areas are mostly mono-specific and/or exotic species • Products are extracted to roadside with heavy machinery • Much of the area contains permanent roads and is visited by vehicles regularly • Hunting or trapping occur in most of the management unit • Grazing or browsing by domestic animals occurs in most of the management unit • Substantial abstraction of water and/or modification of downstream hydrologic flows • Modification of lateral or longitudinal hydrologic connectivity (e.g. levee construction, impoundments).

Source: Adapted from the Common Guidance on Identification of HCVs based on inputs from the NI process

⁵LAC is a framework for establishing acceptable and appropriate resource and social conditions, usually in the context of recreational or tourism use, within a natural area. It is a reformulation of the carrying capacity concept, with the primary emphasis on the conditions desired in the area rather than on how much use an area can tolerate. See for example Stankey *et al.* (1985) and SCBD (2007).

2.2 Assessing risk

Assessing existing and potential risks to HCVs is an important step in a given HCV assessment as the output of the risk assessment would inform the scale and intensity needed for the HCV assessment. Essentially, if the risk is higher, more resources are required for the HCV assessment and conversely if the risk is low, the scale and intensity of the HCV assessment can be reduced. The rationale is that if more information is gathered there will be a higher degree of confidence that HCVs are fully and accurately identified.

There are methodologies available for assessing risks such as the “Environmental Risk Assessment (ERA) for FSC certification in Tropical Forests” method which is recommended by the HCVRN⁷. Risk assessments can potentially be an elaborate exercise but at the very least simple checklists can be used to indicate the approximate level of risk found in individual management units.

Box 3 below is a sample checklist of potential vulnerabilities/risks in tropical forests that have been adapted to the Malaysian context.

Box 3 : Example checklist of potential vulnerabilities or risks to HCVs in Malaysia

- Harvested trees have inadequate natural regeneration rates
- Presence of hyper-endemic species in the management unit
- NTFP species (such as rattan and medicinal plants) are being over-harvested
- Hunted animals include “keystone” seed-dispersers of some harvested trees like fruit bats and hornbills
- The management unit contains threatened species, dependent on primary and/or undisturbed forest
- The management unit contains animals requiring large territories for foraging or breeding
- The management unit contains animals which depend on abundant fruiting seasons, affected by changes caused by logging or silvicultural treatments
- Some sites in the management unit are crucial for the breeding, roosting etc. of threatened species
- Designated conservation areas are threatened by fires, hunting etc.
- Forests in the region have already been fragmented
- Water bodies are liable to obstruction or contamination from rubbish, chemicals.
- Soils in harvested or cleared areas readily become saturated or waterlogged
- There is encroachment of the management unit by local communities and others
- There is soil erosion occurring in the management unit leading to sedimentation and deterioration of water quality and negative impacts on aquatic life.

Source: Adapted from the Common Guidance for Identification of HCVs based on inputs from the NI process

⁷<https://sites.google.com/site/environmentalriskassessment/home>

2.3 Adherence to the HCVRN Charter

According to the Common Guidance for Identification of HCVs, “the HCV process should be integrated with responsible natural resource management that respects the intent of the HCV approach and certain principles of the HCVRN charter” (pg. 14 of the Common Guidance). These include the following considerations:

Legality

- There is compliance with all applicable national and state laws and international treaties and agreements that have been ratified by the Malaysian government.
- In Malaysia, many of the values identified in HCV assessments already receive protection through land use designations, planning processes or other government regulations such as the existing laws on forestry, wildlife conservation, protected areas, environmental quality and so on.

Secure tenure, customary rights and consent

- The right to use the land can be demonstrated, and is not legitimately contested by local communities with demonstrable rights.
- Use or management of the land does not diminish the legal or customary rights, of indigenous peoples, local communities or other users, without their free, prior and informed consent (FPIC).
- Good land management should include proper economic planning for the wellbeing of communities that depend on that land.

Consideration of the impacts of conversion



Interviewing a Jakun community elder
Credit: Proforest/Tor Mooi See

The conversion of forest and other natural ecosystems into other land cover (e.g. agricultural land) generally has a more severe and irreversible impact on biodiversity, ecological functions and social systems as compared to management of natural ecosystems (e.g. as in the case of selective logging). The HCV approach does not rule out development or even conversion of natural ecosystems (only the most critically important or significant values) and some (but not all) HCVs can be maintained even in conversion scenarios through good management. The HCV approach requires that conversion has to be decided on a case by case basis, and resource managers must

ensure that adequate effort has been made to identify HCVs and that the precautionary approach is used. If areas within the management unit need to be conserved in order for HCVs to be maintained or enhanced, then those areas shall not be converted to other uses.

Note that the absence of HCVs alone should not be used to justify the conversion of natural ecosystems; there may be other environmental and social values worthy of protection. For example, local regulations may require that forested hill slopes beyond a certain threshold (usually 25°) should not be cleared for development even if there are no local communities at immediate risk from landslide or soil erosion (as in the case of HCV4).

In Malaysia, some development projects may be prioritised over the responsible management of HCVs. However, project proponents/resource managers who seek endorsement from certification schemes that adopt the HCV approach are expected to go beyond legal compliance. In other words, even if large scale conversion is acceptable or even encouraged by national governments, project proponents/resource managers should still ensure that any HCVs in relevant management units are maintained and/or enhanced. Otherwise they will face the risk of having their management units become uncertifiable to due non-compliance to HCV requirements.



Forest conversion to oil palm in Sabah
Credit: Proforest/Surin Sukswan

2.4 Location and landscape

As detailed in the Common Guidance for Identification of HCVs (see Section 2.3 of the Common Guidance), it is necessary to have an accurate location for the management unit in the form of geographic coordinates or maps. In the Malaysian context, the relevant maps are often certified plans of the relevant land lots which can be obtained from the respective state land offices or from the Department of Survey and Mapping (JUPEM) or forest concession maps issued by the relevant state forestry departments.

Knowing the accurate location of the management unit allows the assessor to get a first impression of whether it is feasible and appropriate to conduct an HCV assessment; what key environmental and social issues may be present; and potential impacts to protected areas and local people's resource use within the wider landscape.

It is important to assess whether the location of the management unit poses a serious risk to HCVs. Although macro land use plans (such as the National Physical Plan for Peninsular Malaysia), structure and local plans may be available, areas allocated for development activities or resource extraction may overlap with areas that are important for biodiversity conservation, environmental protection (e.g. Environmentally Sensitive Areas in the case of land use plans) and local community use.

As discussed in Section 2.3, the HCV assessor has a responsibility to respect the HCVRN Charter with regard to legality, land tenure and conversion issues. If it is clearly indicated from maps, desk research and stakeholder consultation, that proposed activities within a management unit may pose a serious risk to HCVs, the HCV assessor should recommend against proceeding with the project. However, in most cases, more information may need to be gathered during the HCV scoping and full assessment phases.

Although an HCV assessment should be conducted primarily at the production site scale i.e. the management unit, the **wider landscape context** (e.g. activities in neighbouring areas, land use plans in the region, the presence and status of protected areas, linked freshwater systems, etc.), need to be taken into consideration in order to minimise the risk of habitat fragmentation and threats to or impairment of some HCVs (which may exist outside of the management unit).

Therefore, the key social and biological features of the wider landscape should be clearly described, including information on:

- Protected areas (gazetted or proposed) and other reserved lands (e.g. forest reserves, Orang Asli reserves, NCR lands)
- Regional or sub-regional biogeography (is the management unit part of a distinct and/or narrowly restricted biogeographic region⁸)
- Location and status of areas of natural vegetation (including a description of ecosystem types, size, quality) – see Table 4 on distribution of ecosystems types in Malaysia
- Occurrence of known populations of species of global concern and migration corridors in the landscape – refer to national action plans for key species, IBA maps etc.
- Major landforms, watersheds and rivers, geology and soils e.g. peat domes, mountain ranges, limestone formations etc.
- Human settlements (including towns and villages) and infrastructure (major roads, railway lines, pipelines, electrical transmission lines, dams etc.), agricultural areas
- Social context (e.g. presence of indigenous communities, level of socioeconomic development, presence of hardcore poverty etc.)
- History of land use and development trends, including future plans (e.g. spatial planning maps, development initiatives and existing/proposed commercial exploitation and production licences).

2.5 Stakeholder consultation

The HCV approach is still an unfamiliar concept to most people in Malaysia, and therefore assessors should strive to make stakeholder consultations accessible and participatory. The HCV Common Guidance for Identification of HCVs and the HCV Assessment Manual provide generic guidance on how the public stakeholder consultation process should take place in order for it to be effective, independent and neutral.

As described in the Common Guidance, potential stakeholders must first be identified before the stakeholder consultation is carried out. This is done by considering the nature and vulnerability of the potential HCVs, and the risks and threats they face.

The list of relevant stakeholders can be divided into the following broad categories according to the Common Guidance for Identification of HCVs⁹:

- **Local communities** who use ecosystem products or services
- **Organisations and institutions** that represent these communities, in which case there is a need for verification that the community has appointed someone to speak on their behalf
- **Industry organisations/associations**
- Those whose **legitimate commercial use** of the natural resources will be altered by development activities
- **Environmental and social organisations**, that represent the wider public and/or have an interest in the way the ecosystems are managed
- **Federal and state government bodies** as the information source, natural resource manager and the need for them to be kept informed of discussions even if they are not directly affected
- Academics and researchers.

⁸See for example: Wong, K.M. 1998. Patterns of plant endemism and rarity in Borneo and the Malay Peninsula. In: Peng, C.-I & P.P. Lowry II (eds.) Rare, threatened and endangered floras of Asia and the Pacific Rim. Academia Sinica Monograph 16: 139-169.

The biogeographical regions in Malaysia identified by Wong (1998), based on plant diversity and endemism, are: the Riau Pocket in northwest Borneo, the East Coast Sabah floristic subprovince, the seasonal Asiatic-Australasian intrusion in North Borneo; the Riau Pocket in the eastern part of the Malay Peninsula; the west coast region of Peninsular Malaysia (including Perak state and adjacent parts of Kedah, Selangor and Penang island); and the Burmese-Thai floristic intrusion in the Malay Peninsula.

⁹see Box 9, pg. 19 of the HCVRN Common Guidance

2.6 Recognising significant value



Aleisanthia rupestris, a hyperendemic plant which is found only at the Klang Gates Quartz Ridge in Selangor

Credit: Proforest/Surin Sukswan

In the Common Guidance for Identification of HCVs, significant values are defined as “those recognised as being either unique, or outstanding relative to other examples in the same region, because of their size, number, frequency, quality, density or socio-economic importance, on the basis of existing priority frameworks, data or maps, or through field studies and consultations undertaken during the HCV assessment.”

Decisions on HCV status (present, potentially present, absent) will come from a sound interpretation of assessment findings, based on the agreed national interpretation of HCV definitions and the appropriate use of available sources of information. Within the HCV approach, development or even conversion of natural vegetation is possible but not when it involves the irreplaceable loss of significant values.

Table 3 below provides a framework for determining significant values based on limitations, challenges and opportunities in the Malaysian context. A fuller discussion of each value is presented in the relevant sections further down.

Table 3: Limitations, challenges & opportunities related to significant value

HCV	Opportunities for determining presence of significance values	Limitations/Challenges
HCV 1	<ul style="list-style-type: none"> International – Key Biodiversity Areas e.g. World Heritage Sites (natural), Ramsar Sites, ASEAN Heritage Parks National – protected areas included in the national protected area master list, and proposed protected areas Peninsular Malaysia – Environmentally Sensitive Areas (ESAs) as defined in the National Physical Plan RTE species identified through a combination of international assessments of threatened status (IUCN Red List) and national red lists Species included in the Totally Protected and Protected list of the relevant state and federal wildlife laws. 	<ul style="list-style-type: none"> Some subjectivity with regard to identification of rare and endemic species as there are no equivalent readily-available reference lists to consult, as in the case of the Red Lists for certain taxonomic groups. As such expert opinion is needed what level of rarity or endemism for a given species is considered to be significant In most cases, it is not feasible for a HCV assessor to conduct a scientifically robust study within the timeframe of a HCV assessment to determine the population of a given RTE species. Therefore, the best available data or expert opinion, including Traditional Ecological Knowledge (TEK), will have to be relied on. However, the available data need to be analysed carefully by the assessor as it cannot be assumed that all data have been collected by 'experts'.

<p>HCV 2</p>	<ul style="list-style-type: none"> • International – any area which is part of an Intact Forest Landscape • Peninsular Malaysia – any area which is within the CFS or part of a Primary Linkage (PL) or Secondary Linkage (SL) as defined in the Central Forest Spine (CFS) Master Plan and state CFS plans • Sabah – any area which is part of the Ecolinc corridor connecting Crocker Range Park with Kinabalu Park, ecological linkages between Maliau Basin, Danum Valley and Imbak Canyon, and along the Kinabatangan river which provides a critical “ridge to reef” linkage in the Eastern part of Sabah and the gazetted Totally Protected Areas (TPAs) • Sarawak – any area which is part of the Heart of Borneo area within the state, roughly corresponding to the areas surrounding the Sarawak-Kalimantan border. 	<ul style="list-style-type: none"> • The boundaries of some of the priority areas may not be very clearly defined or may not have been fully implemented by the relevant state authorities. Therefore, the assessor should check with the relevant state authorities to find out the implementation status of these priority areas.
<p>HCV3</p>	<ul style="list-style-type: none"> • National – critical or rare ecosystem types that are under-represented in the existing national protected area system, based on existing ecosystem assessments • National – protected areas included in the national protected area master list, and proposed protected areas • Peninsular Malaysia – Environmentally Sensitive Areas (ESAs) as defined in the National Physical Plan. 	<ul style="list-style-type: none"> • What are commonly referred to as “ecosystems” are essentially model ecological types that are defined according to geophysical criteria and the resident biological community. As such, different criteria may be used, based on the purpose of a given ecosystem assessment, resulting in different sets of ecosystem types • No single reference document –need to keep updated with latest developments.
<p>HCV4</p>	<ul style="list-style-type: none"> • National – natural water catchment areas of reservoirs connected to the public drinking water supply system • National – areas identified as critically important for soil and nutrient conservation • National – wetlands and other areas identified as critically important for flood prevention • Peninsular Malaysia – Environmentally Sensitive Areas (ESAs) as defined in the National Physical Plan • Local – natural watershed areas of village-level drinking water supply e.g. gravity-fed water supply system • Local – steep and erosion-prone slopes that need to be maintained in order to avoid landslides that directly impact on local communities in the surrounding area • Local – key nesting/roosting/feeding sites for pollinators of crops critically important for subsistence or livelihoods of local communities. 	<ul style="list-style-type: none"> • No single reference document –need to keep updated with latest developments • At the local level, need to analyse existing data and interpret maps (topography, hydrology etc.) in order to deduce whether significant values are present.

HCV 5	<ul style="list-style-type: none"> • Local – NTFPs/natural resources (including from non-forested sources) that are fundamental for satisfying basic necessities of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water) • In the Sabah context, this is well correlated with the Community Compartment in the Sustainable Forest Management Licence Area (SFMLA) or the Community Compartment Area (CCA) in Sabah REDD+. 	<ul style="list-style-type: none"> • Some subjectivity in determining what is critical for basic needs • Dependent on the scope and quality of stakeholder consultations conducted.
HCV 6	<ul style="list-style-type: none"> • International – areas/cultural practices with World Heritage status • National – areas/cultural practices with national or state heritage values • Local – areas/cultural practices of significant values that are determined by the local communities themselves. 	<ul style="list-style-type: none"> • Some subjectivity in determining what is cultural value • Cultural value is also dynamic as it changes over time • Dependent on the scope and quality of stakeholder consultations conducted • Some communities might not want to disclose their cultural sites.

The level of significance tend to move down the scale from international/national significance to locally-significant from HCV 1 to HCV 6. Also, for HCV 5 and HCV 6 it is difficult to have a more specific or standardised interpretation/description of significant value.

3. National Interpretation of HCVs

3.1 HCV 1 Species diversity

Words in **bold** in each HCV definition are treated in more detail in each section under key terms and concepts.

Concentrations of biological diversity including **endemic species**, and **rare, threatened or endangered (RTE) species** that are **significant** at global, regional or national levels.

3.1.1 Key terms and concepts

*Concentrations of biological diversity*¹⁰

HCV 1 covers significant concentrations of biodiversity, recognised as unique or outstanding in comparison with other areas within Malaysia and on the basis of priority frameworks or through field assessments and consultations.

Any area that contains significant concentrations of HCV 1 species (RTE or endemic), or which contains habitat critical to the survival of these species will be an HCV area. There is no threshold in terms of the number of species found in a particular area, to qualify as an HCV 1. A practical approach is to compare a particular area of interest with a relatively undisturbed natural area with similar characteristics and size which have been well documented in terms of its biodiversity.



A tiger detected through camera-trapping
Credit: WWF-Malaysia/Lau Ching Fong

¹⁰The definitions for biological diversity and species are provided in the Glossary. Although there is considerable philosophical debate in the scientific literature of what a species actually is (referred to as the 'species problem'), it is nevertheless a useful concept as it makes it possible to identify and quantify wildlife. For more information on the definition of species and the species problem. See for example: <http://biodiversitya-z.org/content/species>

Protected areas: a proxy for concentrations of biodiversity

As stated in the Common Guidance of Identification of HCVs, under the precautionary approach, a protected area (as defined by IUCN or national governments) are proxies for significant concentrations of biological diversity, and in the absence of information indicating otherwise, are assumed to contain HCV 1. Protected areas are usually not included within a management unit but may be found within the wider landscape and potentially affected by proposed activities in the management unit, especially if the protected area is located downstream or is connected via an ecological corridor. The main reference document for protected areas in Malaysia is the Master List of Protected Areas (in prep.) produced by the Ministry of Natural Resources. A partial dataset of the Master List of Protected Areas is available on the Malaysia Biodiversity Information System (MyBIS)¹¹.

Other global conservation priority sites such as Key Biodiversity Areas (including Important Biodiversity Areas, Important Plant Areas, AZE sites), and priority areas as identified in government action plans for individual species conservation¹² are strong indicators of the potential presence of HCV 1.

Rare, Threatened and Endangered (RTE) Species¹³

Only species with a conservation status of Vulnerable (VU) and above in either the IUCN Red List or the national red lists are considered to be threatened (see Fig. 2 below). The best available scientific data and expert opinion, including traditional ecological knowledge (TEK) (see for example Gadgil *et al.*, 1993; Berkes, 1999; Donovan & Puri (2004); Ng *et al.* (2017); Ruiz-Mallén & Corbera, 2013), should be used to determine whether the particular area harbours a significant population of an RTE species, or a significant enough mix of different RTE species to qualify as having a nationally significant concentration of biological diversity.

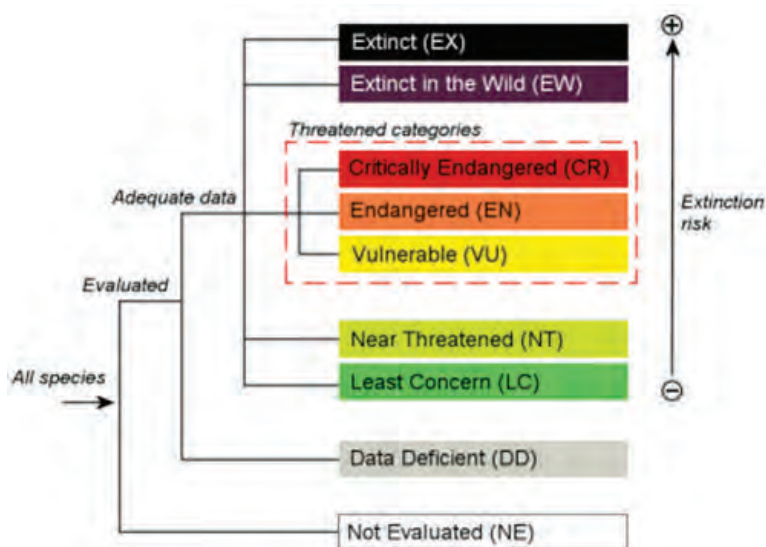


Fig. 2: Structure of the IUCN threat categories. The Threatened categories are Vulnerable (VU), Endangered (EN) and Critically Endangered (CR).

Source: IUCN (2012)

In determining the conservation status of species, the IUCN Red List should be referred to as well as national red lists where available. There are four Malaysian red lists available at the moment:

- i. Red List of Mammals for Peninsular Malaysia (DWNP, 2017)
- ii. Malaysia Plant Red List: Peninsular Malaysian: Dipterocarpaceae (Chua *et al.*, 2010)
- iii. Sarawak Plant Red List: Dipterocarpaceae Series I: *Dipterocarpus*, *Dryobalanops* & *Shorea* (Julia *et al.*, 2017)
- iv. Sarawak Plant Red List: Dipterocarpaceae Series II: *Anisoptera*, *Cotylelobium*, *Hopea*, *Parashorea*, *Upuna* & *Vatica* (Julia & Vilma, 2017)

¹¹<https://www.mybis.gov.my>

¹² Currently, government action plans for single species are available for the Malayan tiger (*Panthera tigris tigris*) and the Asian elephant (*Elephas maximus*) in Peninsular Malaysia; Bornean orangutan (*Pongo pygmaeus*), Asian elephant, Sumatran rhinoceros (*Dicerorhinus sumatrensis*) and crocodile (*Crocodylus porosus*) in Sabah

¹³ The Malaysian stakeholders note that there is an overlap in "Rare, Threatened and Endangered" species in that Endangered (EN) is a more severe level of Threatened status under the IUCN Red List framework.



