Identifying, Managing, and Monitoring High Conservation Value Forests in Indonesia: A Toolkit for Forest Managers and other Stakeholders

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Introduction

What are high conservation values and high conservation value forests?

The idea of High Conservation Value Forests (HCVFs) was developed by the Forest Stewardship Council (FSC) and first published in 1999. This concept moves the forestry debate away from definitions of particular forest types (eg primary, old growth) or methods of timber harvesting (e.g. industrial logging) to focus on the values that make a forest important. By identifying these key values and ensuring that they are maintained or enhanced, it is possible to make rational management decisions that are consistent with the maintenance of important environmental and social values.

The key to the concept of HCVFs is the identification of High Conservation Values (HCVs), the definition of which is given in Box I. It is these values that are important and need to be maintained. High conservation value forests are simply the forests where these values are found. Having identified HCVs, the forest manager should plan and implement management in such a way as to maintain or enhance the identified HCVs and to put in place a monitoring programme to check that this is being achieved.

Box I: Definition of High Conservation Value Forests
HCVFs are those that possess one or more of the following attributes:

HCV1 Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia).

HCV2 Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.

HCV3 Forest areas that are in or contain rare, threatened or endangered ecosystems.

HCV4 Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control).

HCV5 Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health).

HCV6 Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

FSC Principles and Criteria, February 2000

As well as its use in forest certification, the HCVF approach is therefore increasingly being used for mapping, landscape management and conservation decision-making approaches to forest resources. It is also being used in purchasing policies and recently has begun to appear in discussions and policies of government agencies.

What is the HCVF toolkit?

This Indonesia High Conservation Value Forest (HCVF) Toolkit provides a practical methodology to be used on a routine basis to identify High Conservation Value Forests. It also provides guidance on what types of management and monitoring are necessary if such a forest has been identified.

Once the national High Conservation Values has received input and is finalized, then there are a number of potential uses for this toolkit:

- *Use by forest managers to meet standards related to HCVF*

  Forest managers can carry out evaluations on their forest areas to determine whether any of the defined HCVs are present within their FMU. Forest managers can integrate HCV identification and management into their overall forest management planning and activities. In order to fully implement certification requirements relating to HCVF, this would require HCVs to be an important element of baseline information collection and impact assessment, management planning, implementation of operations and monitoring.

- *Use by certifiers assessing HCVF*

  The defined national HCVs, together with management guidance, should form the HCVF element of national forest management certification standards. This would be dependent on the conclusions having broad support among a range of stakeholders and having been the subject of an inclusive consultation process, in accordance with the rules of the certification scheme.

  Certifiers would also utilise the defined national set of HCVs for carrying out assessments in their evaluation of compliance with certification requirements on specific FMUs.

- *Use by landscape planners trying to prioritise different land uses*

  Based on information that is already held or is being collated, the defined national HCVs can be used to draw up landscape-level plans and maps to show actual or potential HCVFs. Such maps could then be used to inform and prioritise district and regional spatial and land-use planning decisions and conservation planning.

- *Use by purchasers implementing policies to do with HCVF*

  Purchasers implementing HCVF policies can utilise landscape-level information about the presence of HCVs, or use the nationally defined sets of HCVs to also undertake evaluations for the presence of HCVs in specific FMUs, or in setting precautionary purchasing policies.

Use of this Indonesia guide requires some knowledge of the conservation and social issues which constitute the High Conservation Values. Toolkit users must evaluate whether local forest areas are exceptional in terms of ecological and social importance. This will require an understanding of the uniqueness of forest areas and the threats to their resources. It will be key that toolkit users communicate with regional, national and international experts (scientists, research institutions, NGOs) to evaluate the importance of a particular forest area.

The Indonesian HCVF Toolkit has been developed to help interested parties to understand the HCVF concept and conduct an HCVF evaluation. It will also help to ensure more consistent interpretation of the concept within Indonesia. The Toolkit has not been developed by FSC and thus should not be considered as official FSC policy or guidance.

How was the Indonesian HCVF toolkit developed?