Bornean endemic plant
Alocasia cuprea
Credit: Surin Sukswan

Based on expert opinion gathered during the stakeholder consultations held in developing this National Interpretation, there was a consensus that the Malaysian red lists of threatened species should be given precedence over the IUCN Red List for the corresponding taxa. The Malaysian red lists were produced through a robust assessments assessment involving local and international experts and more specific in scope on the conservation status of the relevant species within Malaysia, as compared to the IUCN Red List which has a global perspective.

There are species listed as Protected or Totally Protected under the Wildlife Conservation Act 2010 for Peninsular Malaysia, the Sabah Wildlife Enactment 1997 and Wild Life Protection Ordinance 1998. A Totally Protected or Protected status is an indication of HCV 1 presence but this must be corroborated with other indicators above (rarity, threatened status, endemism) as the protection status alone is not enough. This is because some of the species that are Protected or Totally Protected under Malaysian laws may be common or have a lower threat status within the IUCN or local red lists.

The inclusion of a given species in the CITES¹⁴ Appendix I means that the species is at high risk of extinction due to international trade. The definition of CITES Appendix I species are similar in spirit and content to IUCN's criteria for threatened species and therefore CITES Appendix 1 species may also be considered as potential HCV 1 species. To a lesser degree, CITES Appendices II and III may also be used as indicators for RTE species.

Rare species

Rarity is scale dependent and includes species that are

- Naturally rare, existing only in a few localities in low density;
- Rare because their population size has been impacted by human activities e.g. habitat destruction, overhunting, climate change; or
- At the limit of their natural distribution (even if they are common outside of Malaysia).

It should be noted that a species does not need to be endemic to be rare as it may be found (or even common) outside of Malaysia but rare within the country. Given the limitations above, HCV 1 presence based on the consideration of rarity alone should only be accepted if there is strong evidence that the species is very rare, based on best available science and expert opinion, including TEK.

Endemic species

Endemic species are plants and animals that exist only in one geographic region. Species can be endemic to the whole country or to a particular region of the country, or even to a single limestone outcrop or forest patch. A single threshold in terms of the size of the geographical range of endemic species is not a practical approach and therefore each endemic species needs to be assessed individually. For example, *Hopea sublancoolata* (merawan jeruai) is endemic to Peninsular Malaysia but its conservation status in the Malaysian Red List of Dipterocarps is only Near Threatened (NT), although it is assessed as CR in the IUCN Red List.

Endemism in the HCV context needs to be linked to some level of rarity or threat status that compensates and corrects for the scale factor. In other words, a species needs to be both endemic and rare, or endemic and threatened (VU and above) AND be present in nationally significant concentrations for it to be considered as a HCV1 species. However, an exception to this is made in the case of hyper-endemism (see below).

¹⁴The Convention on International Trade in Endangered Species of Wild Fauna & Flora (CITES) is an international treaty which came into force in 1975 and is aimed at ensuring that international trade in specimens of wild animals and plants does not threaten their survival. There are three CITES appendices: Appendix I is for species threatened with extinction, and trade in specimens of these species is permitted only in exceptional circumstances; Appendix II includes species not necessarily threatened with extinction, but for which trade must be controlled in order to avoid utilisation incompatible with their survival; Appendix III contains species that are protected in at least one country, which has asked other CITES Parties for assistance in controlling the trade.

Hyper-endemism is when a particular species has a very restricted distribution, usually in only one or a few isolated locations e.g. on a single limestone hill or mountain top. This is a very special form of endemism for which there is a high risk that the entire global population of a particular species can be wiped out. There is no standard definition of hyper-endemism and in the context of HCV assessments in Malaysia the assessor needs to consult the relevant expert(s) to determine whether a hyper-endemic species exist in the management unit. The presence of a hyper-endemic species following this definition is a strong indicator of the presence of HCV 1.

Spatial and temporal concentration of species

Many wild animal species use a variety of habitats at different times of the year or at different stages in their life-history including seasonal breeding sites, migration routes or corridors (latitudinal as well as altitudinal). In the tropics, the time of greatest use of a particular habitat may depend more on the ecology of the species concerned. For example, many migratory, temperate species may be critically dependent on tropical habitats for parts of the year, as in the case of migratory birds that spend their winter months in Malaysia and other parts of Southeast Asia. Some localities are particularly important because they harbour temporal concentrations of migratory waterbirds, such as the western coast of Johor and the Bako-Buntal Bay of Sarawak, both of which are IBA sites.



Fig trees provide a critical food source for RTE species such as this rhinoceros hornbill, particularly during certain times of the year when other fruits are scarce.

Credit: MNS/Yeap Chin Aik

Some species are difficult to detect during certain times of the year due to their breeding cycles, as in the case of some bats and invertebrates. Therefore, primary field data collection that is carried out over a short period during a particular time of year may result in an under-representation of species diversity. Ideally a repeat field assessment should be conducted during a different time of the year, but if that is not possible, consultation with relevant experts and a thorough review of secondary data is necessary to fill in data gaps.

Seasonal and ecological refuges and resources which provide temporary breeding, roosting, hibernation, migration sites or habitats essential for RTE species qualify for HCV 1, even when the habitat is only used in extreme years. These resources include mineral saltlicks which are essential for the survival of herbivorous mammals (see relevant case study on HCV 1).

Plants are not able to migrate as quickly as animals but their population sizes may fluctuate with, for example, changes in local weather patterns and availability of pollinators and dispersal agents. Areas where a particular plant species still persist even in the most unfavourable climatic conditions are essentially refuges and may qualify as HCV 1 or HCV 3.

3.1.2 Indicators and data sources

Indicators

Indicators of a potential presence of HCV 1 include:

- The presence of a hyper-endemic species as defined above (strong indicator)
- The presence of a protected area which is listed in the Master List of Protected Areas in Malaysia¹⁵, and proposed protected areas.
- The presence of a biodiversity priority area recognised by reputable international bodies specifically Ramsar sites, UNESCO World Heritage sites, UNESCO Man and

¹⁵ The Draft Interim Master List of Protected areas dated 2014 is available upon request from the Ministry of Natural Resources and Environment and the finalised document is expected to be available publicly by early 2018.

Biosphere Reserves, Key Biodiversity Areas¹⁶ and ASEAN Heritage Parks and priority areas for the conservation of key species as identified in the relevant national action plans for these species

- Areas proposed for any of the above designations is a strong indicator of the presence of HCV 1. e.g. sites in the tentative list of World Heritage Sites
- For Peninsular Malaysia, the presence of Environmentally Sensitive Areas (ESAs) as defined in the National Physical Plan
- HCV 2 and HCV 3 areas are also indicators of the presence of HCV 1
- Areas confirmed to harbour a combination of nationally-significant populations of species with a conservation status of VU, CR or EN (according to IUCN and Malaysian red lists, with precedence given to Malaysian red lists), rare and endemic species, based on information gathered through at least one of the following methods:
 - i. field surveys aimed at determining the population of targeted species within the proposed management unit and surrounding areas (where applicable)
 - ii. species distribution maps published by the relevant wildlife authorities or in peer-reviewed scientific journals (i.e. best available scientific data)
 - iii. consultation with credible subject matter experts and local communities (TEK)
- An area that have a high degree of species richness, i.e. with a species diversity approximating that of a relatively undisturbed natural area of similar characteristics and size
- Presence of natural mineral saltlicks.

Data sources

A list of data sources for assessing HCV 1 in Malaysia is provided in Annex 1.

In addition, data should also be gathered using the following methods, where applicable:

- Consultation with relevant conservation experts on presence of RTE species and protected areas within the management unit and in the surrounding landscape etc.
- GIS analysis involving remote sensing data sets such as forest cover, hydrology, topography, distribution of RTE species (where data is available) etc.
- Field observations and measurements (e.g. tree size, density, age classes) to assess canopy cover, forest quality, signs of human activities (hunting, fishing etc.).
- Interviews with local communities on their knowledge related to RTE species, current and potential impacts on RTE species etc.



Field data gathering
Credit: WWF Malaysia

In some cases, the project proponent or concessionaire of the management unit itself may have carried out surveys for a period of time, in which case the data accumulated (e.g. camera trap photos, plant species inventories) can be used by the assessor.

¹⁶KBAs are seen as an 'umbrella' designation, which includes globally important sites for different taxa and realms, such as Important Bird and Biodiversity Areas (IBAs), Important Plant Areas (IPAs), Important Sites for Freshwater Biodiversity, and Alliance for Zero Extinction (AZE) sites.

See: <http://www.biodiversity-z.org/content/key-biodiversity-areas-kba>

3.1.3 Case study

HCV1 Case Studies: Mineral salt licks

Location of case study: Belum-Temengor, Perak

Ecosystem: Lowland/Hill dipterocarp forest

Saltlicks are naturally-occurring springs or ground that contains a high concentration of minerals, which herbivores ingest as a supplement to their nutrient-poor plant diet (Matsubayashi *et al.*, 2006; Robbins, 1993). In Peninsular Malaysia, saltlicks are utilised by most of the main tiger prey species like sambar deer, gaur, barking deer and wild boar. In general, natural saltlicks are neither widespread nor commonly-found, and are mainly distributed in lowland dipterocarp/hill dipterocarp forests less than 1,000 m in elevation – areas which are most vulnerable to development or logging. It is thought that insufficient effort is put into identifying saltlicks and even if they are identified and acknowledged as important areas for conservation, there are no existing guidelines as to how large an area around saltlicks should be protected. This conservation gap is precisely where science-based recommendations should come on board.

The following attributes of saltlicks conform with indicators of the presence of HCV 1 as prescribed by the HCVRN:

- Populations of multiple RTE species
- Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations either:
 - Year-round (e.g. key habitat for a specific species) or,
 - Seasonally, including migratory corridors, sites for breeding, roosting or hibernation, or refuges from disturbance



A saltlick in Ulu Muda, Kedah

As saltlicks are frequented by RTE species such as tapir, sambar deer, elephant and gaur the area around this resource will act as key habitats for some of these species. The saltlick's viability itself may also be dependent on securing and protecting these areas, as the surrounding buffered area may act as refuges from disturbances to the saltlick. Thus, the buffered area around the saltlick (Rayan *et al.*, 2013) is ideal to be recognised as an HCVMA. This is especially important as saltlicks are not only potentially degraded or destroyed by development or logging but are also exploited by poachers that hunt ungulates. Under the Wildlife Conservation Act 2010 (which covers Peninsular Malaysia), hunting is prohibited in a radius of 400m from saltlick.

References

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Text : Christopher Wong & Mark Rayan, WWF-Malaysia

Photo : Surin Sukswan, WWF Malaysia

HCV 1 Case Study: Applying the precautionary principle for *Betta chini*

Location of case study: Beaufort, Sabah

Ecosystem: Peat swamp



Location of Beaufort in Sabah

The presence of HCV 1 species is to a certain extent dependent on its IUCN conservation status. For a threatened species, its habitat can potentially be considered under HCV 1 or HCV 3. However, since Malaysia is located in the mega-biodiversity Sundaic region where many species remain undiscovered, the IUCN Red List cannot be expected to assess the conservation status accurately for every species. An indication of this is the prevalence of species categorised as Not Evaluated (NE) and Data Deficient (DD) or given a lower threat status than expected (NT or LC).

Betta chini is an endemic species and it is currently only known from Beaufort, Sabah (Ng, 1993). Its current status in the IUCN Red List is VU. However, prevailing economic land use pressures in the Beaufort region has resulted in the severe fragmentation of *B. chini*'s habitat. It is not easy to encounter or capture this fish due to its obscure behaviour and rarity, and therefore it is difficult to estimate its population. This situation is not unique to *B. chini*. In the case of Sabah alone, Ng *et al.* (2017) reported that 68.6% and 7.3% of native freshwater fish species are identified as "not available" and DD respectively by the IUCN Red List.



Betta chini

In early 2017, a field researcher conducting a traditional ecological knowledge (TEK) interview with the local indigenous Bisaya community in Beaufort found out that some village elders had seen *B. chini*. They were familiar with the species and referred to it by its vernacular name *tingkang*. Apparently, back in the 60s, this fish species was abundant and was nicknamed *ikan bilis* (anchovy) as it was caught for food. According to locals, it is now exceptionally rare but occasionally an individual may be caught together with other small fishes in fine mesh traps set up by local children in the peat swamps.

The lesson learnt from this case study is that collecting information from the local communities need not be confined to meeting the requirements for HCVs 5 and 6. Local or indigenous communities should also be consulted for inputs on RTE species and habitats. TEK is very valuable and this approach is already widely applied around the world for collecting data (Gadgil *et al.*, 1993; Berkes *et al.*, 2000; Turnhout *et al.*, 2012).

Note: This also a case study for TEK, precautionary principle and hyper-endemicity.

References:

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Ng, C.K.C., F. Abdullah, H. Biun, M.K. Ibrahim, S. Mustapha & A. Sade. 2017. Review: A working checklist of the freshwater fish diversity for habitat management and conservation work in Sabah, Malaysia, North Borneo. *Biodiversitas* 18: 560-574.

Turnhout, E., B. Bloomfield, M. Hulme, J. Vogel & B. Wynne. 2012. Conservation policy: Listen to the voices of experience. *Nature* 488:454–455.

Text : Casey Ng, Forever Sabah

Photo : Casey Ng, Forever Sabah

HCV 1 Case Study: *Hopea subalata*, a hyper-endemic Dipterocarp species

Location of case study: Kanching Forest Reserve (FR), Selangor

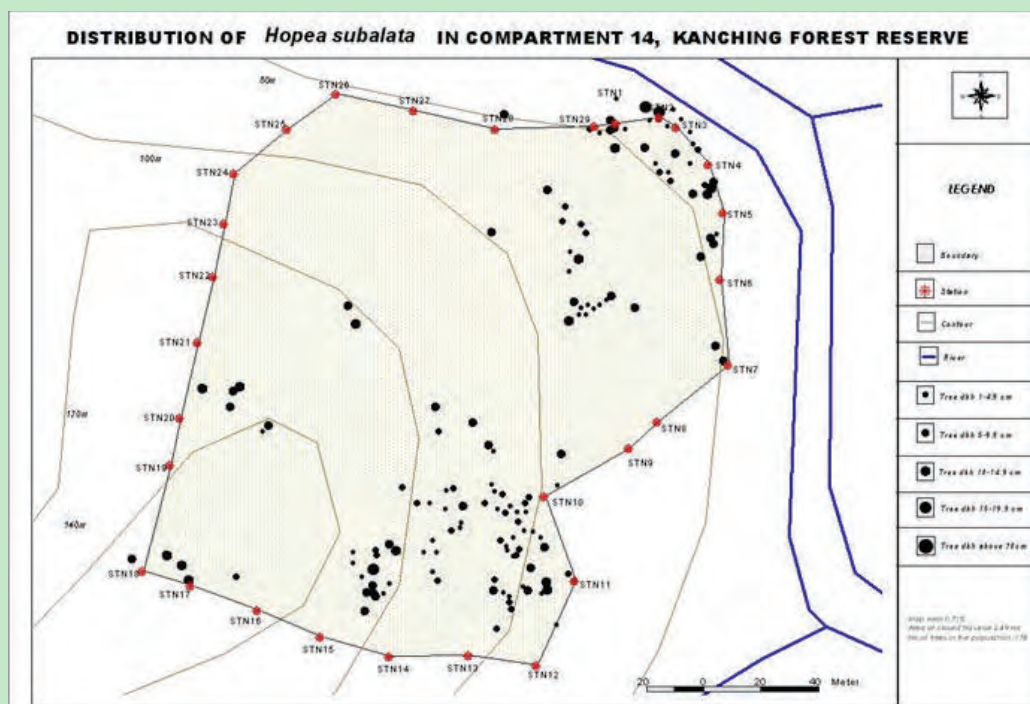
Hopea subalata (merawan kanching) is a hyper-endemic species known from Kanching FR in Selangor. This species is found on undulating land up to 140m above sea level. It shows a preference for low ridges and gentle hill slopes, but can also be found along stream banks.

In the reserve, Chua *et al.* (2004) recorded 266 trees (greater than 1 cm diameter) in Compartment 2 and 177 trees in Compartment 14. Currently, both populations are conserved in a HCVF. The first HCVF was established in Compartment 2 in 2007 with an area of 5.76 ha. Subsequently in 2010, a second HCVF (6.25 ha) was established in Compartment 14 (Chua *et al.*, 2012).

The Selangor Forest Department and State Government have continued to show strong commitment and support towards the conservation of the species by ensuring that infrastructure development such as the LATAR Highway and the Rawang Bypass did not cause unnecessary tree loss or significant encroachment into the reserve. Many stakeholder dialogues were held during the planning phase of the development which began in 2007. The HCVF and population remain intact and are being closely monitored by the Selangor State Forestry Department and the Forest Research Institute Malaysia (FRIM).



Flowers and leaves of *Hopea subalata*



References:

- Chua, L.S.L., H. Nurulhuda, M. Hamidah & L.G. Saw. 2004. Conservation Status of *Hopea subalata* (Dipterocarpaceae) in Peninsular Malaysia. *Journal of Tropical Forest Science* 16(3): 271-282.
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Text : Lillian Chua and Wendy Yong, FRIM

Photo : Lillian Chua, FRIM

3.2 HCV 2 Landscape-level ecosystems and mosaics

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



A landscape level forest in Belum-Temengor, Perak
Credit: Proforest/ Surin Sukswan

3.2.1 Key terms and concepts

Large, landscape level ecosystems and ecosystem mosaics

HCV 2 includes ecosystems and ecosystem mosaics that are sufficiently large to support viable populations of the great majority of the naturally occurring species and (implicitly) the great majority of other environmental values occurring in such ecosystems. The ecosystems present in a particular landscape may be made up of units at different ecological successional stages (i.e. mosaics) which are dynamic. Given biological connectivity to 'source' areas, these disturbed areas may recover to a late succession community resembling the natural or pristine state of the particular ecosystem.

In principle, the threshold size for HCV 2 should be related to the area needed to maintain viable populations, especially of large or wide-ranging species. The Intact Forest Landscape (IFL)¹⁷ concept (see Box 3 below) uses a threshold value of 500km² or 50,000ha (and a minimal width of 10km) and this has been widely used as a guideline for various conservation initiatives. This threshold figure was reaffirmed through the HCV National Interpretations process¹⁸. However, there was concern raised that the mapping of IFL is reliant on data sourced from the Global Forest Watch (GFW) datasets including on tree cover loss which may contain inaccuracies. Therefore, the assessor should still refer to the Ministry of Natural Resources and Environment (NRE) and the relevant state forestry departments for data on the forestry sector.

¹⁷For further information see: <http://www.intactforests.org/>

¹⁸During the National Interpretation consultation process, it was pointed out that for tigers, 500km² isn't considered large enough as it cannot hold a significant population of tigers which occur at low densities. At very best, an area this size might be able to hold some 10-15 tigers. At densities of 1 tiger/100sq.km, a minimum of 8,000km² is needed but that assumes that enough prey is available and the enough protection is afforded. This is very much not the case in most forest habitats in Malaysia. The ideal tiger conservation landscapes are large tracts of forest (>10,000 km²) which are protected from poaching and that are linked via functioning corridors.

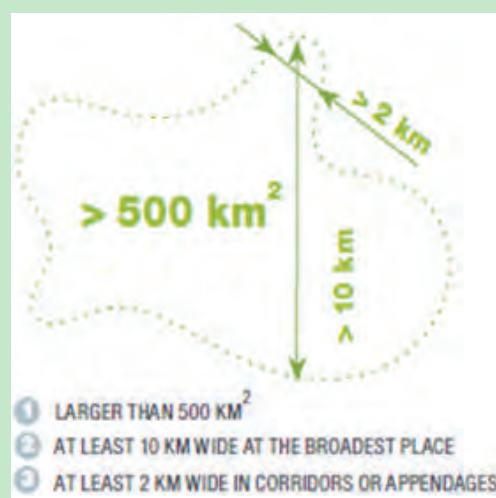
Intact Forest Landscape (IFL)

An IFL is an unbroken expanse of natural ecosystems within the zone of current forest extent, showing no signs of significant human activity and large enough that all native biodiversity, including viable populations of wide-ranging species, could be maintained. Although all IFL are within the forest zone, some may contain extensive naturally tree-less areas, including grasslands, wetlands and lakes.

Technically, an Intact Forest Landscape (IFL) is defined as a territory within today's global extent of forest cover which contains forest and non-forest ecosystems minimally influenced by human economic activity, with an area of at least 500 km² (50,000 ha) and a minimal width of 10 km (measured as the diameter of a circle that is entirely inscribed within the boundaries of the territory).

Areas with evidence of certain types of human influence are considered disturbed and consequently not eligible for inclusion in an IFL:

- Settlements (including a buffer zone of 1 km);
- Infrastructure used for transportation between settlements or for industrial development of natural resources, including roads (except unpaved trails), railways, navigable waterways (including seashore), pipelines, and power transmission lines (including in all cases a buffer zone of 1 km on either side);
- Agriculture and timber production;
- Industrial activities during the last 30-70 years, such as logging, mining, oil and gas exploration and extraction, peat extraction, etc.



Areas with evidence of low-intensity and old disturbances are treated as subject to "background" influence and are eligible for inclusion in an IFL. Sources of background influence include local shifting cultivation activities, diffuse grazing by domestic animals, low-intensity selective logging, and hunting.

Source: Adapted from <http://www.intactforests.org/concept.html>

Ecological linkages between large forest complexes are critical areas needed to maintain viable populations. Within the Peninsular Malaysia context, it can be assumed that HCV 2 exist in areas within ecological linkages (primary and secondary linkages) as identified in the Central Forest Spine Masterplans¹⁹. For Sabah, priority ecological linkage areas are those within the Ecolinc corridor connecting Crocker Range Park with Kinabalu Park, ecological linkages between Maliau Basin, Danum Valley and Imbak Canyon, the Ulu Padas area and along the Kinabatangan river which provides a critical "ridge to reef" linkage in the eastern part of Sabah and the gazetted Totally Protected Areas (TPAs). In the case of Sarawak, priority ecological linkages are the Heart of Borneo area within the state, roughly corresponding to the areas surrounding the Sarawak-Kalimantan border.

¹⁹It is noted that ecological linkage areas identified in the CFS Master plans comprise Permanent Reserved Forests (PRFs), stateland and private land (alienated land). In a given HCV assessment, the assessor will need to take note of HCV 2 within the management unit and within the wider landscape (but outside the management unit). For areas within the management unit, it can be assumed that the project proponent will have considerable rights to determine what happens within that area and must therefore ensure that the intended activity would not lead to the loss or degradation of the HCV 2 value. Within the wider landscape, the project proponent will not be directly responsible for the management and monitoring of the HCV 2 but should make sure that there is no spill-over/downstream effect from the project activity that can destroy the HCV 2 value outside of the management unit

The objective of the HCV assessment is to determine whether there is HCV 2 present within or in the vicinity of the management unit. Within the management unit, management prescriptions can be provided but within the larger landscape there will be other stakeholders involved. In some cases there are areas that are already within protected areas for which legal provisions for protection and management are in place. Having HCV 2 management and monitoring practices within the management unit would complement conservation efforts by other stakeholders.



Asian elephants (*Elephas maximus*) require landscape level habitats for their survival.

Credit: Proforest/ Surin Suksuwan

The project proponents/resource managers responsible for the management unit are expected to engage other stakeholders in managing and monitoring HCV 2 outside of the management unit. This engagement should be aimed at achieving conservation outcomes beyond complying with existing national or state policies and land use plans, and will often require an active partnership involving the project proponent, government agencies, neighbouring land owners, NGOs and local communities.

Viable populations of the great majority of species

Most large landscapes, which have not been affected by clearance, unsustainable logging, over-hunting, damming or straightening of waterways, or other major anthropogenic disturbances for several decades, probably contain viable populations of the great majority of the naturally occurring species. To qualify for HCV 2, it is not necessary that the area is totally undisturbed or pristine. Some species may be locally extirpated or missing, including large, keystone or iconic species. HCV 2 often includes ecosystems that contain important sub-populations of wide-ranging species (e.g. tiger and elephant) even though the sub-populations themselves may not be viable in the long term.

Areas with a great majority of the naturally occurring species in Peninsular Malaysia include Intact Forest Landscapes and the Central Forest Spine.

Natural patterns of distribution and abundance

Relatively intact ecosystems, where ecological processes and functions are wholly or relatively unaffected by human activities have special ecological importance. Even a large ecosystem may not qualify for HCV 2 status if it has lost many of the species typical of such ecosystems in their natural state or has been so heavily disturbed that there is reason to believe that the spatial distribution of species and their relative abundance and regeneration has been seriously and permanently altered. HCV 2 does not include man-made, converted, heavily degraded or fragmented ecosystems, extensively modified, by human activity, especially land clearance and farming. HCV 2 is also ruled out in ecosystems with features such as dominance or significant presence of invasive species, disrupted age/size class distributions of populations, and a loss of significant ecosystem processes (e.g. fruit masting, dispersal of key species, succession and stabilising equilibrium).

3.2.2 Indicators and data sources

Indicators

Areas recognised as Intact Forest Landscapes as shown in the relevant IFL and WRI websites are required by HCVRN to be accepted as having HCV 2 present. The online IFL map available at <http://www.intactforests.org> shows that IFLs exist in Malaysia at the following areas: Ulu Muda in Kedah, Belum-Temengor in Perak, the Main Range at the Perak-Kelantan border, Taman Negara and surrounding areas, Krau Wildlife Reserve, Kinabalu National Park, part of the Crocker Range, the Danum Valley area, Mulu National Park and Lanjak-Entimau Wildlife Sanctuary & Batang Ai National Park.

Indicators of a potential HCV 2 presence include:

- Areas in Peninsular Malaysia identified as CFS areas and ecological linkages (both primary and secondary linkages) under the Central Forest Spine Masterplans I and II, as well as state CFS plans. However, the assessor should still refer to the relevant state authorities to confirm the implementation status of the primary and secondary linkages of interest
- Areas in Sarawak included within the boundary of the Heart of Borneo
- Areas in Sabah included within the Ecolinc Corridor, Ulu Padas area, ecological corridors/linkages between Maliau Basin, Danum Valley and Imbak Canyon and the Kinabatangan Corridor of Life.

Data sources

A list of data sources for assessing HCV 2 in Malaysia is provided in Annex 2

In addition, data should also be gathered using the following methods, where applicable:

- Consultation with conservation experts on priority conservation landscapes and their connectivity to the management unit etc.
- Land cover analysis using GIS and involving remote sensing data sets such as forest cover, hydrology, topography etc.
- Field observations and measurements (e.g. tree size, density, age classes) to assess canopy cover, forest quality, signs of human activities (resource extraction, localised forest clearance etc.).
- Interviews with local communities to assess level of human presence and activity etc.



A wildlife crossing between two forested areas in Peninsular Malaysia

Credit: Proforest/ Surin Suksuwan

3.2.3 Case study

HCV 2 Case Study: Heart of Borneo

Location of case study: Heart of Borneo comprising parts of three countries namely Brunei Darussalam, the Malaysian states of Sabah and Sarawak, and five Indonesian provinces in Kalimantan

Ecosystem: Tropical rainforest

Assessment context: HCV Assessment for forest management certification

Size of area: c.22,000,000 ha



Location of the Heart of Borneo

The Heart of Borneo (HoB) is the last expanse of intact tropical forests in the centre of Borneo. At 22 million ha, it is one of the largest transboundary rainforests remaining in the world, crossing the borders of three countries. The HoB covers a wide variation of biophysical attributes that range from lowland to highland and steep mountainous areas that are the source of major riverine systems of Borneo.

In Sarawak, many protected areas are located within the HoB, including the Batang Ai National Park (24,040 ha), Lanjak Entimau Wildlife Sanctuary (182,983 ha), Gunung Mulu National Park (85,671 ha) and Pulong Tau National Park (69,817 ha). Outside of these protected areas, there are other resource utilisation regimes that, when managed in a sustainable manner, provide large habitats for a diversity of wildlife. The HoB harbours unique ecosystems with Bornean endemic species. There are 62 forest bird species that are restricted to the montane region (Wells, 1985) of which 26 of them are Bornean endemics (Smythies, 1999). Montane mammals that are endemic to Borneo include the mountain treeshrew, smooth-tailed treeshrew, Whitehead's pygmy squirrel, Kinabalu rat, mountain ground squirrel and Hose's civet (Phillipps & Phillipps, 2016). Outside the protected area network, much of the forest has been licensed out to industrial scale logging, oil palm and tree plantation companies. Arising from these large scale industrial operations, the impact is forest degradation and deforestation, and eventual loss of biodiversity and ecosystem services.



A view of the highlands in HOB

To address this, the governments of Brunei Darussalam, Indonesia and Malaysia signed the Heart of Borneo Declaration in 2007 to provide a cohesive framework that promote sustainable natural resource management that transcends different land use regimes.

One forest management unit (FMU) in Sarawak located near the international boundaries with Sabah and Kalimantan engaged a third party to conduct an HCV assessment. One of the findings is that HCV 2 was present in the FMU. Two factors contributed to the presence of HCV 2:

- i. The FMU is located between the Gunung Mulu National Park at the north and Pulong Tau National Park at the south, which in turn are connected to forests in Brunei and to the 1.3 million ha Kayan Mentarang National Park in Kalimantan respectively. This strategic location makes the FMU a critical ecological and wildlife corridor for seed dispersal and wildlife migration
- ii. The FMU is located adjacent to the HOB.

Recognising the importance of the FMU as a HCV 2, and its links to the HOB and the surrounding protected areas, the FMU manager concurred with the assessors' recommendation to adopt Reduced Impact Logging (RIL) guidelines in the harvesting of timber resources. The FMU also agreed to implement wildlife corridors linking protected areas, and set aside riparian buffer zones with a width of 50m along the major rivers. For monitoring, aerial survey using satellite imagery and ground surveys would be periodically undertaken to ensure adherence of management prescriptions. Equally important are floristic surveys to monitor changes in the diversity and health of forest ecosystem.

References:

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Text: Henry Chan, Jason Hon, Cynthia Chin & Samantha Liew, WWF-Malaysia

Photo: WWF-Malaysia/Samantha Liew

HCV 2 Case Study: Ulu Padas

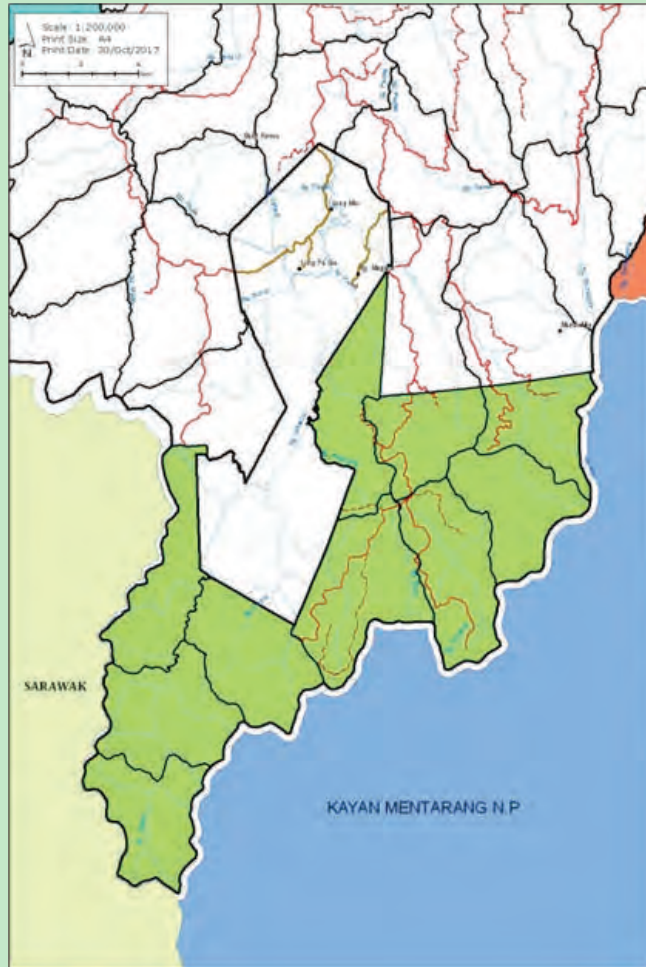
Location of case study: Ulu Padas Forest Reserve, Sipitang, Sabah

Ecosystem: Lower montane forest

Assessment context: HCV Assessment for FSC Certification

Size of area: 31,000 ha

Location of Ulu Padas



Location of the Ulu Padas Forest Reserve

The Ulu Padas Forest Reserve covering c. 31,000 hectares is located in the southwest corner of Sabah. The area is an integral part of the Heart of Borneo as it connects the forest in Sarawak and the Kayan Mentarang National Park in Indonesia to the rest of the forest in Sabah. Part of the area has undergone some timber harvesting, but the entire forest reserve stills forms an intact, landscape-level forest. The area is licensed by the Sabah State Government to a private company under a long term Sustainable Forest Management agreement. It is managed primarily for the production of high value timber while maintaining the ecosystem services and environmental values of the area. A reduced impact logging (RIL) system is employed to minimise negative environmental impacts. Establishment of wildlife corridors and river buffers linking the Crocker Range Park (in Sabah) in the north to the Kayan Mentarang National Park and the entire forest reserve still forms a landscape-level forest.

Text: Joan George, Sabah Forest Industries

3.3 HCV 3 Ecosystems and habitats

Rare, threatened, or endangered ecosystems, habitats or refugia.

3.3.1 Key terms and concept

HCV 3 includes **ecosystems**, habitats or refugia of special importance because of their rarity or the level of threat that they face or their rare or unique species composition or other characteristics.

Ecosystems are a “dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit”. However, what are commonly referred to as “ecosystems” are essentially model ecological types that are defined according to geophysical criteria and the resident biological community²⁰.

Within the context of this document, ecosystem is used for a geographic area which has plant and animal communities within a defined and thus mappable, geophysical area. This can contain many habitats for many different entities, e.g. lowland forest.

A practical approach is to use vegetation classifications or ecological types which are easily recognisable in the field as well as satellite images, aerial photographs and other remote sensing imagery. The major vegetation/ecological types in Malaysia are summarised in Table 4 below.

Table 4: Major vegetation/ecological types in Malaysia and their distribution in Peninsular Malaysia, Sabah and Sarawak

Vegetation/ecological type	Distribution		
	Peninsular Malaysia	Sabah	Sarawak
Lowland dipterocarp forest	✓		
Hill dipterocarp forest	✓		
Mixed dipterocarp forest		✓	✓
Mixed dipterocarp forest on ultisols		✓	✓
Forest on ultramafic rocks		✓	✓
Semi-evergreen rainforest	✓		
Lower montane forest (montane oak-laurel forest)	✓	✓	✓
Upper montane forest (montane ericaceous forest)	✓	✓	✓
Heath vegetation/kerangas	✓	✓	✓
Limestone forest	✓	✓	✓
Beach vegetation	✓	✓	✓
Marine alluvial (mangrove) swamp forest	✓	✓	✓
Brackish water vegetation	✓	✓	✓
Peat swamp forest	✓	✓	✓
Freshwater swamp forest	✓	✓	✓
Riparian vegetation	✓	✓	✓
Quartzite vegetation	✓		
Disturbed vegetation and regenerated forests	✓	✓	✓

Source: Kiew et al. (2010), Soepadmo & Wong (1995)

²⁰Different criteria may be used, based on the purpose of a given ecosystem assessment, resulting in different sets of ecosystem types. Whatever ecosystem type proposed can be expanded or subdivided according to specific needs e.g. coastal lowland forest is a subdivision of lowland dipterocarp forest. Depending on their defined physical form, an ‘ecosystem’ may overlap many of those model ecological types while some smaller ecosystems (e.g. ponds, caves) may be contained within these ecological types.

The model ecological types shown in the table above were developed by foresters and biologists working over the last 90 years or so. For example, Symington (1943), Wyatt-Smith (1964) and Whitmore (1984) classified the forest vegetation of Peninsular Malaysia into several types based on local climatic and edaphic conditions and plant communities, which are also applicable to Sabah and Sarawak (Manokaran, 1992).

Some ecosystem types are naturally rare, but some others are becoming increasingly threatened by human activities. For example, quartz vegetation is rare because of its naturally limited extent while lowland forest types are threatened due to conversion to other land uses. Due to rapid changes, existing data may be outdated and therefore assessors should always refer to current expert opinion for confirmation.

In the case of Peninsular Malaysia, an analysis of the threatened status of ecosystem types was conducted as part of a collaborative project between the Ministry of Natural Resources & Environment and the Danish International Development Assistance (DANIDA) on biodiversity mainstreaming which ended around 2010. The main results of the analysis are reproduced as Annex 7 below comprising a map showing the distribution of ecological types in Peninsular Malaysia (as of 2006) and a table which provides the percentage of the current extent of each ecological type against its original extent, and percentage of the original extent within protected areas (and therefore assumed to be protected). An arbitrary threshold value of 10% was used to determine which of the ecosystem types are considered to be critically endangered (CR).

These CR ecosystem types (highlighted in yellow in Annex 7) are:

- Mangrove forest
- Beach vegetation
- Peat swamp forest
- Limestone vegetation
- Vegetation on ultrabasic soil
- Heath vegetation.

The presence of these CR ecosystems in the proposed management unit or within the surrounding landscape determines a strong indicator of HCV3 presence.

There is also an earlier ecosystem assessment comprising 27 model ecological types in Peninsular Malaysia commissioned by the Department of Wildlife and National Parks (DWNP, 2004). This assessment examined the extent of the original area of the ecological types that remained in 1992 and the level of risk (i.e. 'high' or 'low') from external threats at that point in time.



Vegetation on limestone next to the Kinabatangan river in Sabah
Credit: Surin Suksuwan

For ecosystem types that have not been assessed as critical, the assessor should get more up-to-date information before determining whether HCV 3 is present or not.

While there may have been similar ecosystem assessments done for Sabah and Sarawak the results are not readily available. It is recommended that assessors contact relevant state agencies in order to get information on the conservation status of ecosystems found in those states.

It is noted that this method differs from that prescribed by the IUCN Red List of Ecosystems²¹ which is a relatively new initiative. The IUCN Red List of Ecosystems uses thresholds for reduction in geographic distribution of ecosystem area over the past 50 years, i.e. CR \geq 80%; EN \geq 50% and VU \geq 30%, without taking into account the protection status of the remaining ecosystem areas. An assessment of ecosystems in Malaysia using the IUCN Red List of Ecosystems approach has yet to be conducted and assuming that such an assessment will be conducted in future, the results could be incorporated into future versions of the Malaysia HCV toolkit.



A mangrove swamp forest in southern Johor
Credit: Surin Sukswan

The assessment of ecosystem types in Malaysia needs to be refined as more data becomes available (especially for Sabah and Sarawak) and assessment methods improve. As such, other supporting information from published sources and expert opinion should be obtained in considering ecosystems, other than those identified as CR above, as potential HCV 3. For example, the National Policy on Biological Diversity 2016-2025 identified lowland dipterocarp forests and wetlands as being especially vulnerable ecosystems in Malaysia (NRE, 2016).

Habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. The term typically refers to the zone in which the organism lives and where it can find food, shelter, protection and mates for reproduction. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.

Within the context of this document, habitat is used to describe the range and conditions where a particular species or type of plant or animal are limited to. **Habitats** can range across many different ecosystems, e.g. **habitat** of an elephant.

Refugia: There are two types of refugia (or refuges) which may be considered a HCV (in addition to seasonal refuges considered under HCV 1):

- Ecological **refugia:** Isolated areas which are sheltered from current changes (e.g. human threats or climatic events), and where plants and animals typical of a region may survive; and
- Evolutionary **refugia:** areas where certain types or suites of organisms persisted during a period when climatic events (e.g. glaciations) greatly reduced habitable areas elsewhere. Such **refugia** often support high overall species richness and significant numbers of endemic species.

A practical interpretation of **refugia** is that it is a place where a declining entity is making a last stand e.g. as in the case of *Betta chini* at Beaufort (see the relevant case study for HCV 1).

²¹The IUCN Red List of Ecosystems Categories and Criteria is a global standard for how we assess the conservation status of ecosystems, applicable at local, national, regional and global levels. The Red List of Ecosystems evaluates whether ecosystems have reached the final stage of degradation (a state of Collapse), whether they are threatened at Critically Endangered, Endangered or Vulnerable levels, or if they are not currently facing significant risk of collapse (Least Concern).

For more information see: <https://iucnrl.org/> and <https://portals.iucn.org/library/node/45794>

3.3.2 Indicators and data sources

Indicators

For Peninsular Malaysia only, the occurrence of CR ecosystem/habitat types (as described above) in the proposed management unit confirms the presence of HCV 3.

Indicators of a potential HCV 3 include:

- Any natural ecological/vegetation type may be considered to be an RTE ecosystems and further supporting evidence (e.g. scientific data or expert opinion indicating the importance of the ecosystem type in the regional or national context) is needed before HCV 3 presence can be confirmed
- The presence of a protected area which is listed in the Master List of Protected Areas in Malaysia, and proposed protected areas
- For Peninsular Malaysia, the presence of Environmentally Sensitive Areas (ESAs) as defined in the National Physical Plan
- Where ecosystem proxies (e.g. vegetation maps) strongly indicate the presence of CR ecosystems, even if these are inaccessible or have not been confirmed on the ground. In cases where detailed vegetation maps are not available, GIS modelling (based on soil type, elevation and climate) can be done to give suitable proxies for vegetation units
- Any ecological/vegetation type considered to contain RTE species
- For all of the above, even modified natural areas may be considered if the extent of degradation is not too severe as to prevent natural regeneration and ecological succession.