The Indonesian HCVF toolkit is based upon the High Conservation Values identified in the FSC's forest management Principle Nine (see Box I above). The toolkit interprets these values within the context of Indonesia and has defined specific High Conservation Values appropriate within the country.

The Toolkit uses a format similar to a Global toolkit developed by ProForest. That document was created to help drafting groups develop guidance on HCVF at the National level. This Indonesian toolkit is the first national interpretation to be developed using the framework provided in the Global toolkit but it is expected that the Global toolkit will be utilized to develop national guidance in countries throughout the world. ProForest and the Nature Conservancy (TNC) facilitated a meeting in March 2002 in Bali to discuss the Global Toolkit. This meeting was attended by many of the organizations working on sustainable forest management and conservation in Indonesia.

The first draft of this document was developed by a group of social scientists, ecologists, landscape planners, certification experts, and forest managers met in Jakarta in October 2002 to develop a draft of the Indonesian HCVF Toolkit. Participants included members of LATIN, TNC-Indonesia, WWF-Indonesia, Fauna-Flora International Indonesia, LEI, CIFOR, ProForest, and Rainforest Alliance, as well as others. Some of the drafting team members had previously worked together with a number of forest managers in East Kalimantan to identify HCVs within their concessions.

The identified HCVs and the toolkit methodology were then tested during a field visit to a forest concession in East Kalimantan in January 2003. Six different experts were involved in this evaluation. The team identified the likely relevant HCVs through the use of the toolkit methodology – evaluating biodiversity, forest type, land use, and watershed/soil type, as well as social impact evaluations and planning documents. Field visits to villages surrounding the concession and to logged and unlogged forest areas were conducted. The team recommended several changes to the toolkit format and identified HCVs, including a simplified version of the various questionnaires and guidelines for assessing the presence of social HCVs. The social sections of the report are based in part on a participatory method developed by TNC for assessing the presence and levels of stress and threats of various conservation elements with communities. It enables managers and other stakeholders to discuss strategies to mitigate stresses and threats and to manage resources in a sustainable way.

Following the completion of the draft toolkit, a meeting/seminar was held to discuss the toolkit and receive input from stakeholders. Following this input, the toolkit will be finalized and made freely available for interested parties.

Using the toolkit

The toolkit includes one chapter for each of the six types of High Conservation Values, as well as an appendix. Each chapter begins with an introduction (including the FSC defined value) and a list of the relevant components of the high conservation value for Indonesia. These are the values that users must examine within the context of a forest management area.

Each component is then discussed individually and includes a rationale and instructions/guidance to users on the identification of the presence of the value and on managing and monitoring the forest resource to maintain the value. These sections form the heart of the HCVF toolkit.

Rationale

The rationale provides background and justification as to why a particular attribute is considered of high conservation value. Further, the rationale lists the specific types of forest or forest use that should be considered as an HCV.

Identifying the Presence of the HCV

For each component, the toolkit includes a methodology for evaluating if the component is applicable within a forest management unit. Toolkit users are asked to compile information or answer questions that can be examined using government and forest management planning documents, maps and satellite images, knowledge of the trends and threats to forest resources, and consultations with local communities and other stakeholders.

The identification process and task depends upon the complexity of each component. For components that are relatively simple to evaluate, the toolkit includes a description of an appropriate task to make this determination.

However, for many components (e.g. HCVs 5&6), the evaluation process will be more complicated, time-consuming, and possibly costly. In these cases, the toolkit has divided the process into preliminary and full assessments and, for social values, a threshold for determining if a value is fundamental or critical to the well-being of local communities.

The preliminary assessment is a simple methodology to see if HCVs are likely to occur or not. This acts as a coarse filter, to rapidly exclude all those forests that definitely do not contain HCVs, and to identify forests that do potentially contain specific HCVs. The preliminary assessment should be straightforward enough to be undertaken by people without specialist knowledge of biological or social sciences (e.g. forest managers and timber purchasers). The preliminary assessment is usually in the form of a "yes or no" question and asks about the presence of certain values. For example, a preliminary assessment may ask users to identify if communities or protected areas exist nearby an examined FMU. If the answer to the preliminary question in yes, then the toolkit user will need to conduct a more complete or full assessment for the value. Preliminary assessments often utilise maps and other information that can be easily accessed by forest managers. If a toolkit user determines that a forest area does not exhibit the characteristics, then this HCV does not need to be further examined.