Data sources

A list of data sources for assessing HCV 3 in Malaysia is provided in Annex 3.

In addition, data should also be gathered using the following methods, where applicable:

- Consultation with conservation experts on presence of RTE ecosystem/vegetation types within the management unit and in the surround landscape
- GIS analysis to map the distribution of RTE ecosystem/vegetation types (where data is available) etc.
- Field observations and measurements (e.g. tree size, density, age classes) to assess canopy cover, ecosystem quality, signs of human activities (hunting, fishing etc.).
- Interviews with local communities on their knowledge related to RTE ecosystem/vegetation types, current and potential impacts on ecosystems etc.

3.3.3 Case study

HCV 3 Case Study: Peat swamp forests

Location of case study: 3 districts in Selangor – Kuala Selangor, Hulu Selangor & Sabak Bernam

Ecosystem: Peat swamp forest

Size of area: 81,304ha



Location of the North Selangor Peat Swamp Forest

Peat swamp forest is listed as a vulnerable ecosystem (under wetland) in the National Policy on Biological Diversity (2016-2025) and covers about 8% of the total land mass in Malaysia. Its extent had been heavily impacted by development especially conversion to oil palm. Remaining peat swamp forests are rarely in pristine conditions; most had undergone various intensities of disturbance, most notably logging, often with canals either for transportation or drainage.

The North Selangor Peat Swamp Forest or NSPSF is located on a flat coastal plain in the northern part of Selangor. It consists of four forest reserves i.e. Raja Musa Forest Reserve, Sungai Karang Forest Reserves, Bukit Belata Extension Forest Reserve (partial) and Sungai Dusun Forest Reserve/ Sungai Dusun Wildlife Reserve with a combined total of 81,304ha. Approximately 95% of the total area is found on peat.

This area was extensively logged in the 1980s prior to the gazettal of forest reserves in 1991, and the existing forest stand is highly depleted. Nonetheless, this logged-over forest still harbours many fauna and flora species that are worth protecting (Selangor State Forestry Department, 2014):

- 77 tree species have been recorded from the area, with one species categorised as VU and two as EN
- 92 bird species have been recorded, with 14 NT species
- 69 fish species have been recorded with two VU species, two NT species and two EN species
- 46 species of mammals have been recorded with one VU species and two EN species

NCPSF is surrounded by development – oil palm estates, paddy fields, and sand and clay mines. Most of the activities required drainage to lower the water table first. Although the drainage canals are located outside the boundary of the forest reserves, the negative impacts extent into the forest reserves. This is because of the interconnected hydrology of the peatlands; the drainage has led to forest degradation, subsidence and fire risk. For example, portions of the forest reserve had been affected by fire for the past 10 years, due to the spread of fire from adjacent land.

References:

NRE. 2016. *National Policy on Biological Diversity (2016-2025)*. Ministry of Natural Resources and Environment (NRE), Malaysia.

Selangor State Forestry Department. 2014. *Integrated Management Plan for North Selangor Peat Swamp Forest 2014-2023*. Vol. 1 and Vol. 2.

Text: Julia Lo, GEC

3.4 HCV 4 Ecosystem services

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

3.4.1 Key terms and concepts

Basic ecosystem services

Ecosystem services are the benefits people obtain from ecosystems, including:

- provisioning services such as food and water
- regulating services such as regulation of floods, drought, land degradation, and disease
- cultural services such as recreational, spiritual, religious and other nonmaterial benefits
- supporting services such as soil formation, pollination and nutrient cycling.

HCV 4 is essentially about supporting and regulating services while provisioning and cultural ecosystem services overlap more directly with HCV 5 and 6 which are discussed in more detail in later sections. Relevant supporting and regulating services are flood regulation, water purification, climate regulation, disease regulation, genetic resources, soil formation, pollination, nutrient cycling and primary production. See also Table 2 (pg. 37) in the Common Guidance for Identification of HCVs.

Such basic services become HCV 4 in critical situations (see below).

Basic ecosystem services are essential to the safety and health of local communities. The term “ecosystem services” is used in the National Policy on Biological Diversity and the 11th Malaysia Plan, however both these documents did not define the term and rely on the common interpretation of “ecosystem services”. It can be concluded that the key Malaysian environmental policies have mainstreamed the term “ecosystem services” and generally agree with the HCVRN Common Guidance definition.

Critical situations

An ecosystem service is critical where a disruption of that service poses a threat of severe, catastrophic or cumulative negative impacts on the welfare, health or survival of local communities, on the functioning of important infrastructure (roads, dams, reservoirs, hydroelectric schemes, irrigation systems, buildings, etc.), or on other HCVs. For example, local communities could be impacted by soil erosion or landslide if their village is located at the foot of a hill, or by river pollution happening upstream from their village.

Protection of water catchments and control of erosion of vulnerable soils and slopes

An area may be considered HCV 4 if the vegetation cover in the area provides a function in regulating the flow of water within a catchment. This service may be considered critical in the following situations:

- when people are dependent on the water for drinking or irrigation
- where the regulation of water flow guarantees the existence of fishing grounds or agricultural land on which the local people are dependent
- where there are no viable or readily available alternatives.

HCV 4 also occurs in areas that contain natural vegetation types (e.g. forest) in good condition that help to prevent erosion and landslip where such events would have a critical impact on people or the environment. Such impacts might be catastrophic (landslides) or difficult to reverse (gradual loss of soil fertility and land productivity). Surface erosion causes the loss of top-soil, which leads to decreasing land productivity. Landslides and ravines reduce the area of productive lands, damage infrastructure, endanger human lives, change a watershed's hydrology characteristics, and increase sediment loads, which causes siltation of water bodies and irrigation channels. This is particularly important for farming and fishing communities, and for freshwater or coastal biodiversity.

In Peninsular Malaysia, protection of water catchments and control of erosion of vulnerable soils and slopes are ecosystem services usually provided by Permanent Reserved Forests (PRFs) classified under section 10(1) of the National Forestry Act 1984²³ as protection forests for water catchment, and soil protection (amongst other categories for forest protection). There are provisions for water and soil protection under the Sabah Forest Enactment 1968 although there are no PRF protection classes specific to water and soil. There are also other state laws that allow for protection of water catchment areas e.g. the Selangor Waters Management Authority (LUAS) Enactment 1999, the Johor Water Enactment 1921, the Sabah Water Resources Enactment 1998 and the Sarawak Water Ordinance 1994.

However, not all sites providing these basic ecosystem services have been legally gazetted including water catchment areas of some reservoirs that are part of the public drinking water supply systems in various parts of the country. Thus, identification of areas providing these basic ecosystem services must also consider other national and state policy documents including the National Physical Plan (NPP)²⁴, National Water Resources Study, relevant structure and local plans as well as available hydrological studies. In the case of Sabah, the Department of Irrigation and Drainage has identified the location of all water catchment areas in the state and the reports are available from the department.

If the ecosystem services provided by the water catchment or soil protection area is of critical importance for communities within the proposed management unit or downstream of it, HCV presence is assumed in line with the precautionary approach. In other words, these critical areas shall be considered to be HCV 4 areas whether or not they have legal protection status.

²³Despite its name, the National Forestry Act 1984 applies only to Peninsular Malaysia

²⁴As the NPP is periodically updated, the latest version available should be used

Pollination

According to an assessment by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2017), 75% of food crops and nearly 90% of wild flowering plants globally depend at least to some extent on animal pollination. The assessment also found that the major threats to the survival of pollinators are land-use change (including habitat loss), intensive agricultural management and pesticide use, environmental pollution, invasive alien species, pathogens and climate change. Pollination is critical where there is a potential catastrophic effect from the loss or reduction of this ecosystem service on the production of subsistence crops and cash crops that local communities depend on for their livelihood. Examples of crops that are dependent on wild pollinators are the durian (*Durio zibethinus*) and petai (*Parkia speciosa*), both of which are pollinated by bats. In some areas in Malaysia, local communities may depend on the wild pollinators directly as a source of their livelihood, as in the case of honey harvested from the nests of wild honey bees and stingless bees.



A tualang tree harbouring nests of the giant honey bee

Credit: Proforest/Surin Suksuwan

The assessor should determine if there is any important nesting, roosting or feeding sites of pollinators within the management unit and surrounding landscape that maybe impacted by proposed activities in the management unit. Wild honey bees in Malaysia often build nests on large trees such as *Koompassia excelsa* (known as *tualang* in Peninsular Malaysia, *mengar* in Sabah and *tapang* in Sarawak). Fruit bats also roost on large trees, as in the case of *Pteropus* spp. (flying foxes), or in caves (*Eonycteris* spp.). The presence of significant populations of these key pollinators in the management unit or wider landscape is an indicator of HCV 4 presence.

3.4.2 Indicators and data sources

Indicators

Indicators of a potential HCV 4 include:

- Protection PRFs gazetted for soil and/or water protection under the National Forestry Act 1984 for Peninsular Malaysia and the Sabah Forestry Enactment 1984
- Water catchment areas gazetted under relevant state laws including (but not limited to) the Selangor Waters Management Authority (LUAS) Enactment 1999 (LUAS), the Johor Water Enactment 1921 Johor, the Sabah Water Resources Enactment 1998 and the Sarawak Water Ordinance 1994
- For Peninsular Malaysia, the presence of Environmentally Sensitive Areas (ESAs) as defined in the National Physical Plan, especially areas indicated as being within dam (reservoir) catchment areas for public drinking water supply, whether or not legally gazetted as such
- Results of available hydrological studies and analysis of topography and hydrological maps showing that a particular area is the catchment or watershed area of a local community water supply system, whether or not the area is gazetted as a protection forest

- Areas upstream of and important for maintaining the ecosystem health of extensive or important wetlands, fish nurseries and spawning grounds, or sensitive coastal ecosystems (e.g. mangrove forests, coral reefs etc.)
- Wetland and other areas important for regulating and supporting services related to water filtration, prevention of seawater intrusion, prevention of abrasion/coastal erosion and flood mitigation
- Steep or mountainous areas, or areas of high rainfall, where the risk of catastrophic erosion or landslides is high to people living in the surrounding area
- Areas identified in policy documents (e.g. the National Physical Plan) as critically important for soil and nutrient conservation
- Where there is naturally low soil fertility, especially on sandy, peaty or fragile soils, where land clearance, drainage, use of heavy machinery or other intensive land use might affect soil structure and fertility
- Key nesting/roosting/feeding sites for pollinators of crops critically important for subsistence or livelihoods of local communities or for the maintenance of RTE species and ecosystems e.g. Tualang/Mengaris/Tapang (*Koompassia excelsa*) trees for bees, and caves with roosting sites for bats.

Data sources

A list of data sources for assessing HCV 4 in Malaysia is provided in Annex 4.

In addition, data should also be gathered using the following methods, where applicable:

- Consultation with:
 - local authorities and government agencies
 - specialists such as geologists, soil scientists, ecologists, hydrologists etc.
 - local communities to determine their use and dependence on ecosystem services and potential environmental impacts from the proposed activity in the management unit
 - relevant organisations working on community development with the communities in question (or other similar communities in the area)
- Participatory community mapping
- GIS analysis involving remote sensing data sets and other data sources on location of critical ecosystem services such as watershed areas, steep slopes, vulnerable soils etc.
- Field observations and measurements (e.g. tree size, density, age classes) to assess canopy cover, forest quality, signs of human activities (resource extraction, localised forest clearance etc.), presence of roosting sites for key pollinators etc.

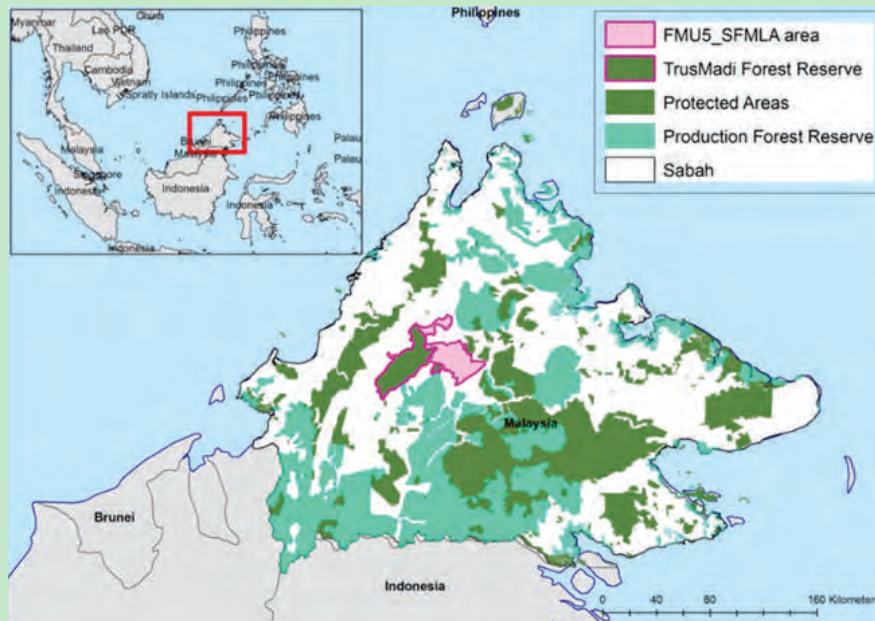
3.4.3 Case study

HCV 4 and 5 Case Study: Watersheds of gravity-fed water systems in Trusmadi Forest Reserve in Sabah

Location of case study: Trusmadi Forest Reserve, Ranau and Tongod districts, Sabah

Ecosystem: Mixed dipterocarp forests and lower montane forest.

Assessment context: HCV assessment for FSC or MTCS certification; also expected to undergo VCS and CCB certification for a carbon offset project.



Location of Trusmadi

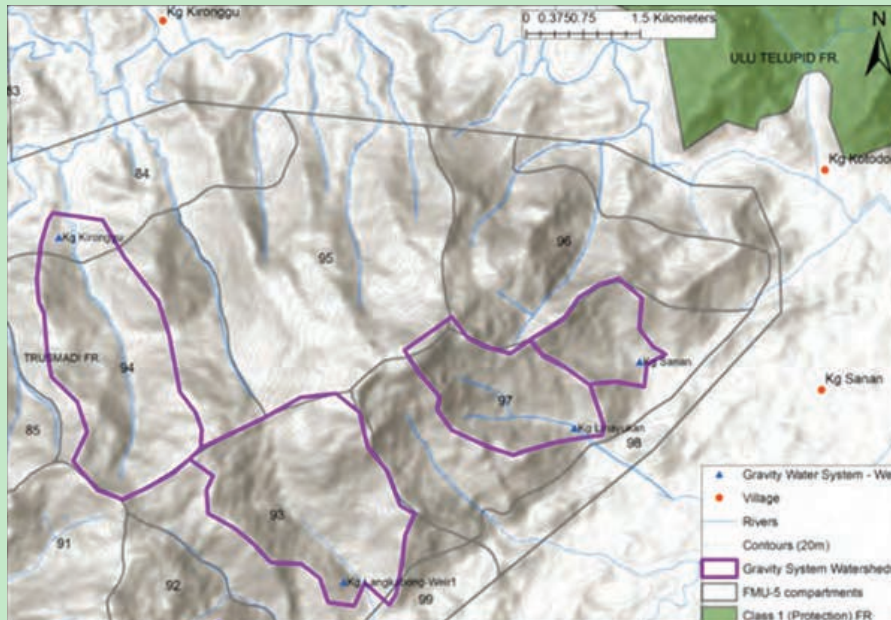
In Sabah, most rural communities in hilly, forested landscapes depend on Gravity Fed System (GFS) water supply for their drinking water needs. The GFS intake points are often located in the headwaters, on steep slopes with forest cover. Forests in the GFS watersheds are sometimes actively protected when located in protected areas or in community managed land. However, often they are unprotected but persist due to their location on steep slopes, rarely suitable for other land uses. In agricultural and forestry production frontiers, forest persistence in GFS watersheds is becoming increasingly precarious, thus threatening a crucial aspect of low-carbon living of rural communities.

Sabah has kept about half of the state's land area (or about 3.7 million ha) as 'permanent forest estate', allocated for forest protection and forestry production. Most of the production areas have been given on a 100-year sustainable forest management license agreement (SFMLA) to private companies. Production activities include logging and tree plantations, and to a small extent, oil palm plantations. The production activities of each SFMLA area is guided by a 10-year forest management plan that is subjected to approval and monitoring by the Sabah Forestry Department.

Out of the SFMLA licensed areas, 88,920 ha in Trusmadi Forest Reserve has been licensed to a company in 1997. The area receives 2,500-3,500 mm of annual rainfall, consists of mountainous terrain, and is well covered by forests, largely of the upland dipterocarp forest type. A new forest management plan was developed in 2017 with significant inputs from environmental NGOs.

To support the forest management planning, an HCV assessment focusing on watersheds of GFS water supply to local communities living in and around the licensed area was conducted by Forever Sabah. This SFMLA area is expected to undergo forest management certification under the FSC or MTCS standards. A carbon offset project is being developed in the area and it is also expected to undergo Verified Carbon Standards (VCS) and Climate, Community, and Biodiversity (CCB) certification.

A survey of the villages located in and around the licensed area was conducted in June 2017 to assess the dependence of local communities on GFS water supply and to collect geographical coordinates of the GFS weir/intake locations. 15 out of 19 surveyed villages were found to have GFS water supplied from the SFMLA area, and for most households, the GFS supply was the only source of drinking water. The GFS supply was thus identified as fundamental to meet the basic needs of the local communities and hence an HCV 5 value. The GFS weir locations and the watershed extents draining into each weir were mapped using topographical contour maps, drainage maps, and digital elevation model data available from NASA.



GFS watersheds in Trusmadi Forest Reserve

The mapped watersheds were then delineated as HCV Areas; a 100-m buffer was proposed around each watershed to make them HCV Management Areas (HCVMA). Since logging and tree plantation activities within these HCVMA will adversely impact the water quality due to soil erosion and sedimentation, Forever Sabah has made a management recommendation to protect the HCVMA from these disturbances. This would ensure that the SFMLA area maintains clean water provision to meet a basic need of the local human communities.

Text: Forever Sabah

3.5 Community Needs

Sites and resources **fundamental for satisfying the basic necessities** of local communities or indigenous peoples (for example for livelihoods, health, nutrition, water), **identified through engagement with these communities or indigenous peoples.**

3.5.1 Key terms and concepts

As explained in Table 2 (pg. 37) of the Common Guidance for Identification of HCVs, provisioning services contribute to human wellbeing and livelihoods (HCV 5). It is noted that there are significant overlaps between some regulating services e.g. water flow regulation and purification (HCV 4) and drinking water provision (HCV 5). Provisioning ecosystem services in the context of HCV 5 include food, freshwater, wood, fibre, fuel, medicine, fodder for livestock and non-fibre NTFPs (e.g. illipe nut, resin/dammar) needed for income generation.

Fundamental for satisfying basic necessities

A site or resource is fundamental for satisfying basic necessities if the services it provides are **irreplaceable** (i.e. if alternatives are not readily accessible or affordable), and if its loss or damage would cause suffering or prejudice to affected stakeholders. Basic necessities in the context of HCV 5 may cover any or all of the provisioning services of the environment including tangible materials that can be consumed, exchanged or used directly in manufacture, and which form the basis of daily life.

HCV 5 may occur where water supplies for rivers, streams and other natural water bodies are critical for human uses including drinking water, cooking, washing and irrigation and, fishing, and there are no viable or readily available alternatives.

Where there are natural resources being collected to fulfill basic human needs, and there are no viable or readily available alternatives, HCV 5 is likely to be present. These natural resources may be in the form of edible plants, wildlife, wood and other fibre and fuel.



A pristine stream located in the watershed of a public water supply system in Peninsular Malaysia
Credit: Surin Sukswan

Identified through engagement with...communities or indigenous peoples

Local communities and/or indigenous peoples should play a key role in proposing and identifying potential HCVs through a participative process. When evaluating sites and resources as HCV 5 it is necessary to consult widely and ensure that participatory mapping and social surveys include representatives from minority and vulnerable groups, including women. Local communities need to be involved in a consultative process and agree to decisions concerning the identification, management and monitoring of HCVs through a Free, Prior & Informed Consent (FPIC) process, including the requirements that consultation should be conducted with representatives appointed by the communities. This means that any decision or consent derived should be made without coercion or intimidation, with all relevant information provided and prior to commencement of any damaging activities or operations. In addition to local consultation, experts, local authorities and NGOs can provide helpful information and context.

Indigenous people (*Orang Asal*) and other local communities in rural areas throughout Malaysia deserve special attention. The basic necessities of many local communities are dependent on natural resources, including reliance on rivers for water consumption, and there is a heavy dependence on subsistence crops to meet nutritional requirements.

In the case of indigenous communities, there is a very strong attachment to customary land (and waters) from which many of their basic necessities are sourced. Some of the customary lands are recognised by the government while some are not.