The full assessment is a more detailed methodology to identify in detail what the potential HCVs are or to clarify that there are no HCVs. This is a more thorough examination of the characteristics of the forest area or forest use and requires more information and expertise. A full assessment will usually require that the toolkit user contact relevant experts and stakeholders and/or conduct specific research and consultations.

Thresholds and the identification of social high conservation values (HCVs 5 & 6)

Most rural communities in Indonesia located near forest areas utilize them – for basic needs (e.g. food, income and construction materials), cultural identities, and pleasure. However, this relationship varies greatly in different regions and among different cultural groups within Indonesia. It is very difficult to determine which uses and traditions are critical and which are not. Inevitably, an attempt to develop single, national definitions of these HCVs in a country as diverse as Indonesia will be flawed as HCV identified values would be appropriate in some cases and irrelevant or incomplete in other areas.

Thus, a modified process is used to identify HCVs 5 & 6. Specific components have not been identified as in the other sections of the toolkit. Instead, the toolkit provides examples of values and thresholds to help toolkit users determine when the relationship between forest areas and local communities is strong enough to be considered an HCV.

Thresholds are created to help understand the HCV definitions within Indonesia. When is a forest fundamental to a community's well-being? When is a forest area critical to a community's culture? Thresholds can be either quantitative or qualitative.

The process for identifying relevant social values utilizes three steps – a preliminary assessment, full assessment, and threshold evaluation. For most of the other HCVs, the threshold has already been incorporated into the definition and therefore a forest manager must only decide whether or not a particular forest contains this. However, as social values will frequently be applicable in Indonesia, the toolkit user must evaluate whether the forest area is critical to maintaining that value. For example, if a community utilizes local forests for hunting, the threshold questions help evaluate how reliant communities are on the forest as a source of protein, and therefore whether or not the source of protein is a HCV.

The thresholds are questions that will be examined as part of the consultative process with local communities and are strongly linked to the information necessary to complete the full assessment of these values.

Thus the process for identifying social values will be:

- Preliminary Assessment Questions: If relevant → Full Assessment
- Full assessment Questions: If relevant → Threshold Analysis
- Meets Threshold Criteria: ***HCV Identified***

The toolkit drafting team developed the social section based upon members' experience in numerous regions of the country. However, it is likely that the toolkit has failed to identify every type of potential HCV. Thus, this toolkit should be utilized as a guide, but not as a definitive rule.

It is critical that toolkit users consult with local villages and other forest users on how each community values a forest area.

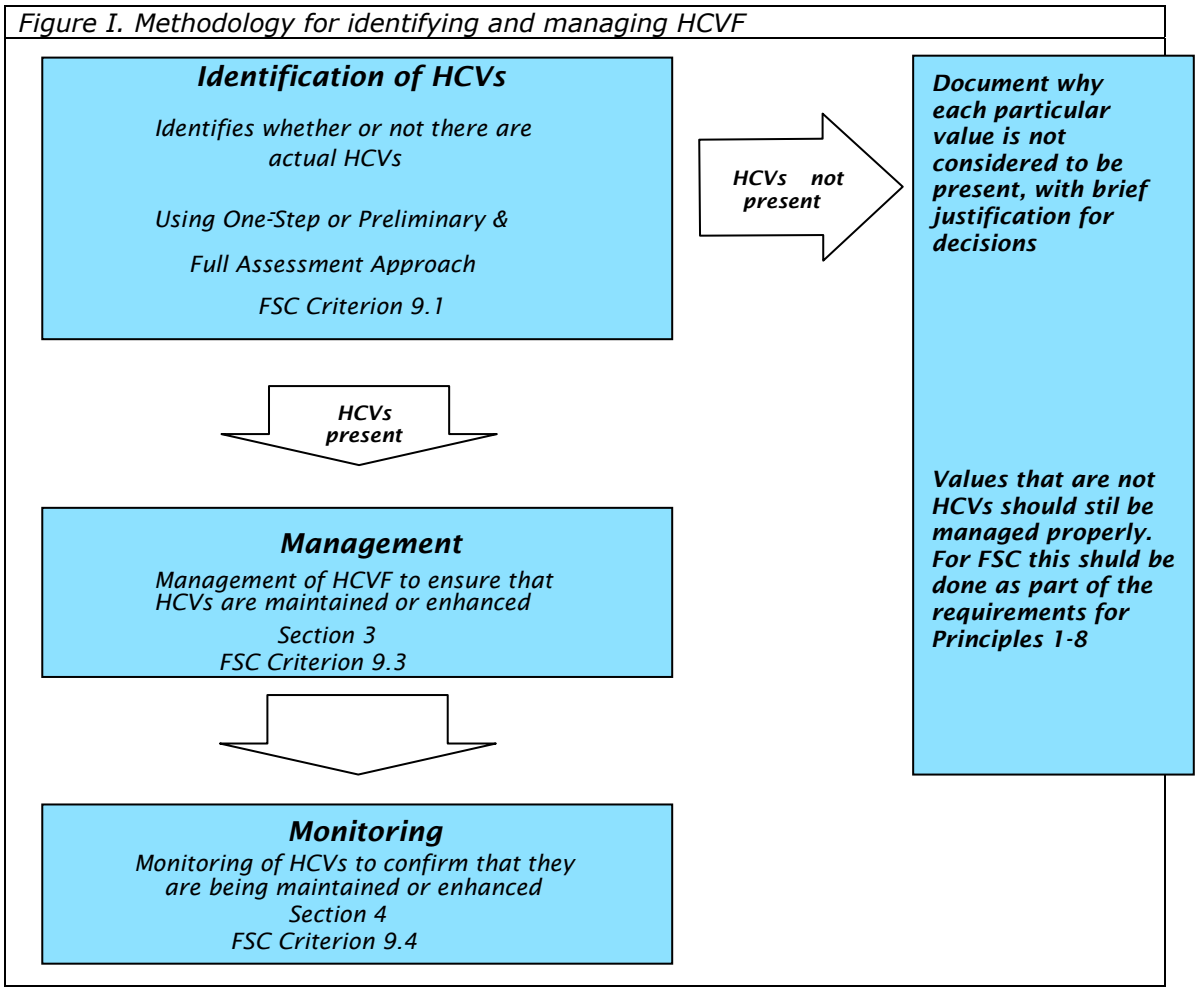
Recommendations for managing for the protection of the value and monitoring

If, after evaluation, it is found that a particular HCV is not present within the FMU, no further action is necessary. If a value/component is present within the FMU, then the manager must take steps to make necessary changes to ensure the maintenance of the

identified value through appropriate management and monitoring of the value. See Figure I below.

Recommendations are included to help toolkit users develop strategies to maintain the HCVs present within a forest area. Recommendations are brief and are meant to guide users on the types of information and consultations necessary to develop effective planning and monitoring programs. The guidance provided is not meant as standard operating procedures. Other organizations in Indonesia are developing more comprehensive guides to help forest managers and other stakeholders develop management and monitoring strategies for maintaining or enhancing HCVs. These documents are being developed to be used side-by-side this toolkit. Thus, the toolkit drafting group focused its efforts on providing guidance on identifying HCVs within Indonesia. For additional information regarding efforts to develop in depth management and monitoring information, please contact the Nature Conservancy at tnc@samarinda.org.

Figure I. Methodology for identifying and managing HCVF



Keys to success

Consulting experts and developing partnerships

The toolkit-drafting group realizes that the diversity and highly variable conservation context and land use patterns of different regions makes the development of nationally relevant definitions and lists of HCVs very difficult. Thus, the toolkit has often avoided defining values with specific sizes and numbers. Instead, toolkit users are encouraged to consider the island and ecoregion context of the forest area – which is not provided through this document. Thus, other sources of information and resources will be necessary.

The HCVF toolkit requires users to identify HCVs that cover a wide range of ecological, environmental, and social issues and requires an understanding of regional biodiversity issues, animal and plant ranges and behaviour, water and soil resources, ecosystem health, anthropology, and local economy. It is very likely that toolkit users will not have all of the expertise necessary to evaluate these issues alone. The toolkit process is highly reliant upon the input of local and national expert organizations and individuals.