Therefore, the HCV assessor should understand the concepts of common law and Native Customary Rights and take note of existing rights including user rights on natural resources or areas within the management unit. This is even more important, should the project proponent have legal ownership over the land area. Native Customary Claims should be identified prior to any development to avoid future conflicts or even legal cases.

It should be noted that within protected areas and forest reserves, hunting and most other forms of resource extraction is prohibited, although there may be exemptions made for certain indigenous communities.

There are various terms used for customary rights and are not limited to the following – *pemakai menoa* and *pulau galao* (natural community conserved area) in Sarawak, *kapanggor* (fallow land for traditional agricultural cycle), *pogun laid* (ancestral family homes and fruit trees) and *kalabanggan* (cemetery) in Sabah. The Orang Asli in Peninsular Malaysia have several specific terms for communal territory, including *tanah adat*, *wilayah adat*, *nenggirik* and *pesaka* depending on the ethnic group.

3.5.2 Indicators and data sources

Indicators of a potential HCV 5 include:



Fibres of the kercut or rumput purun (*Lepironia articulata*) collected from the forest swamps by local communities for making handicraft in Setiu Wetlands, Terengganu
Credit: Proforest/Surin Sukswan

- Local communities have or are claiming customary rights within the management unit or in the surrounding landscape
- Presence of Community Compartment in the SFMLA or the Community Compartment Area (CCA) in Sabah REDD+
- Remote and/or poor rural areas where people rely directly on rivers and streams for their water supply, transportation needs, and natural resources for their basic needs
- Access to health centres or hospitals is difficult
- Most houses are built from (not just the main structural material but also materials for roofing etc.) and household tools made from locally available traditional/natural materials

- There is little or no potable water, electricity and sanitation infrastructure
- Fire wood is used as the main source of cooking food
- People have limited opportunity to generate cash income (living “day-to-day”)
- Farming (food crops) and livestock raising are done on a small or subsistence scale or critical for generating income for acquiring basic necessities
- Indigenous hunter-gatherers including nomadic communities are present
- Shifting/swidden cultivation is still practised by the local communities
- Hunting and/or fishing is an important source of protein and income
- A wild food resource constitutes a significant part of the diet, either throughout the year or only during critical seasons
- There is a significant use of traditional medicine sourced from natural resources
- There is a significant reliance on NTFPs for livestock fodder
- There is a significant reliance on NTFPs for income generation such as Illipe nut (*engkabang*), resin (*damar*), wild honey, rattan, bamboo, *petai*, etc.

Data sources

A list of data sources for assessing HCV 5 in Malaysia is provided in Annex 5.

In addition, data should also be gathered using the following methods, where applicable:

- Consultation with:
 - relevant local authorities and government agencies
 - specialists such as sociologists, ethnobotanists, NTFP experts, etc.
 - local communities to determine their dependence on natural resources, and potential environmental impacts from the proposed activity in the management unit
 - relevant organisations working on community development with the communities in question (or other similar communities in the area)
- Participatory community mapping
- GIS analysis involving remote sensing data sets and other data sources e.g. on location of NTFP resources, location of community water collection points etc.
- Field observations of local community use of natural resources (hunting, fishing, harvesting of NTFPs) etc.

3.5.3 Case study

HCV 4, 5 & 6 Case Study: Lati'ba: Highland Wet Rice Cultivation

Location of case study: Bario of the Kelabit Highlands, Ba Kelalan along the Kelalan River, and Long Semado in northernmost part of Sarawak -

Ecosystem: Submontane forest



Location of the highland communities, Bario, Ba Kelalan and Long Semado, which practise lati'ba cultivation

The traditional lati'ba (highland wet rice cultivation) practice of the Kelabit and Lun Bawang of Sarawak, and Lundayeh of Sabah and North Kalimantan, encompasses more than one High Conservation Value.

Settlements in Bario of the Kelabit Highlands, Ba Kelalan along the Kelalan River (a tributary of the Batang Trusan); Long Semado and Long Lopeng along the Batang Trusan, Sarawak (WWF 2009); Long Pasia and Long Miou, Ulu Padas, Sabah; and those in the Krayan Highlands in North Kalimantan, are known for lati'ba' agriculture practices, which produce high quality black, red and white Adan rice (Padoch 1981; Langub 1984; Crain & Pearson-Rounds 1999).

Lati'ba is intricately bound to their lives (Padoch 1981; Langub 1984; Crain & Pearson-Rounds 1999) to the extent that the some Lundayeh communities were known as 'lun nan ba' or the people of the wet rice fields' (ed. Topp & Eghenter 2006:115). Permanent terraced lati'ba' fields surround their settlements and cover the gently sloping river flood plains and plateaus. Once established, the farmers, men and/or women, have an efficient agricultural system, and are generally ensured of ample harvest both for consumption and sale.

Location for fields is based on the flatness of the area, slope, availability of clear water (tea-coloured waters that are nutrient poor and acidic are avoided) and soil type (Padoch 1981; Crain & Pearson-Rounds 1999). The fields are not isolated from each and the farmers work together to develop them (Langub 1984). The distribution of clean, clear water, which contributes nutrient to the relatively infertile soils, is the key to the system's success (ed. Topp & Eghenter 2006), may be linked or separate, depending on topography and source (Padoch 1981; Langub 1984).



A patchwork of harvested rice fields ready to be harvested in Ba Kelalan

The agricultural cycle begins after harvest. Water buffaloes, an economically-important commodity, are released into the fallow fields to graze. This contributes nutrients, works the soil, and helps to prepare the field for the next crop. Bunds surrounding each plot are repaired, and then water is released into the terraced fields (Padoch 1981; ed. Topp & Eghenter 2006) submerging the vegetation. Next, foot-high seedlings are transplanted. The fields are weeded when needed. In about six months the rice fields turn from a deep green to a golden yellow. The harvesting season can begin in late December in Long Semado, but this varies according to the place.

The success of the indigenous lati'ba, agriculture method is tied to the supply of high quality clean clear water (Padoch 1981; ed. Topp & Eghenter 2006) which originates from the forested mountains.

The HCVs linked to lati'ba are: HCV 4 because the forested area upstream of the rice cultivation is critical for the regulatory ecosystem service of water catchment protection; HCV 5 because the water supply of clean clear nutrient-filled water for rice cultivation is a provisioning ecosystem service; and HCV 6 because rice and lati'ba' itself are cultural values which are fundamental to the Kelabit, Lun Bawang and Lundayeh people.

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Text: Ann Armstrong, Malaysian Nature Society Kuching Branch

Photo: Noboru Ishikaya

3.6 HCV 6 Cultural values

Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

3.6.1 Key terms and concepts

The definition of HCV 6 is extremely broad and it is useful to divide it into two different categories: cultural values of global or national significance, and values critical for local people at the site scale.

Values of global or national...significance

Sites, resources, habitats or landscapes which are significant at the global or national level are likely to have widely recognised historical, religious or spiritual importance and in many cases will have an official designation by national government (i.e. gazetted/proposed as a National Heritage Site under the National Heritage Act) or an international agency such as UNESCO (see Box 14, pg. 48 in the Common Guidance for Identification of HCVs). Occasionally, new sites or resources of extraordinary cultural significance may be discovered through exploration of sites for development (e.g. ancient burial sites or prehistoric cave art); these can qualify as HCV 6 based on expert and stakeholder opinion, without an official designation.

Critical importance for the traditional cultures of local communities or indigenous peoples

HCV 6 represents areas of cultural significance that have traditional importance to local or indigenous people. These may be religious or sacred sites, burial grounds, megaliths, geological sites/formations, resources needed for making traditional tools and cultural items, sacred trees, or sites at which traditional ceremonies take place. These are frequently well known by the local people, and some federal or state laws require them to be identified and protected. Assessors should take note of all cultural features (of local significance whether or not they are known/recognised by relevant authorities).



Carey Island Mah Meri woodcarver
Credit: Surin Sukswan

In the Malaysian context, HCV 6 also encompasses traditional cultures of local communities or indigenous peoples (as acknowledged by relevant authorities), identified through engagement with these local communities or indigenous peoples. The customary landscape features of indigenous communities are localised and site-specific, and often form the basis of the community's subsistence, spirituality, culture, history and identity.

3.6.2 Indicators and data sources

Indicators

Indicators of a potential HCV 6 include:

- Presence of inscribed/proposed World Heritage, National Heritage or State Heritage sites.
- Presence of megaliths, religious or sacred sites, burial grounds, geological sites/formations, resources needed for making traditional tools and cultural items, sacred trees, or sites where traditional ceremonies or historical events take place
- Local communities have or are claiming customary rights within the management unit or in the surrounding landscape
- Presence of shifting cultivation
- Strong traditional practices being retained by local communities.

Note to assessors: All claims need to be established through an FPIC process. The authenticity of cultural sites identified should be verified by the cultural authorities of local communities, or government directives concerning archaeological/cultural sites and resources etc.

Data sources

A list of data sources for assessing HCV 6 in Malaysia is provided in Annex 6.

In addition, data should also be gathered using the following methods, where applicable:

- Consultation with:
 - anthropologists, historians, archaeologists, cultural experts, museum authorities and other relevant government agencies on the presence of cultural values in the management unit and surrounding landscape
 - local communities to determine the presence and location of cultural values and potential environmental impacts from the proposed activity in the management unit
 - relevant organisations working on community development with the communities in question (or other similar communities in the area)
- Participatory community mapping
- GIS mapping of cultural values
- Field observations of traditional practices, cultural sites, etc.

3.6.3 Case study

HCV 6 case study: *Tagal* : A community-based tradition for fish stock conservation

Location of Case Study: Upper Moyog River, Sabah

Ecosystem: River ecosystem



The batu sumpah tagal (oath stone) is normally placed near the tagal site to remind the locals and visitors to adhere to the cultural practice



Many indigenous societies have a strong cultural bond with the local streams and rivers

The indigenous people of Sabah have a tradition of conserving fish stock in the rivers at various degrees. The traditional practice is known as *tagal* or *bombon*, depending on dialects used in various localities. In principle, a certain stretch of the river may be designated as *tagal* with the agreement of more than 50% of local residents and the consensus is formally registered with the Sabah Fisheries Department. A river which is under the *tagal* practice is divided into three zones, namely 1) red zone where any form of fishing is prohibited, 2) yellow zone where fishing is only allowed periodically, and 3) green zone where controlled fishing is allowed throughout the year. Typically, a working committee is responsible of managing the *tagal* zones, organising the *buka tagal* (a one-day communal fishing event) in the yellow zone and to act against perpetrators. At the time of writing, there are more than 500 registered *tagal* areas in Sabah and the Sabah Fisheries Department is expected to assist more riverine communities to deploy the *tagal* practice in line with the aspiration of the National Agrofood Policy 2020.

In the context of HCV designation, one question that needs to be asked, however, is – should communal areas where tagal are practised be classified as HCV 5 or HCV 6? Unlike HCV 5 resources (such as water), *tagal* areas are not critical for the basic necessity of local communities. In modern times, most rural communities have other food sources, and these may be procured from the local grocery stores and *tamu* (fresh market). Fish from *tagal* sites are normally regarded as supplementary food sources. Nonetheless, the *tagal* practice is an inherent part of the local indigenous culture. Any negative impacts from the development area to the waterbodies where tagal is practised will affect the local culture significantly. Therefore, the *tagal* practice itself should be classified as a HCV 6 and the relevant zones as HCV 6 areas, while riparian areas needed to maintain the value should be classified as HCVMA areas.

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Text and photos: Casey Ng, Forever Sabah

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ANNEXES

Annex 1: List of data sources for HCV 1

Reference	Availability	Application
Legislation*		
Protected area laws as listed in the Master List of Protected Areas in Malaysia	<p>The Master List of Protected Areas in Malaysia should be available on the MyBIS website once approved: www.mybis.gov.my</p> <p>In the meantime, there is draft interim version of the Protected Area Master List which may be available on request from the Ministry of Natural Resources and Environment. Tel: +603 8861129</p> <p>A finalised version of the Protected Area Master List is expected to be published in 2018.</p>	Malaysia
International Trade in Endangered Species Act 2008 Malaysia (INTESA)	<p>Available for download from: https://www.mybis.gov.my/pd/109</p> <p>and</p> <p>https://en.wikipedia.org/wiki/International_Trade_in_Endangered_Species_Act_2008</p>	Malaysia
National Forestry Act 1984	<p>Available for download from: https://www.forestry.gov.my/index.php/en/akta_perhutanan_negara_1984</p>	Peninsular Malaysia
National Land Code 1965	<p>Available for download from: http://www.kptg.gov.my/sites/default/files/article/NLC1956DIGITAL_VER1.pdf</p>	Peninsular Malaysia
Wildlife Conservation Act 2010	<p>Download available from: https://www.mybis.gov.my/pb/675</p> <p>Incorporating lists of protected and totally protected animals in Peninsular Malaysia</p>	Peninsular Malaysia
Forests Enactment 1968	<p>Available for download from: http://www.lawnet.sabah.gov.my/lawnet/sabahlaws/StateLaws/ForestEnactment1968.pdf</p>	Sabah
Land Ordinance (Sabah Cap. 68)	<p>Available for download from: http://ww2.sabah.gov.my/phb/wp-content/uploads/2011/05/LandOrdinance.pdf</p> <p>and</p> <p>https://www.sabahlaw.com/landord.htm</p> <p>Incorporating the Land (Amendment) Enactment 2012</p>	Sabah
Sabah Biodiversity Enactment 2000	<p>Available for download available from: http://www.sabc.sabah.gov.my/?q=content/legislations</p>	Sabah
Wildlife Conservation Enactment 1997	<p>Available for download available from: https://www.sabahlaw.com/</p>	Sabah

Forests Ordinance 2015	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Natural Resources and Environment Ordinance 1958	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Sarawak Biodiversity Centre Ordinance 1997	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Sarawak Land Code 1958	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Wild Life Protection Ordinance 1998	Available for download from: http://lawnet.sarawak.gov.my Incorporating lists of totally protected and protected animals and plants in Sarawak.	Sarawak
Policy Documents		
NRE. 2016. <i>National Policy on Biological Diversity 2016-2025</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/590	Malaysia
NRE. 2014. <i>Draft Interim Master List of Protected Areas in Malaysia – A Tool for National Biodiversity Conservation Management and Planning</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available on request from the Ministry of Natural Resources and Environment. Tel: +603 8861129 A partial dataset is available in an interactive map of protected areas on the MyBIS portal: https://www.mybis.gov.my/one/pamaps.php	Malaysia
NRE. 2008. <i>A Common Vision on Biodiversity: In government and the development process – Reference document for planners, decision-makers & practitioners</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	A finalised version of the Protected Area Master List is expected to be published in 2018. Download available from: http://www.nre.gov.my/ms-my/PustakaMedia/Penerbitan/A%20Common%20Vision%20on%20Biodiversity.pdf	Malaysia
Saw, L.G., L.S. L. Chua & A.R. Nik. (eds.). 2009. <i>Malaysia National Strategy for Plant Conservation</i> . Ministry of Natural Resources and Environment & Forest Research Institute Malaysia (FRIM), Putrajaya, Malaysia.	Available for online viewing at: https://www.mybis.gov.my/pb/26	Malaysia

<p>Chua, L.S.L., M. Suhaida, M. Hamidah & L.G. Saw. 2010. Malaysia Plant Red List: Peninsular Malaysian Dipterocarpaceae. FRIM Research Pamphlet No. 129. Forest Research Institute Malaysia (FRIM), Selangor and the Ministry of Natural Resources & Environment (NRE), Putrajaya.</p>	<p>Online version: https://www.mybis.gov.my/pb/15</p>	<p>Peninsular Malaysia</p>
<p>DTCP. 2014. <i>National Physical Plan-2 (NPP-2)</i>. Department of Town and Country Planning, Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.</p>	<p>Available from: Department of Town and Country Planning, Peninsular Malaysia. Contac Tel: +603-2264 6004 Available for download from: https://www.townplan.gov.my/publication.php</p>	<p>Peninsular Malaysia</p>
<p>DTCP. 2012. <i>National Coastal Zone Physical Plan (NPP-CZ) Vols. 1 & 2</i>. Department of Town and Country Planning, Peninsular Malaysia (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.</p>	<p>Available from DTCP: Contact: Tel: +603-2264 6004 Fax: +603-2273 9680 Bahasa Malaysia version available for download from: https://www.townplan.gov.my/publication.php Includes KSASSP i.e. Kawasan Sensitif Alam Sekitar Persekitaran Pantai (Coastal Zone Environmentally Sensitive Areas)</p>	<p>Peninsular Malaysia</p>
<p>DTCP. 2009. <i>Central Forest Spine 1: Master Plan for Ecological Linkages</i>. Department of Town and Country Planning (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.</p>	<p>Available for download from: https://www.townplan.gov.my/publication.php</p>	<p>Peninsular Malaysia</p>
<p>DTCP. 2009. <i>Central Forest Spine 2: Master Plan for ecological linkages</i>. Department of Town and Country Planning, Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.</p>	<p>Available for download from: https://www.townplan.gov.my/publication.php</p>	<p>Peninsular Malaysia</p>
<p>DWNP. 2017. <i>Red list of Mammals for Peninsular Malaysia</i> Version 2.0. Department of Wildlife and National Parks (DWNP), Kuala Lumpur, Malaysia.</p> <p>However, at the time of writing, this version is not yet available online. The earlier version of the red list is available:</p> <p>DWNP. 2010. <i>Red List of Mammals for Peninsular Malaysia</i>. Department of Wildlife and National Parks Kuala Lumpur, Malaysia</p>	<p>Available for download from: http://www.wildlife.gov.my/index.php/penerbitan/111-lain-lain</p> <p>https://www.mybis.gov.my/pb/29</p>	<p>Peninsular Malaysia</p>

DWNP. 2013. National Elephant Conservation Action Plan (NECAP): Blueprint to save Malaysian elephants. Department of Wildlife & National Parks Peninsular Malaysia, Kuala Lumpur, Malaysia.	Available for download from: http://www.wildlife.gov.my/images/stories/penerbitan/pelan/NECAP%20all.pdf	Peninsular Malaysia
DWNP. 2008. <i>National Tiger Conservation Action Plan</i> (NTCAP) 2008-2020. Department of Wildlife & National Parks, Kuala Lumpur, Malaysia.	Available for download from: http://www.wildlife.gov.my/index.php/penerbitan/107-pelan	Peninsular Malaysia
Ambu, L.N., P.M. Andau, S. Nathan, A. Tuuga, S.M. Jensen, R. Cox, R. Alfred, J. Payne. Undated. <i>Asian Elephant Action Plan Sabah</i> (Malaysia). Sabah Wildlife Department.	Available for download from: http://www.wildlife.sabah.gov.my/?q=en/download	Sabah
Sabah Wildlife Department. Undated. <i>Crocodile Management Plan (Sabah)</i> . Sabah Wildlife Department, Kinabalu, Sabah.	Available for download from: http://www.wildlife.sabah.gov.my/?q=en/download	Sabah
Chief Conservator of Forests Circular: CF17/2017	Mempening (<i>Lithocarpus</i> spp.) and berangan (chestnuts) (<i>Castanopsis</i> spp.) are prohibited species in forest reserves under natural forest management regime effective 1.6.2017 due to their scarcity and being species good for wildlife in Sabah	Sabah
Schedule B – Clause 1(31) of Sustainable Forest Management Licence Agreement (SFMLA)	List of tree species that forest concessionaires are prohibited to fell under the SFMLA	Sabah
Sabah Forestry Department. 2009. <i>RIL Operation Guide Book: Code of Practice for Forest Harvesting in Sabah, Malaysia (Third Edition)</i> . Sabah Forestry Department, Sabah, Malaysia.	Available for download from: http://www.deramakot.sabah.gov.my/Unpublished.html	Sabah
Sabah Wildlife Department. Undated. <i>Sabah Orangutan Action Plan</i> . Sabah Wildlife Department, Kota Kinabalu, Sabah.	Available for download from: http://www.wildlife.sabah.gov-my/?q=en/download	Sabah
Sabah Wildlife Department. 2011. Sabah Rhinoceros Action Plan 2012-2016. Sabah Wildlife Department, Kota Kinabalu, Sabah.	Available for download from: http://www.wildlife.sabah.gov-my/?q=en/download	Sabah
Wildlife Conservation Society (WCS) and Sarawak Forest Department. 1996. <i>A masterplan for wildlife in Sarawak</i> . Sarawak Forest Department, Kuching, Malaysia.	For enquiries or to obtain a copy, contact the Sarawak Forestry Department at: http://www.forestry.sarawak.gov.my/	Sarawak