Users should consult with experts during HCV identification and while developing management and monitoring techniques. In a number of cases, these organizations should provide the key inputs as to whether a forest area/forest type should be considered critical, threatened, etc. Expert organizations will also be able to provide input on the status of forest types and rare, threatened, and endangered species and help devise management strategies to ensure the maintenance or enhancement of these values.

Who are regional and national experts? The drafting group identified a number of relevant organizations within the Toolkit – including Wetlands International and Bird Life International. Other organizations and scientific institutions will also be relevant. Appendix 4 provides a list of organizations that can provide information on communities and conservation for a number of provinces. The more relevant and reliable experts users consult and collaborate with, the greater the likelihood that good decisions will be made.

Precautionary approach

An important component of the management of HCVFs is the application of the Precautionary Approach. HCVFs are, by definition, the most important forests from a conservation or social perspective (depending on the HCVs identified). Therefore, it is critically important that the values identified are not lost. But with the current level of knowledge about forests and how they function, it is not possible to be sure in every case that a particular management strategy will work. Therefore, it is essential to use the precautionary approach when dealing with HCVFs.

In practice, this means: "Planning, management activities and monitoring of the attributes that make a forest management unit a HCVF should de designed, based on existing scientific and indigenous/traditional knowledge, to ensure that these attributes do not come under threat of significant reduction or loss of the attribute and that any threat of reduction or loss is detected long before the reduction becomes irreversible. Where a threat has been identified, early preventive action, including halting existing action, should be taken to avoid or minimise such a threat despite lack of full scientific certainty as to causes and effects of the threat" (FSC Principle 9 Advisory Panel, 2000).

The precautionary approach operates both when identifying HCVs and when managing already identified HCVFs, e.g.:

- **Assessing the presence of HCVs**: where doubt exists as to whether an attribute, or collection of attributes, are sufficient to signify HCVs, then the forest manager will treat these attributes as HCVs, until information proves otherwise. This should occur when the toolkit users and regional and national experts lack sufficient information to make an informed judgement. Examples of HCVF that might not appear valuable at first include fire damaged or logged areas that host important and endangered mega fauna species like tigers and orang-utan.

- **Managing and monitoring HCVFs**: where doubt exists as to the appropriate management of the HCVF, management should include applying treatments to the HCVF at a scale and intensity that does not threaten the HCV before applying the management more generally within the forest management unit.

The precautionary approach has been incorporated into the methodology for identifying HCVs and should also form an important basis for any management regime and monitoring programme. For example:

- Forest management practices are altered to include safeguards more stringent than those required by Indonesian forestry law. Within HCVFs, it may be necessary to reduce harvest intensities, create additional or larger conservation zones within production forest areas, and protect slopes not currently protected.
- Where a FMU contains a social or cultural HCV (eg where a community is dependant on water from a stream originating from the forest for daily drinking, cooking and bathing water), the part of the FMU that maintains that HCV is a HCVF. Any decisions on forest use will have to be made with genuine community input and may involve co-management and co-monitoring of production operations. These communities are not restricted to those within the FMU; they may be further downstream.
- If you are unsure whether a HCVF can be logged, even with a modified harvesting regime, or if it should be zoned as a conservation set-aside, put it into the set-aside until you have shown beyond doubt that the proposed harvesting regime will not harm the future of the forest. This will require detailed study of the area and development of location-specific management rules.

HCV1. Forest areas containing globally, regionally[1] or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia)

This HCV pertains to FMUs and any impacts of their operations. Operational impacts may affect forest, coastal, marine and other landscapes, whether protected or not.

In the Indonesian context this toolkit has identified the following components:

1.1 Protected Areas
1.2 Critically endangered species
1.3 Concentrations of endangered, threatened or endemic species

[1] Above the level of country, i.e. S.E. Asia

1.4 Critical temporal concentrations

HCV1.1 Protected areas

Rationale

Protected Areas are a vital component of biodiversity conservation. The network of marine and terrestrial "protected areas" within Indonesia includes:

- Gazetted protected areas
- Proposed protected areas already in a legislative process at any level of government
- *Hutan lindung* and other zones designated for any sort of protection by any government agency; these include but are not limited to, Man and Biosphere reserves, World Heritage Sites, RAMSAR sites

The size, distribution, condition and threats to protected areas will affect decisions on thresholds concerning other HCVs, as discussed later in this document.

All protected areas and proposed protected areas are considered HCVs.

Instructions to forest managers

Identification of HCV 1.1

Task	Guidance	Examples
Assess the presence of any gazetted or proposed protected areas that may be impacted by FMU operations. *(Appendix 1 provides a list of such areas, and forest managers should check to see if this needs to be updated)*	This information is available from: • RTRW and other available spatial plans • Ministry for Forestry, DG of Forest Protection and Nature Conservation • *Dinas Kehutanan* • Relevant conservation organisations If any are identified, follow the guidance below.	Examples of impacts from forest management can include: • Road erosion affecting a national park • Damage to coral reefs from siltation • Increasing risk of fire within the FMU and beyond • Drainage of adjacent swamp areas • Social impacts (e.g. increased access to forest areas and migration to areas near parks)

Management and monitoring for HCV 1.1

Activity	Guidance
Find the management restrictions that apply to protected areas as defined above and their buffer zones.	Collate data and define HCVs to be maintained or enhanced. Data should be gathered from: • RTRW • Ministry for Forestry, DG of Forest Protection and Nature Conservation • Dinas Kehutanan • *Balai Konservasi Sumber Daya Alam* (BKSDA) • *Bapedalda* • Protected area managers • Relevant conservation organisations
Find the values that the protected areas are set up to maintain and assess values the FMU has that are not maintained by the protected area.	
Ensure that no management practices within the FMU negatively impact upon the protected areas and proposed protected areas.	• Establish relationships with protected area managers who will jointly monitor for adverse impacts on protected area HCVs. • With protected area managers, define monitoring standard operating procedures and indicators to prevent negative impacts on protected area high conservation values by FMU operations. Examples would include affecting water quality or quality, disturbing wildlife migration routes, increasing fire risk.
Make periodic checks for the creation of new protected areas or new proposed protected areas that could potentially be impacted by the FMU.	(see above)

HCV1.2 Critically endangered species

Rationale

There are three categories of species that are relevant to this HCV:

1. Species of such global conservation importance that their presence alone would constitute a HCV. We consider that the presence within the FMU of any species that is listed as 'Critically Endangered' on the IUCN red data list (http://www.redlist.org) or listed in Appendix I of CITES constitutes a HCV. Where the presence of these species has not yet been determined, then if they potentially occur within the FMU then it will be assumed that they in fact do.
2. Species critically endangered yet little known or enigmatic, hence not included in the IUCN list although deserving of such attention.
3. Species that are threatened with local extirpation.

Any species listed as *critically endangered* by IUCN or on Appendix I of CITES that is actually or potentially present within the FMU is a HCV. Other species will be an HCV when identified as such by a consensus of influential stakeholders.

Instructions for forest managers

Identification of HCV 1.2

As part of forest management you will in any case need to conduct a biodiversity assessment that forms a species inventory (as required for FSC criterion 6.2). This information should also be analysed to determine whether the FMU contains any species that are so threatened that its presence alone would constitute a HCV.

Task	Guidance	Examples
Following assessment of rare, threatened and endangered species, check if any are from the IUCN critically endangered list or CITES Appendix I that are, or potentially are in the FMU.	Each species from the list identified as present is an HCV. Follow the guidance below.	• White winged wood duck in Sumatran peat swamps • Rhinoceros in Sumatra and Borneo
Periodic consultation with experts to assess potential presence of little known, yet critically endangered species.	Each species identified by experts as present is an HCV. Follow the guidance below.	
Expert and local stakeholder consultation and analysis to assess presence of locally critically endangered species. Determine if species are protected by special regional or district laws.	Each species identified by experts and stakeholders as present is an HCV. Follow the guidance below.	• Elephant in East Kalimantan • *Ramin* in South Kalimantan and Riau • Yellow Crested Cockatoo in Nusa Tenggara Timor

Management and monitoring of HCV 1.2

Activity	Guidance
For each HCV, identify key baseline information.	This should include: • Current status (population and distribution) • Main trends and threats • Management impacts All must be considered within the FMU in the context of wherever else the species occurs.