Papers/reports/books		
MNS Bird Conservation Council. 2015. <i>A checklist of birds of Malaysia</i> 2nd edition. MNS Conservation Publication no. 14. Malaysian Nature Society (MNS), Kuala Lumpur, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/645	Malaysia
Ng, F.S.P., C.M. Low & N.S. Mat Asri. 1990. Endemic trees of the Malay Peninsula. <i>Research Pamphlet No. 106</i> . Forest Research Institute Malaysia, Kuala Lumpur, Malaysia.	Contact Forest Research Institute Malaysia (FRIM). Tel: +603 62797000 Website: https://www.frim.gov.my/en/contact-us/	Peninsular Malaysia
Saaban, S., N.B. Othman, M.N. Yasak, B.M. Nor, A. Zafir, & A. Campos-Arceiz. 2011. Current Status of Asian Elephants in Peninsular Malaysia. <i>Gajah</i> 35: 67-75.	Available for download from: http://www.asesg.org/PDFfiles/2012/35-67-Saaban.pdf	Peninsular Malaysia
Yeap, C. Y., A.C. Sebastian & G.W.H. Davison (eds.). 2007. Directory of Important Bird Areas in Malaysia: key sites for conservation. <i>MNS Conservation Publication 8</i> . Malaysian Nature Society, Kuala Lumpur.	Contact the Malaysian Nature Society: Email: mns@mns.org.my Tel: +603 22879422 Website: https://www.mns.my	Malaysia
Saw, L.G., L.S. Chua, M. Suhaida, W.S. Yong, A.M. Hamidah. 2010. Conservation of some rare and endangered plants from Peninsular Malaysia. <i>Kew Bulletin</i> 65(4): 681-689.	Available online at: https://www.jstor.org/stable/i23044552	Peninsular Malaysia
Suksuwan, S. & Siti Zuraidah Abidin. 2015. Taking stock: how are we doing at conserving our natural ecosystems and biodiversity heritage. In: UNDP & NRE. 2015. <i>Proceedings of the First National Protected Areas Managers' Conference</i> . United Nations Development Programme (UNDP) and Department of Wildlife and National Parks (DWNP), Kuala Lumpur, Malaysia.	Available for download from: http://www.protectedareasmalaysia.my/pamc-2014-proceedings-available/	Peninsular Malaysia
Wells, D.R. 1999. <i>The birds of the Thai-Malay Peninsula (Volume 1): Non-Passerines</i> . Academic Press, London, UK. Wells, D.R. 2007. <i>The birds of the Thai-Malay Peninsula (Volume 2): Passerines</i> . A&C Black, London, UK.	Contains information on the conservation status of birds of the Thai-Malay Peninsula based on the author's in-depth knowledge of Peninsular Malaysian birds.	Peninsular Malaysia
WWF. Undated. Borneo's new world – newly discovered species in the Heart of Borneo. WWF Malaysia, Sabah, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/1957	Sabah & Sarawak
Maycock, C.R., C.J. Kettle, E. Khoo, J.T. Pereira, J.B. Sugau, R. Nilus, R.C. Ong, N.A. Amaludin, M.F. Newman & D.F.R.P. Burslem. 2012. A revised conservation assessment of dipterocarps in Sabah. <i>Biotropica</i> 44: 649-657. Doi:10.1111/j.1744-7429.2011.00852.x	Online preview available and available for purchase at: http://onlinelibrary.wiley.com/doi/10.1111/j.1744-7429.2011.00852.x/abstract	

Web Resources		
Alliance for Zero Extinction (AZE)	http://www.zeroextinction.org/index.html The Alliance for Zero Extinction(AZE) engages non-governmental biodiversity conservation organisations working to prevent species extinctions by identifying and safeguarding the places where species evaluated to be Endangered or Critically Endangered under IUCN-World Conservation Union criteria are restricted to single remaining sites.	Malaysia
ASEAN Heritage Parks	https://environment.asean.org/asean-declaration-on-heritage-parks/	Malaysia
Biodiversity A-Z. United Nations Environment & World Conservation Monitoring Centre.	http://www.biodiversitya-z.org/content/important-plant-areas-ipa https://www.plantlife.org.uk/international/important-plant-areas-international Include a link for data and information on Important Plant Areas (IPAs) – a global web database programme by Plantlife International	Malaysia
Centres of Plant Diversity	http://www.biodiversitya-z.org/content/centres-of-plant-diversity-cpd	Malaysia
CITES Appendices I, II & III	https://www.cites.org/eng/app/appendices.php	Malaysia Malaysia
Global IUCN Red List of threatened species	http://www.iucnredlist.org	Malaysia
Important Bird and Biodiversity Areas (IBAs)	http://www.birdlife.org/datazone/country/malaysia	Malaysia
Key Biodiversity Areas	http://www.keybiodiversityareas.org	Malaysia
Malaysia Biodiversity Information System (MyBIS)	www.mybis.gov.my MyBIS is the clearing house for data on Malaysia’s biodiversity in line with the requirements on the Convention on Biological Diversity. The MyBIS portal includes searchable databases on animal, plant and fungal species as well as protected areas. The database on protected areas includes an interactive map of protected areas: https://www.mybis.gov.my/one/pamaps.php This dataset is incomplete at the time of writing but is expected to be updated from time to time.	Malaysia
Ramsar sites: list of wetlands of international importance	https://www.ramsar.org/wetland/malaysia	Malaysia
UNESCO Man and Biosphere Reserves	http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/asia-and-the-pacific/	Malaysia
UNESCO World Heritage Sites	http://whc.unesco.org/en/statesparties/my	Malaysia

Other Data Sources		
Reports from national and state forest inventories	Comprehensive forest inventories are conducted at periodic intervals (usually once every 10 years) at the national and state levels by the Forestry Department Peninsular Malaysia and respective state forestry departments. The outputs from these inventories are not publicly available but may be requested from the relevant agencies.	Malaysia
Species information sheets by Department of Wildlife & National Parks, Peninsular Malaysia.	Available for download from: http://www.wildlife.gov.my/index.php/ms/penerbitan/101-kertas-maklumat	Peninsular Malaysia
Protected wildlife species in Sabah – factsheet by Sabah Wildlife Department.	http://www.wildlife.sabah.gov.my/?q=en/_content/protected-species A fact-sheet of 10 protected species in Sabah.	Malaysia

*Note: only the parent legislation is listed as each act/enactment/ordinance may have numerous subsidiary legislation (rules/orders/regulations/schedules etc.) and also amendments.

Annex 2: List of data sources for HCV 2

Reference	Availability	Application
Legislation*		
National Forestry Act 1984	Available for download from: https://www.forestry.gov.my/index.php/en/akta-perhutanan-negara-1984	Peninsular Malaysia
National Land Code 1965	Available for download from: http://www.kptg.gov.my/sites/default/files/article/NLC1956DIGITAL-VER1.pdf	Peninsular Malaysia
Wildlife Conservation Act 2010	Available for download from: https://www.mybis.gov.my/pb/675	Peninsular Malaysia
Forests Enactment 1968	Available for download from: http://www.lawnet.sabah.gov.my/lawnet/sabahlaws/StateLaws/ForestEnactment1968.pdf	Sabah
Wildlife Conservation Enactment 1997	Available for download available from: https://www.sabahlaw.com/Wildliferegulation.htm	Sabah
Forests Ordinance 2015	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Wild Life Protection Ordinance 1998	Available for download from: http://www.forestry.sarawak.gov.my/upload/-file_folder/Policy	Sarawak
Policy documents		
NRE. 2016. <i>National Policy on Biological Diversity 2016-2025</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/590	Malaysia
DTCP. 2017. <i>National Physical Plan 3 (NPP-3)</i> . Department of Town and Country Planning, Peninsular Malaysia (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from: Department of Town and Country Planning, Peninsular Malaysia Contact Tel: +603-2264 6033 Available for download from: http://www.townplan.gov.my/publication.php?cat=17	Peninsular Malaysia
DTCP. 2014. <i>National Physical Plan-2 (NPP-2)</i> . Department of Town and Country Planning, Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from: Department of Town and Country Planning, Peninsular Malaysia. Tel: +603-2264 6004 Available for download from: http://www.townplan.gov.my/publication.php?cat=17	Peninsular Malaysia
DTCP. 2012. <i>National Coastal Zone Physical Plan (NPP-CZ) Vols. 1 & 2</i> . Department of Town and Country Planning, Peninsular Malaysia (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from DTCP: Contact: Tel: +603-2264 6004 Fax: +603-2273 9680 Bahasa Malaysia version available for download from: http://www.townplan.gov.my/publication.php?cat=9 Includes KSASSP i.e. Kawasan Sensitif Alam Sekitar Persekitaran Pantai (Coastal Zone Environmentally Sensitive Areas)	Peninsular Malaysia

<p>DTCP. 2009. <i>Central Forest Spine 1: Master Plan for ecological linkages</i>. Department of Town and Country Planning (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.</p>	<p>Available for download from: https://www.townplan.gov.my/publication.php?cat=9</p>	<p>Peninsular Malaysia</p>
<p>DTCP. 2009. <i>Central Forest Spine 2: Master Plan for ecological linkages</i>. Department of Town and Country Planning, Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.</p>	<p>Available for download from: https://www.townplan.gov.my/publication.php?cat=9</p>	<p>Peninsular Malaysia</p>
<p>Yayasan Sabah. 2014. <i>Imbak Canyon Conservation Area: Strategic Management Plan 2014-2023</i>. Yayasan Sabah, Sabah, Malaysia.</p>	<p>Contact: Conservation and Environmental Management Division Yayasan Sabah Group 12th Floor, Menara Tun Mustapha P.O. Box 11622, 88817 Kota Kinabalu Sabah, Malaysia. Tel: (6088) 326314/326320 Fax: (6088) 326316/326315 E-mail: yscemd@gmail.com</p> <p>Manager Imbak Canyon Conservation Area Conservation and Environmental Management Division c/o Rakyat Berjaya Sdn. Bhd. Jalan Sekolah Cheng Min P.O. Box 1437, 90715 Sandakan Sabah, MALAYSIA. Tel: (6089) 210852 / 225836 Fax: (6089) 210852</p>	<p>Sabah</p>
<p>Yayasan Sabah. 2014. <i>Maliau Basin Conservation Area: Strategic Management Plan 2014-2023</i>. Yayasan Sabah, Sabah, Malaysia.</p>	<p>Available for download from: https://maliubasin.net/documents/</p> <p>See also contact details above for Yayasan Sabah.</p>	<p>Sabah</p>
<p>Papers/reports/books</p>		
<p>WWF. 2017. <i>The environmental status of Borneo 2016</i>. Heart of Borneo Programme, Jakarta and Kuala Lumpur, Indonesia and Malaysia.</p>	<p>Available for download from: http://wwf.panda.org/knowledge_hub/where_we_work/borneo_forests/resources/</p> <p>A report on the whole of Borneo with reference and comparison to the Heart of Borneo area. Includes numerous maps of historical and current (2015) forest ecosystem types, fauna and flora species including endemic trees, timber concessions and expansion of oil palm and other plantations in Borneo. Available in low and high resolution versions.</p>	<p>Sabah & Sarawak</p>

WWF. 2017. <i>Updates on Heart of Borneo Programme</i> .	Available for download from: http://wwf.panda.org/knowledge_hub/where_we_work/borneo_forests/resources/	Sabah and Sarawak
“WWF Germany. 2005. <i>Borneo: Treasure island at risk: Status of forests, wildlife and related threats on the island of Borneo</i> . WWF Germany, Frankfurt, Germany.”	Includes the six WWF Priority Landscapes with the protected areas of Sabah, Sarawak and Kalimantan in Borneo and the protection of priority areas and species. Available for download from: http://wwf.panda.org/?21037%2FReport-Borneo-Treasure-Island-at-Risk Maps on the status of forests, wildlife and related threats on the Island of Borneo, including Sabah and Sarawak	Sabah & Sarawak
Martin R.A., S. Kumaran & R.B. Tuzan. 2015. Pilot Malaysia-EU REDD+ projects in Sabah: Tackling climate change through sustainable forest management and community development. In: <i>Proceedings of the 17th Malaysian Forestry Conference: “A century of forest management: Lessons learnt & the way forward”</i> . 11-12 November, 2014. Sabah Forestry Department, Kota Kinabalu, Malaysia.	Download available from: http://www.forest.sabah.gov.my/publication/proceedings-materials/513-proceedings-of-the-17th-malaysian-forestry-conference-a-century-of-forest-management-lessons-learnt-the-way-forward Contains information related to Kinabalu Ecolinc (ECOLINC) and Kinabatangan Corridor of Life (K-COL) projects.	Sabah
Maycock, C.R., C.J. Kettle, E. Khoo, J.T. Pereira, J.B. Sugau, R. Nilus, R.C. Ong, N.A. Amaludin, M.F. Newman & D.F.R.P. Burslem. 2012. A revised conservation assessment of dipterocarps in Sabah. <i>Biotropica</i> 44: 649-657. Doi:10.1111/j.1744-7429.2011.00852.x	Online preview available and available for purchase at: http://onlinelibrary.wiley.com/doi/10.1111/j.1744-7429.2011.00852.x/abstract	
Sabah Forestry Department. 2010. Compilation of presentations – Regional forum on “ <i>Enhancing Forest Ecosystems Connectivity and Corridors within the Heart of Borneo in Sabah</i> ”. 26-29 October 2009. Kota Kinabalu, Malaysia.	Available for download from: http://www.forest.sabah.gov.my/pdf/Regional-Forum2009.pdf	Sabah
Web Resources		
Global Forest Watch Malaysia	http://www.globalforestwatch.org/	Malaysia
Intact Forest Landscape (IFL)	http://www.intactforests.org/world.map.html	Malaysia

*Note: only the parent legislation is listed as each act/enactment/ordinance may have numerous subsidiary legislation (rules/orders/regulations/schedules etc.) and also amendments.

Annex 3: List of data sources for HCV 3

Reference	Availability	Application
Legislation*		
Protected area laws as listed in the Master List of Protected Areas in Malaysia	<p>The Master List of Protected Areas in Malaysia should be available on the MyBIS website once approved:</p> <p>https://www.mybis.gov.my</p> <p>In the meantime, there is draft interim version of the Protected Area Master List which may be available on request from the Ministry of Natural Resources and Environment. Tel: +603 8861129</p> <p>A partial dataset is available in an interactive map of protected areas on the MyBIS portal:</p> <p>https://www.mybis.gov.my/one/pamaps.php</p> <p>A finalised version of the Protected Area Master List is expected to be published in 2018.</p>	Peninsular Malaysia
Policy documents		
NRE. 2016. <i>National Policy on Biological Diversity 2016-2025</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/590	Malaysia
DTCP. 2017. <i>National Physical Plan 3 (NPP-3)</i> . Department of Town and Country Planning, Peninsular Malaysia (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from: Department of Town and Country Planning, Peninsular Malaysia Tel: +603-2264 6033	Peninsular Malaysia
DTCP. 2014. <i>National Physical Plan-2 (NPP-2)</i> . Department of Town and Country Planning, Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available for download from: http://www.townplan.gov.my/publication.php?cat=17 Available from: Department of Town and Country Planning, Peninsular Malaysia. Tel: +603-2264 6004 Available for download from: http://www.townplan.gov.my/publication.php?cat=17	Peninsular Malaysia
DTCP. 2012. <i>National Coastal Zone Physical Plan (NPP-CZ) Vols. 1 & 2</i> . Department of Town and Country Planning, Peninsular Malaysia (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from DTCP: Contact: Tel: +603-2264 6004 Fax: +603-2273 9680 Bahasa Malaysia version available for download from: http://www.townplan.gov.my/publication.php?cat=9 Includes KSASSP i.e. <i>Kawasan Sensitif Alam Sekitar Persekitaran Pantai</i> (Coastal Zone Environmentally Sensitive Areas)	Peninsular Malaysia
NRE. 2011. <i>National Action Plan for Peatlands</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: http://www.nre.gov.my/ms-my/PustakaMedia/Penerbitan/National%20Action%20Plan%20for%20Peatlands.pdf	Malaysia

Paper/Reports/books		
Bland, L.M., D.A. Keith, R.M. Miller, N.J. Murray, N.J. & J.P. Rodriguez (eds.). 2017. <i>Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria, Version 1.1.</i> IUCN, Gland, Switzerland.	Available for download available from: https://www.iucn.org/sites/dev/files/content/documents/rle_guidelines_draft_dec_2015.pdf	Peninsular Malaysia
DWNP. 2004. <i>Using an ecological model to assess the performance of a protected areas system at conserving biodiversity at the ecosystems level. Review of biodiversity in protected areas in Peninsular Malaysia.</i> A report prepared by the Malaysian Environmental Consultants (MEC) for Department of Wildlife and National Parks (DWNP), Kuala Lumpur, Malaysia.	Contact: Jabatan Perlindungan Hidupan Liar dan Taman Negara (PERHILITAN) Semenanjung Malaysia/ Department of Wildlife and National Parks (DWNP) Km 10, Jalan Cheras 56100 Kuala Lumpur Tel : 03-90866800 Fax : 03-90752873 Email: webmaster@wildlife.gov.my Website: http://www.wildlife.gov.my	Peninsular Malaysia
Kiew, R., R.C.K. Chung, L.G. Saw, E. Soepadmo & P.C. Boyce (eds.). 2010. <i>Flora of Peninsular Malaysia Series II: Seed Plants, Vol. 1. Malayan Forest Records no. 49(1).</i> Forest Research Institute Malaysia (FRIM).	Available for purchase from Forest Research Institute Malaysia at: Tel: +603-6279 7489/91, Fax: +603-6273 1076 E-mail: FRIM_Publications@frim.gov.my Website: http://www.chm.frim.gov.my Includes a description of the vegetation/ecosystem types in Peninsular Malaysia.	Peninsular Malaysia
<i>Malaysian Wetland Working Group. 1987. Malaysia Wetland Directory.</i> Department of Wildlife and National Parks, Kuala Lumpur, Malaysia.	Out of print. Available at the PERHILITAN library: Jabatan Perlindungan Hidupan Liar dan Taman Negara (PERHILITAN) Semenanjung Malaysia/Department of Wildlife and National Parks (DWNP) Km 10, Jalan Cheras 56100 Kuala Lumpur Tel : 03-90866800 Fax : 03-90752873 Email: webmaster@wildlife.gov.my Website: http://www.wildlife.gov.my	Malaysia
Soepadmo, E. & K.M. Wong (eds.). 1995. <i>Tree Flora of Sabah and Sarawak Vol.1.</i> Sabah Forestry Department, Forest Research Institute Malaysia & Sarawak Forestry Department, Malaysia.	Available for online viewing at: https://www.mybis.gov.my/pb/83 A photo-copied version in PDF can be downloaded from: http://www.itto.int/files/user/pdf/publications/PD186%2091/pd%20186-91-1%20rev%201%20(F).pdf Includes a description of ecosystem/vegetation types in Sabah and Sarawak.	Sabah and Sarawak
Suksuwan, S. & Siti Zuraidah Abidin. 2015. Taking stock: how are we doing at conserving our natural ecosystems and biodiversity heritage. In: UNDP & NRE. 2015. <i>Proceedings of the First National Protected Areas Managers' Conference.</i> United Nations Development Programme (UNDP) and Department of Wildlife and National Parks (DWNP), Kuala Lumpur, Malaysia.	Available for download from: http://www.protectedareasmalaysia.my/pamc-2014-proceedings-available/	Peninsular Malaysia

Symington, C.F., Revised by P.S. Ashton & S. Appanah. 2004. <i>Foresters Manual of Dipterocarps - Malayan Forest Record vol. 16</i> , Forest Research Institute Malaysia & Malayan Nature Society, Kuala Lumpur, Malaysia.	Available for purchase from: Forest Research Institute Malaysia Tel: +603-6279 7489/91, Fax: +603-6273 1076 https://www.frim.gov.my/ Includes a description of forest formations/vegetation types in Peninsular Malaysia.	Peninsular Malaysia
Wyatt-Smith, J. & B.A. Mitchell. 1995. <i>Manual of Malayan Silviculture for Inland Forest Vols. 1 & 2, Malayan Forest Records No. 23</i> . (2nd edition by Wyatt-Smith, J. & W.P. Panton). Forest Research Institute Malaysia (FRIM), Kuala Lumpur, Malaysia.	Out of print. Available at the FRIM library: Forest Research Institute Malaysia (FRIM), 52109 Kepong, Selangor Darul Ehsan, Malaysia Tel.: +603-62797532 https://www.frim.gov.my/en/services/library/ Contains a description of the major vegetation types found in Peninsular Malaysia.”	Peninsular Malaysia
Web resources		
Key Biodiversity Areas	https://www.iucn.org/resources/conservation-tools/world-database-on-key-biodiversity-areas	Malaysia
Malaysia Biodiversity Information System (MyBIS)	https://www.mybis.gov.my/one/ MyBIS is the clearing house for data on Malaysia’s biodiversity in line with the requirements on the Convention on Biological Diversity. The MyBIS portal includes searchable databases on animal, plant and fungal species as well as protected areas. The database on protected areas includes an interactive map of protected areas: https://www.mybis.gov.my/one/pamaps.php	Malaysia
Ramsar sites: list of wetlands of international importance in Malaysia	This dataset is incomplete at the time of writing but is expected to be updated from time to time. Information on Ramsar-designated wetlands in Malaysia may be obtained from: https://rsis Ramsar.org/	Malaysia
Other data sources		
Reports from national and state forest inventories	Comprehensive forest inventories are conducted at periodic intervals (usually once every 10 years) at the national and state levels by the Forestry Department Peninsular Malaysia and respective state forestry departments. The outputs from these inventories are not publicly available but maybe requested from the relevant agencies.	Malaysia

*Note: only the parent legislation is listed as each act/enactment/ordinance may have numerous subsidiary legislation (rules/orders/regulations/schedules etc.) and also amendments.

Annex 4: List of data sources for HCV 4

Reference	Availability	Application
Legislation*		
Environmental Quality Act 1974	Available for download from: https://www.doe.gov.my/portalv1/en/tentang-jas/perundangan/akta-kaedah-peraturan-arahan-2/akta	Peninsular Malaysia
Land Conservation Act 1960	Available for download from: http://pintu.instun.gov.my/artikel/papar/land-conservation-act-1960	Peninsular Malaysia
National Forestry Act 1984	Available for download from: http://www.chm.frim.gov.my/getattachment/b3ef13c6-7e18-4fc8-b5b8-d2b3c008c6c4/National-Forestry-Act-313-1-.pdf.aspx	Peninsular Malaysia
National Land Code 1965	Available for download from: http://www.kptg.gov.my/sites/default/files/article/NLC1956DIGITAL-VER1.pdf	Peninsular Malaysia
Environment Protection Enactment 2002	Available for download from: http://ww2.sabah.gov.my/jpas/laws/EPE/EPE02.pdf	Sabah
Forest Enactment 1968	Available for download from: http://www.lawnet.sabah.gov.my/lawnet/sabahlaws/StateLaws/ForestEnactment1968.pdf	Sabah
Land Ordinance (Sabah Cap. 68)	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws.aspx	Sabah
Sabah Water Resources Enactment 1998	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws.aspx	Sabah
Forests Ordinance 2015	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Natural Resources and Environment Ordinance 1958	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Sarawak Land Code 1958	Available for download from: https://pengayau.files.wordpress.com/2012/04/sarawak-land-code-chapter-81-tmp.pdf	Sarawak
Sarawak Rivers Ordinance 1993	Available for download from: http://lawnet.sarawak.gov.my	Sarawak
Water Ordinance 1994	Available for download from: http://lawnet.sarawak.gov.my	Sarawak

Policy documents		
NRE. 2016. <i>National Policy on Biological Diversity 2016-2025</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/590	Malaysia
NRE. 2012. <i>National Water Resources Policy</i> . Ministry of Natural Resources and Environment Malaysia (NRE), Putrajaya, Malaysia.	Available for download from: http://www.nre.gov.my/ms-my/PustakaMedia/Penerbitan/Dasar%20Sumber%20Air%20Negara.pdf	Malaysia
Public Works Department. 2009. <i>National Slope Master Plan 2009-2023</i> . Ministry of Public Works Malaysia, Kuala Lumpur, Malaysia.	Available for download from: http://slopes.jkr.gov.my/images/bkc_dokumen/National_Slope_Master_Plan/NSMP(signed).pdf	Malaysia
NRE. 2009. <i>Managing Biodiversity in the Riparian Zone: A course for planners and decision makers</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Includes among other information, maps on landslide prone areas, annual rainfall patterns, rainfall stations and rain gauge stations. The Master Plan contain Sectoral Reports Vol. 2 and Vol. 3. Available for download from: http://www.nre.gov.my/ms-my/Biodiversiti/BioD%20Knowledge/RiparianGuideline.pdf	Malaysia
DID. 2011. <i>Guideline for: the development related to river and reserve</i> . Department of Irrigation and Drainage DID) Government of Malaysia.	Available for download from: http://jps.vox10.com/jps/resources/auto%20download%20images/5840fff73af7c.pdf (Only available in Bahasa Malaysia version)	Peninsular Malaysia
DTCP. 2014. <i>National Physical Plan-2 (NPP-2)</i> . Department of Town and Country Planning, Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from: Department of Town and Country Planning, Peninsular Malaysia. Tel: +603-2264 6004 Available for download from: http://www.townplan.gov.my/publication.php?cat=17	Peninsular Malaysia
DTCP. 2012. <i>National Coastal Zone Physical Plan (NPP-CZ) Vols. 1 & 2</i> . Department of Town and Country Planning, Peninsular Malaysia (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available from DTCP: Contact: Tel: +603-2264 6004 Fax: +603-2273 9680 Bahasa Malaysia version available for download from: http://www.townplan.gov.my/publication.php?cat=9 Includes KSASSP i.e. <i>Kawasan Sensitif Alam Sekitar Persekitaran Pantai</i> (Coastal Zone Environmentally Sensitive Areas)	Peninsular Malaysia
DTCP. 2009. <i>Central Forest Spine 1: Master Plan for ecological linkages</i> . Department of Town and Country Planning (DTCP), Ministry of Housing and Local Government, Kuala Lumpur, Malaysia.	Available for download from: https://www.townplan.gov.my/download/CFS%20I_1.pdf	Peninsular Malaysia

DTCP. 2009. <i>Central Forest Spine 2: Master Plan for ecological linkages</i> . Department of Town and Country Planning, Ministry of Housing and Local Government, Malaysia. Structure and Local Plans	Available for download from: http://www.townplan.gov.my/download/CFS%20II.pdf	Malaysia
Structure and Local Plans	The relevant structure and local plans for the various states and districts in Malaysia are available from the Federal Town and Country Planning Department as well as the respective state offices of the department and local councils. Addresses and contacts may be obtained from: Headquarters Federal Department of Town and Country Planning, Peninsular Malaysia, Ground Floor, Tanjung Block, Jalan Cenderasari, 50646, Kuala Lumpur, Malaysia Tel: +603-2699 2111 Fax: +03-2692 9994 Website: http://www.townplan.gov.my	Malaysia
National Forestry Policy 1978	Available for download from: https://www.forestry.gov.my/index.php/en/about-us/national-forestry-policy	Malaysia
Papers/reports/books		
Colchester, M., S. Chao, P. Anderson & H. Jonas. 2015. <i>Free, Prior and Consent Guide for RSPO members</i> . Roundtable on Sustainable Palm Oil (RSPO), Kuala Lumpur, Malaysia.	Available for download from: https://rspo.org/news-and-events/announcements/free-prior-and-informed-consent-guide-for-rspo-members-2015-endorsed	Malaysia
Goh, K.S. 1974. <i>Hydrological Regions of Peninsular Malaysia</i> . Ministry of Agriculture and Rural Development, Kuala Lumpur, Malaysia.	Available for download from: https://www.water.gov.my/jps/resources/auto%20download%20images/587465da88eee.pdf	Peninsular Malaysia
Goh, K.S. 1974. <i>Surface Water Resources Map (Provisional) of Peninsular Malaysia and Explanatory Notes</i> . Ministry of Agriculture and Fisheries, Kuala Lumpur, Malaysia.	Available for download from: https://www.water.gov.my/jps/resources/auto%20download%20images/58746593dxxxx.pdf	Peninsular Malaysia
NAHRIM. 2008. <i>Compendium of Malaysian hydrogeological research papers and reports titles</i> . Ministry of Natural Resources and Environment Malaysia (NAHRIM), Selangor, Malaysia.	Out of stock. For enquiry on availability in library please contact NAHRIM library at: Email: mrizal@nahrim.gov.my Tel: +603 8947 6400 Extn: 6575	Peninsular Malaysia
Ranhill Consulting Sdn. Bhd. 2011. <i>Review of the National Water (2000-2050) and Formulation of National Water Resources Policy, Final Report, August 2011</i> . Report prepared by Ranhill for the Department of Irrigation and Drainage, Kuala Lumpur, Malaysia.	This report consists of 20 volumes and most of the volumes can be downloaded from: http://gedung1nahrim.nahrim.gov.my/WebPages/Water-Resources.aspx?met=RP&smet=WR Contact: Department of Irrigation & Drainage Jalan Sultan Salahuddin, 50626 Kuala Lumpur, Malaysia. Tel: 603-2616 1500 Fax: 603-2698 7973 Email: pro@water.gov.my web@water.gov.my	Peninsular Malaysia

Web Resources		
Department of Survey and Mapping Malaysia's database of map resources	www.jupem.gov.my Map resources include unrestricted and restricted topographical maps, digital terrain model, thematic maps etc.	Malaysia
European Digital Archive of Soil Maps (EuDASM) – Soil maps of Asia	http://eusoiils.jrc.ec.europa.eu/ESDB_Archive/EuDASM/Asia/lists/cmy.htm	
Other Data Resources		
Geology	Maps and reports of geological surveys conducted in different areas are available from the Department of Mineral and Geoscience.	Malaysia
Location of dams, water intake points and other infrastructure, abstraction rates etc.	A list of water intake points and their catchment areas can be found in Schedule 6 of the Environmental Quality (Industrial Effluent) Regulations 2009 (P.U. (A) 434) of the Environmental Quality Act 1974. Available for download at: https://www.doe.gov.my/portalv1/wp-content/uploads/2015/01/Environmental_Quality_Industrial_Effluent_Regulations_2009_-_P.U.A_434-2009.pdf Data should also be obtained from the relevant water supply companies, the Water Supply Department and relevant documents (e.g. the National Physical Plan, National Water Resources Study Review 2000-2050 etc.).	Malaysia
Waste water effluent discharge points	This is site specific and the specific locations of the discharge points may be obtained from the project proponent/concessionaire or the Department of Environment.	Malaysia
List and maps of Permanent Reserved Forests particularly those that have been classified for soil and water catchment protection	A list of Permanent Reserved Forests gazetted for soil and water catchment protection in Peninsular Malaysia can be extracted from the Protected Areas Master List which also provides the reference number for the gazette plans (maps) which is needed when purchasing the relevant map from the Survey and Mapping Department (JUPEM). The Master List of Protected Areas in Malaysia should be available on the MyBIS website once approved: www.mybis.gov.my In the meantime, there is draft interim version of the Protected Area Master List which may be available on request from the Ministry of Natural Resources and Environment. Tel: +603 8861129 A partial dataset is available in an interactive map of protected areas on the MyBIS portal: https://www.mybis.gov.my/one/pamaps.php A finalised version of the Protected Area Master List is expected to be published in 2018.	Peninsular Malaysia

<p>List of power stations in Malaysia including on location, capacity, etc.</p>	<p>Data available at: https://en.wikipedia.org/wiki/List_of_power_stations_in_Malaysia#Peninsular_Malaysia</p> <p>A website listing data power plants in Peninsular Malaysia including hydro and fuel powered plants with locations and power.</p>	<p>Peninsular Malaysia</p>
<p>Topographic maps 1:50,000 Peninsular Malaysia – Series No. DNMM5101.</p>	<p>Non-restricted version of topographic maps at scale of 1:50,000 covering Peninsular Malaysia only. These maps are produced in full colour showing cultural feature, vegetation and cultivation, hydrography, relief and annotation.</p> <p>Can be purchased from: Department of Survey and Mapping Malaysia Tel: +603-26170800, Fax: +603-26933618 Email: hqweb@jupem.gov.my</p> <p>Website: https://www.jupem.gov.my/v1/en/product-services/unrestricted-map/</p> <p>Cultural features consist of highways and roads, railways, building, boundaries etc. Relief is shown as contour lines with 100m interval and heights in meters.</p>	<p>Peninsular Malaysia</p>
<p>Topographic maps 1:50,000 Peninsular Malaysia – Series No. L7030.</p>	<p>Restricted version of topographic maps at scale of 1:50,000 covering Peninsular Malaysia only. These fully coloured maps depict man-made features, vegetation and cultivated areas, hydrography and relief with annotations.</p> <p>May be purchased from: Department of Survey and Mapping Malaysia Tel: +603-26170800, Fax: +603-26933618 Email: hqweb@jupem.gov.my</p> <p>Website: https://www.jupem.gov.my/v1/en/product-services/restricted-map/</p> <p>Relief is shown as contour lines with 20m interval and heights in meters. Vegetation and cultivations, town and built-up areas shown with specified symbols. Hydrographic features are also shown.</p>	<p>Peninsular Malaysia</p>
<p>Topographic maps 1:50,000 Sabah & Sarawak – Series No. DNMM5201</p>	<p>Non-restricted version of topographic maps at scale of 1:50 000 and covering Sabah and Sarawak only.</p> <p>These maps are produced in full colour showing cultural feature, area classification, hydrography, relief and annotation.Can be purchased from: Department of Survey and Mapping Malaysia Tel: +603-26170800, Fax: +603-26933618 Email: hqweb@jupem.gov.my</p> <p>Website: https://www.jupem.gov.my/v1/en/productservices/restricted-map/</p> <p>Cultural features consist of highways and roads, railways, building and boundaries. Relief is shown as contour lines with 100m interval and heights in meters</p>	<p>Sarawak & Sabah</p>

<p>Topographic maps 1:50,000 Sabah & Sarawak – Series No T738.</p>	<p>Restricted version of topographic maps at scale of 1:50,000 and covering Sabah and Sarawak. These map are produced in full colour showing cultural feature, area classification, hydrography, relief and annotation.</p> <p>May be purchased from: Department of Survey and Mapping Malaysia Tel: +603-26170800, Fax: +603-26933618 Email: hqweb@jupem.gov.my</p> <p>Website: https://www.jupem.gov.my/v1/en/productservices/restricted-map</p>	<p>Sarawak & Sabah</p>
<p>Soil map of Sarawak: Malaysia Timor. Sheet A. 1968. Land and Survey Department, Sarawak. Directorate of National Mapping Malaysia. The Soil Maps of Asia. European Digital Archive of Soil Maps – EuDASM.</p>	<p>Available for download from: https://esdac.jrc.ec.europa.eu/content/-soil-map-sarawak-malaysia-timor-sheet</p> <p>Sourced from: Joint Research Centre European Soil Data Centre (ESDAC)</p>	<p>Sarawak</p>

*Note: only the parent legislation is listed as each act/enactment/ordinance may have numerous subsidiary legislation (rules/orders/regulations/schedules etc.) and also amendments.

Annex 5: List of data sources for HCV 5

Reference	Availability	Application
Legislation*		
Access to Biological Resources and Benefit Sharing Act 2017	Available for download from: http://www.cjljlaw.com/files/bills/pdf/2017/MY_FS_BIL_2017_24.pdf	Malaysia
Aboriginal Peoples Act 1954	Available for download from: http://www.kptg.gov.my/sites/default/files/article/Act%20134-Oboriginal%20Peoples%20Act.pdf	Peninsular Malaysia
National Forestry Act 1984	Available for download from: https://www.forestry.gov.my/index.php/en/akta-perhutanan-negara-1984	Peninsular Malaysia
Forest Enactment 1968	Available for download from: http://www.lawnet.sabah.gov.my/lawnet/sabahlaws/StateLaws/ForestEnactment1968.pdf	Sabah
Land Ordinance 1930 (Sabah Cap. 68)	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws/LandOrdinance.pdf and http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws.aspx	Sabah
Native Courts Enactment 1992	Available for download from: http://www.lawnet.sabah.gov.my/lawnet/SabahLaws/StateLaws/viewdoc.aspx?document=NativeCourtsEnactment1992.pdf	Sarawak
Sabah Biodiversity Enactment 2000	Available for download from: http://www.wipo.int/edocs/lexdocs/laws/en/my/my055en.pdf	Sarawak
Sarawak Biodiversity Centre Ordinance 1997	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws.aspx A key subsidiary legislation is the Sarawak Biodiversity Regulations 2016 which includes sections on access to biological resources for research and development and benefit sharing agreement for research.	Sarawak
Sarawak Rivers Ordinance 1993	Available for download from: http://lawnet.sarawak.gov.my/lawnet_file/Ordinance/ORD_CHAPT4hwm.pdf	Sarawak
Natural Resources and Environment Ordinance 1958	Available for download from: http://lawnet.sarawak.gov.my/lawnet_file/Ordinance/ORD_NRE%20ORD.%20LawNet(Watermark)(FRO).pdf	Sarawak

Policy documents		
NRE. 2016. <i>National Policy on Biological Diversity 2016-2025</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: https://www.mybis.gov.my/pb/590	Malaysia
Papers/Reports/Books		
AIPP. 2014. <i>Training manual for indigenous peoples on Free, Prior and Informed Consent</i> (FPIC). Asia Indigenous Peoples Pact (AIPP), Chiang Mai, Thailand.	Available for download from: https://aippnet.org/wp-content/uploads/2014/11/FPIC_Manual-Small.pdf	Malaysia
Colchester, M., S. Chao, P. Anderson & H. Jonas. 2015. <i>Free, Prior and Informed Consent</i> (FPIC): Guide for RSPO members. Roundtable on Sustainable Palm Oil (RSPO), Kuala Lumpur, Malaysia.	Available for download from: https://rspo.org/news-and-events/announcements/-free-prior-and-informed-consent-guide-for-rspo-members-2015-endorsed	Malaysia
Nicholas, C. & J. Lasimbang (eds.). 2004. <i>Deliberations at the National Roundtable on Biodiversity and indigenous knowledge systems in Malaysia</i> . Centre for Orang Asli Concern (COAC) for Jaringan Orang Asli SeMalaysia (JOAS), Subang Jaya, Malaysia.	Available for download or purchase from: http://www.coac.org.my/main.php?%20section=publications&article_id=57	Malaysia
Kardooni, R., Fatimah Binti Kari, Siti Rohani Binti Yahaya & Siti Hajar Yusup. 2014. Traditional knowledge of Orang Asli on forests in Peninsular Malaysia. <i>Indian Journal of Traditional Knowledge</i> 13(2): 283-291.	Available for download from: https://www.semanticscholar.org/paper/Traditional-knowledge-of-orang-asli-on-forests-in-Kardooni-Kari/2b319d47dac58d79a641ea00b215acdd31c77c8d	Peninsular Malaysia
Tarmiji Masron, M. Fujimaki, & Norhasimah Ismail. 2013. Orang Asli in Peninsular Malaysia: Population, Spatial Distribution and Socio-Economic Condition. <i>Ritsumeikan Journal of Social Sciences and Humanities</i> 6: 75-115	Available for download from: http://www.ritsumei.ac.jp/acd/re/k-rsc/hss/book/pdf/vol06_07.pdf	Peninsular Malaysia
Ab. Halim, A., N. Othman, S.R. Ismail, J.A. Jawan & N.N. Ibrahim. 2012. Indigenous knowledge and biodiversity conservation in Sabah. <i>Int. Journal of Social Science and Humanity</i> Vol. 2(2): 159-163.	Available for download from: http://www.ijssh.org/papers/88-CH016.pdf Sabah	Sabah
Ramy Bulan & A. Locklear. 2008. Legal Perspectives on Native Customary Land Rights in Sarawak. Human Rights Commission of Malaysia (SUHAKAM), Kuala Lumpur, Malaysia.	Available for download from: http://www.suhakam.org.my/wp-content/uploads/2013/12/Legal-Perspectives.pdf	Sarawak

Policy documents		
A final draft of Environmental & Social Safeguard (ESS) Standards for REDD+ in Sabah (2017)	Contact: Sabah Forestry Department Locked Bag 68, 90009 Sandakan, Sabah, Malaysia. Tel: +60 89242500 Website: http://www.forest.sabah.gov.my/	Malaysia
Web Resources		
Department of Statistics	www.dosm.gov.my	Malaysia
Malaysia (DOSM), official portal Malaysia's open data portal	http://www.data.gov.my/ Contains a wide range of datasets including on socio-economics, national statistics etc.	Malaysia
Basic data/statistics on Orang Asli	https://www.coac.org.my/main.php?section=about&article_id=4 Compiled by the Centre for Orang Asli Concerns (COAC)	Peninsular Malaysia
Other Data Sources		
Data on indigenous communities	Data on e.g. location of villages, cultural practices etc. may be obtained from the relevant government agencies and NGOs. Government agencies: <ul style="list-style-type: none"> • <i>Jabatan Kemajuan Orang Asli/Department of Orang Asli Development (JAKOA):</i> www.jakoa.gov.my • <i>Majlis Adat Istiadat Sarawak/Council for Customs and Traditions:</i> http://www.nativecustoms.sarawak.gov.my/ • Majlis Hal Ehwal Anak Negeri Sabah • Sabah Cultural Board: http://www.sabah.gov.my/lks/v2/index.php?q=content/introduction-ONGOS: • Borneo Resources Institute (BRIMAS): http://brimas.www1.50megs.com/ • Centre for Orang Asli Concerns (COAC): www.coac.org.my • Kadazan Dusun Cultural Association (KDCA) : http://www.kdca.org.my/ • PACOS Trust: https://pacostrust.com/ • Sarawak Dayak Iban Association (SADIA): https://sarawakdayakibanassoc.wordpress.com/ <p>The Indigenous Peoples Network of Malaysia or Jaringan Orang Asal Se-Malaysia (JOAS) is the umbrella network for 21 community-based non-governmental organisations that have indigenous peoples' issues as the focus.</p> <p>JOAS: http://orangasal.blogspot.my/</p>	Malaysia

*Note: only the parent legislation is listed as each act/enactment/ordinance may have numerous subsidiary legislation (rules/orders/regulations/schedules etc.) and also amendments.

Annex 6: List of data sources for HCV 6

Reference	Availability	Application
Legislation*		
Access to Biological Resources and Benefit Sharing Act 2017	Available for download from: http://www.federalgazette.agc.gov.my/outputaktab/aktaBI_20171017_795BI.pdf	Malaysia
National Heritage Act 2005	Available for download from: http://www.gtwhi.com.my/images/stories/files/NATIONAL%20HERITAGE%20ACT%202005.pdf	Malaysia
National Forestry Act 1984	Available for download from: https://www.forestry.gov.my/index.php/en/akta-perhutanan-negara-1984	Peninsular Malaysia
National Land Code 1965	Available for download from: http://www.kptg.gov.my/sites/default/files/article/NLC1956DIGITAL-VER1.pdf	Peninsular Malaysia
Wildlife Conservation Act 2010	Download available from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws.aspx Incorporating lists of protected and totally protected animals in Peninsular Malaysia	Peninsular Malaysia
Cultural Heritage (Conservation) Enactment 1997	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws/CulturalHeritage%28Conservation%29Enactment1997.pdf	Sabah
Forests Enactment 1968	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws.aspx	Sabah
Land Ordinance 1930 (Sabah Cap. 68)	Available for download from: http://www.lawnet.sabah.gov.my/Lawnet/SabahLaws/StateLaws/LandOrdinance.pdf and https://www.sabahlaw.com/landord.htm Incorporating the Land (Amendment) Enactment 2012	Sabah
Native Courts Enactment 1992	Available for download from: http://ww2.sabah.gov.my/mlgh/NativeCourtsEnactment1992.pdf	Sabah
Sabah Biodiversity Enactment 2000	Available for download from: http://www.wipo.int/edocs/lexdocs/laws/en/my/my055en.pdf	Sabah
Wildlife Conservation Enactment 1997	Available for download available from: https://www.sabahlaw.com/Wildliferegulation.htm Incorporating lists of totally protected and protected animals and plants in Sabah.	Sabah
Forests Ordinance 2015	Available for download from: http://lawnet.sarawak.gov.my/	Sarawak
Native Customs (Declaration) Ordinance 1996	Available for download from: http://lawnet.sarawak.gov.my/	Sarawak

Native Courts Ordinance 1992	Available for download from: http://www.betong.sarawak.gov.my/modules/web/pages.php?mod=publication&sub=publication_-show&id=10 Including subsidiary legislation such as: <ul style="list-style-type: none"> • Adat Bidayuh Order 1994. • Adat Iban Order 1993. • Dayak Adat Law Second Division 1963 This law supersedes the Native Courts Ordinance 1958 which has been repealed.	Sarawak
Natural Resources and Environment Ordinance 1958	Available for download from: http://lawnet.sarawak.gov.my/lawnet_file/Ordinance/ORD_NRE%20ORD.%20LawNet(Watermark)(FRO).pdf	Sarawak
Sarawak Cultural Heritage Ordinance 1993	Available for download from: http://lawnet.sarawak.gov.my/lawnet_file/Ordinance/ORD_CAP6hwm.pdf	Sarawak
Sarawak Biodiversity Centre Ordinance 1997	Available for download from: http://lawnet.sarawak.gov.my/	Sarawak
Sarawak Land Code 1958	Available for download from https://pengayau.files.wordpress.com/2012/04/sarawak-land-code-chapter-81-tmp.pdf	Sarawak
Wild Life Protection Ordinance 1998	Available for download available from: http://lawnet.sarawak.gov.my Incorporating lists of totally protected and protected animals and plants in Sarawak.	Sarawak
Policy documents		
MOTAC. 2016. <i>National Ecotourism Plan 2016-2025</i> (3 volumes). Ministry of Tourism and Culture Malaysia (MOTAC), Putrajaya, Malaysia.	Policy documents Available for download from: http://www.motac.gov.my/en/download/category/86-pelan-eko-pelancongan-kebangsaan-2016-2025	Malaysia
NRE. 2016. <i>National Policy on Biological Diversity 2016-2025</i> . Ministry of Natural Resources and Environment (NRE), Putrajaya, Malaysia.	Available for download from: http://www.motac.gov.my/en/download/category/86-pelan-eko-pelancongan-kebangsaan-2016-2025	Malaysia
Published papers/reports		
Lasimbang, A. 2004. Community Mapping in Malaysia: The use of community maps in resources management and protecting rights over indigenous peoples' territory. Paper presented at the Regional Community Mapping Network Workshop, Nov. 8-10, 2004, Quezon City, Philippines.	Available for download from: http://www.iapad.org/wp-content/uploads/2015/07/pacos.pdf	Malaysia
Colchester, M., S. Chao, P. Anderson & H. Jonas. 2015. <i>Free, Prior and Informed Consent (FPIC): Guide for RSPO members</i> . Roundtable on Sustainable Palm Oil (RSPO), Kuala Lumpur, Malaysia.	Available for download from: https://rspo.org/news-and-events/announcements/-free-prior-and-informed-consent-guide-for-rspo-members-2015-endorsed	Malaysia

Web resources		
List of National Heritage sites in Malaysia	http://www.heritage.gov.my/en/heritage-registration/heritage-list/site/natural-sites	Malaysia
List of UNESCO World Heritage sites in Malaysia	http://whc.unesco.org/en/statesparties/my	Malaysia
Other Data Sources		
Data on traditional customs, cultural practices etc.	<p>Government agencies:</p> <ul style="list-style-type: none"> • <i>Jabatan Kemajuan Orang Asli</i>/Department of Orang Asli Development (JAKOA): www.jako.gov.my • <i>Majlis Adat Istiadat Sarawak</i>/Council for Customs and Traditions: http://www.nativecustoms.sarawak.gov.my/ • <i>Majlis Hal Ehwal Anak Negeri Sabah</i> • Sabah Cultural Board: http://www.sabah.gov.my/lks/v2/index.php?q=content/introduction-0 <p>NGOS:</p> <ul style="list-style-type: none"> • Borneo Resources Institute (BRIMAS): http://brimas.www1.50megs.com/ • Centre for Orang Asli Concerns (COAC): www.coac.org.my • Kadazan Dusun Cultural Association (KDCA): http://www.kdca.org.my/ • PACOS Trust: https://pacostrust.com/ • Sarawak Dayak Iban Association (SADIA): https://sarawakdayakibanassoc.wordpress.com/ <p>The Indigenous Peoples Network of Malaysia or Jaringan Orang Asal Se-Malaysia (JOAS) is the umbrella network for 21 community-based non-governmental organisations that have indigenous peoples' issues as the focus.</p> <p>JOAS: http://orangasal.blogspot.my/</p>	Malaysia

Annex 7: Ecosystem representation within protected areas in Peninsular Malaysia

This ecosystem assessment for Peninsular Malaysia was conducted as part of a collaborative project between the Malaysian Ministry of Natural Resources and Environment (NRE) and the Danish International Development Assistance (DANIDA) on biodiversity mainstreaming. The GIS analysis for the ecosystem assessment was conducted during the period between 2008 and 2009 by Y.C. Nyon and supervised by M. Junkov and S. Suksuwan. The protected area dataset used for the analysis was compiled by S. Zuraidah and S. Suksuwan who were then with WWF-Malaysia. The protected area dataset was compiled through the Protected Area Master List project and consisted of gazetted protected areas as of 2008.

The distribution of ecological or vegetation types is modelled based on surrogate map information e.g. soil types, elevation, land use, etc. following the classification of forest formations and vegetation types as described by Symington (1943) and Whitmore (1984). Land use data used in the GIS analysis was sourced from the Department of Agriculture for the following years: 1966, 1990 and 2006. The original extent of the vegetation types was based on a hypothetical time in the past before the industrial age when the Peninsular Malaysia was still covered entirely with natural vegetation.

The key outputs of the analysis were a series of maps showing the extent of main vegetation types for 1966, 1990 and 2006. The protected area layer was then overlaid on the 2006 vegetation map to estimate the extent of vegetation types occurring within protected areas. This was compared with the map of the original extent of the vegetation types in order to calculate the percentage of existing land cover within protected areas out of the original extent for each vegetation type. A threshold of 10% was used for identifying critical vegetation/ecological types that should be prioritised for conservation purposes (as highlighted in yellow in Table A).

The findings of the ecosystem assessment were not published but the map outputs had been used by NRE for various purposes. During the Protected Areas Managers' Conference in 2014 at Taman Negara National Park, a presentation on the status of protected areas in Malaysia included the map outputs and analysis table from the assessment. This presentation is documented in the proceedings of the conference which is cited as the source for Table A.

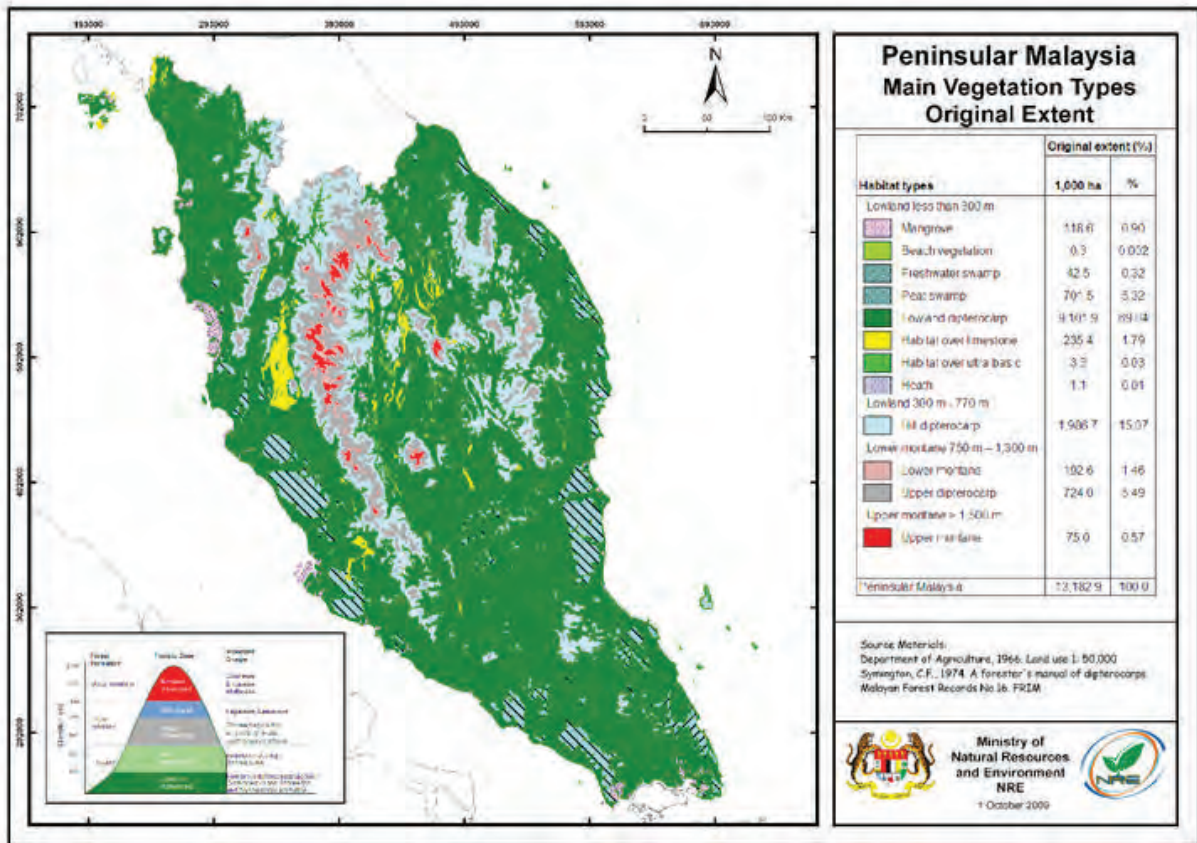


Figure A: Map showing the hypothetical original extent of major vegetation types in Peninsular Malaysia

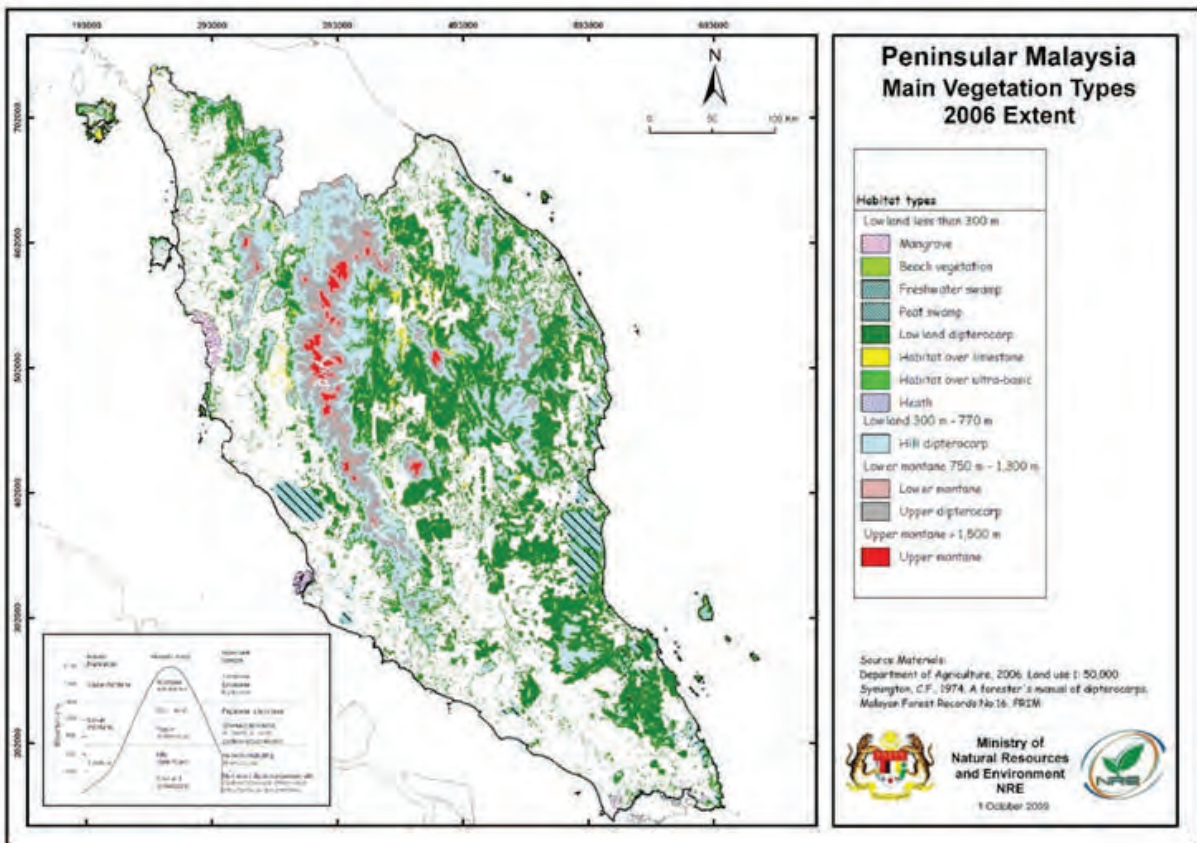


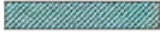











Figure B: Map showing the extent of major vegetation types in Peninsular Malaysia as of 2006



Figure C: Map showing the protected area layer that was used in the GIS analysis

Table A: Extent of major ecological types in Peninsular Malaysia in 2006 compared to their original extent, and the percentage of these ecological types within protected areas compared to their original extent

Ecosystem types	Original extent (1,000ha)	Current Extent (2006) (1,000ha)	% current vs original extent	Total in PA (1,000ha)	% in PA (of original extent)
Lowland less than 300 m					
 Mangrove	118.6	88.3	74.5	2.30	1.9
 Beach vegetation	0.3	0.1	33.3	0.01	3.3
 Freshwater swamp	42.5	25.1	59.0	6.60	15.5
 Peat swamp	701.5	338.5	48.3	15.10	2.2
 Lowland dipterocarp	9,101.9	3,398.0	37.3	938.40	10.3
 Habitat over limestone	235.4	60.4	25.7	11.40	4.8
 Habitat over ultra-basic	3.3	1.2	36.4	0.02	0.6
 Heath	1.1	0.7	63.6	0.02	1.8
Lowland 300 m - 770 m					
 Hill dipterocarp	1,986.7	1,938.7	97.6	600.10	30.2
Lower montane 750 m - 1,300 m					
 Lower montane	192.6	186.5	96.8	94.90	49.3
 Upper dipterocarp	724.0	716.9	99.0	301.50	41.6
Upper montane > 1,500 m					
 Upper montane	75.0	73.0	97.3	38.90	51.9
Peninsular Malaysia (P.M.)	13,182.9	6,827.4		2009.25	

Source: Suksuwan & Zuraidah (2014)

Annex 8: Stakeholder Consultation Participants

A. Technical Working Group Kick-off Meeting, 22nd November 2016, Kuala Lumpur

No.	Organisation
1	Department of Standards Malaysia
2	Department of Wildlife and National Parks
3	Felda Global Venture (FGV) Berhad
4	Forestry Department Peninsular Malaysia
5	Forest Research Institute Malaysia
6	Forever Sabah
7	Global Environment Centre
8	LEAP Spiral
9	Malaysia Environmental Consultant
10	Malaysia Nature Society (Kuching branch)
11	Malaysia Nature Society (Sabah branch)
12	Malaysian Palm Oil Certification Council
13	NEPCon
14	Roundtable on Sustainable Biomaterials
15	Roundtable on Sustainable Palm Oil
16	Sabah Environmental Trust
17	Sarawak Oil Palms Plantation Owners Association
18	Sime Darby Plantation Berhad
19	Johor State Forestry Department
20	Kelantan State Forestry Department
21	Perak State Forestry Department
22	Selangor State Forestry Department
23	TSH Resources Berhad
24	Universiti Putra Malaysia
25	Universiti Malaya
26	Universiti Malaysia Sarawak
27	Wilmar International (PBB Palm Oil Berhad)
28	WWF (Peninsular Malaysia)

B. Regional Stakeholder Consultation: Sarawak, 2nd October 2017, Kuching, Sarawak

No.	Organisation
1	Dayak Oil Palm Plantation Organisation
2	Envirotech Environmental Consultancy
3	Global Environment Centre
4	IOI Group
5	Kuala Lumpur Kepong Plantation
6	Malaysia Nature Society (Kuching branch)
7	Persatuan Dayak Sarawak
8	Sarawak Dayak Iban Association
9	Sarawak Forestry Corporation
10	Sarawak Oil Palms Plantation Owners Association
11	Sarawak Timber Association
12	University Malaysia Sarawak
13	Wilmar International (PBB Palm Oil Berhad)
14	WWF Sarawak

C. Regional Stakeholder Consultation: Sabah, 3rd October 2017, Kota Kinabalu, Sabah

No.	Organisation
1	Forest Solutions Malaysia Sdn. Bhd.
2	Forever Sabah
3	Kiwiheng Environmental Consultants
4	Kwantas Corporation Berhad
5	Malaysia Nature Society Sabah branch
6	Sabah Environmental Trust
7	Sabah Forest Industries Sdn. Bhd.
8	Sabah Forestry Department
9	Sabah Timber Industry Association
10	Sabah Forestry Department
11	TSH Resources Berhad
12	Wilmar International
13	WWF Sabah

D. Regional Stakeholder Consultation: Peninsular Malaysia, 5th October 2017, Kuala Lumpur

No.	Organisation
1	Asrama Raya Sdn. Bhd.
2	Boustead Plantation Sdn Bhd
3	Department of Wildlife and National Parks
4	Felda Global Venture (FGV) Berhad
5	Forest Department Peninsular Malaysia
6	Forest Research Institute Malaysia
7	Genting Plantation Berhad
8	Global Environment Centre
9	IOI Group
10	IOI Loders Croklaan
11	Malaysian Conservation Alliance for Tigers
12	Malaysian Palm Oil Certification Council
13	Nature Economy and People Connected
14	Roundtable on Sustainable Biomaterials
15	Roundtable on Sustainable Palm Oil
16	Sime Darby Plantation Berhad
17	TFT
18	Wild Asia
19	WWF (Peninsular Malaysia)
20	Dylan Ong

E. National Stakeholder Consultation, 4th & 5th December 2017, Kuala Lumpur

No.	Organisation
1	Dayak Oil Palm Plantation Association
2	Department of Wildlife and National Parks
3	Ecological Economic Solutions Sdn. Bhd.
4	Forestry Department Peninsular Malaysia
5	Forest Research Institute Malaysia
6	Forever Sabah
7	Genting Plantations Berhad
8	GP Pusaka Sdn Bhd
9	HUTAN
10	IOI Group
11	Kuala Lumpur Kepong Berhad
12	Malaysia Nature Society (Kuching branch)
13	Malaysia Timber Certification Council
14	Malaysian Palm Oil Certification Council
15	Mike Chong
16	Malaysian Nature Society
17	NEPCon
18	Roundtable on Sustainable Biomaterials
19	Roundtable on Sustainable Palm Oil
20	Sabah Environmental Protection Association
21	Sarawak Forestry Corporation
22	Sarawak Timber Association
23	Sime Darby Plantation Berhad
24	TFT
25	Universiti Putra Malaysia
26	Wilmar International (PBB Palm Oil Berhad)
27	WWF (Peninsular Malaysia)
28	WWF (Sarawak)