Draw up specific management proposals for each HCV.	Options include, but are not limited to: • Active management • Restoration measures • Strict protection For example, it may be appropriate to demarcate: Some key reserve areas • Areas that maintain landscape-level connectivity • Areas that ensure maintenance of certain stand-level habitat features, such as provision of standing deadwood or riparian zone protection Other options may arise in the context of the HCV being managed. Expert guidance may be needed.
Integrate the management proposals into the broader planning process.	Ensure that measures are actually implemented, for example through changing operational procedures and ensuring that a training programme has been completed to ensure those changes are followed through.
Develop monitoring indicators, a monitoring plan and implement it.	Examples of key monitoring indicators would include: • Specific wildlife population and distribution trends in the FMU • Maintenance of habitat extents, quality and connectivity • Pre-operational planning checks • Other quantitative data like records of hunting from forest guards The forest manager should be aware of changes to the level of landscape and national protection of the HCVs. Where the HCVs include samples of natural ecosystems within a substantially altered landscape, features that help to maintain those HCVs within the landscape (e.g. corridors and buffers) should be monitored.

HCV1.3 Concentrations of threatened or endangered or endemic species

Rationale

Concentrations of threatened or endangered species

This element of the HCVF requirements requires identification of forests that contain significant concentrations of rare and endangered species. Forests that contain concentrations of threatened or endangered species are clearly of greater priority for sensitive management and protection than those that do not. This is because endangering these forests automatically adds pressure to the species contained through habitat loss, poaching and crowding.

A forest containing a concentration of threatened of endangered species, as recognised by national and international experts, is a HCV.

Concentrations of endemic species

Endemic species are ones that are confined to a specific geographic area that may be large or small. Indonesia's forests are widely recognized as centres of endemism. For example, the Endemic Bird Area (EBA - produced by BirdLife International) and Conservation International Biodiversity Hotspots analyses list the Sundaland lowland and montane forests, Sulawesi lowland forests and the Western Java mountain forests are amongst the world's most important centres of endemism. Many endemic species are confined to particular islands or island groups.

A forest containing a concentration of endemic species, as recognised by national and international authorities is a HCV.

Instructions for forest managers

Identification of HCV 1.3

As part of forest management you should already have conducted a biodiversity assessment that forms a species inventory (as required for FSC criterion 6.2). This information should now be analysed to determine whether the FMU contains any species that are threatened, endangered or endemic.

Few FMUs in Indonesia are likely to represent a concentration of threatened & endangered, or endemic species by themselves; they will as part of a larger landscape.

A FMU may be a particularly important part of a landscape if it forms a junction between different sorts of habitats, for example, if a large area of limestone forest intersects with an alluvial plane.

Task	Guidance	Examples
Following assessment of threatened & endangered, or endemic species, check with relevant experts and	If the FMU is part of a landscape with concentrations of threatened or endangered	Concentrations of endemics include the Mentawai islands. Despite their small land area, the islands

conservation organisations whether the FMU is: • Part of a landscape with concentrations of threatened & endangered, or endemic species • Contains an area of particular importance to an overall landscape with threatened & endangered, or endemic species • Within an Endemic Bird Area (EBA)	species, the FMU should apply the precautionary principle and assume the FMU contains a concentration of these species, unless clearly demonstrated otherwise.	contain 14 mammals that occur nowhere else in the world An example of a concentration or rare, threatened and endangered species is the lowland forest of parts of northern East Kalimantan, which is known to host ten primate species, the highest primate diversity in Indonesia. EBAs are defined and mapped by BirdLife International (www.birdlife.net)

Management and monitoring of HCV 1.3

Activity	Guidance
For the HCV, identify key baseline information.	Parameters to be identified include, but are not limited to: • The role of the FMU in the landscape containing concentrations of rare & threatened, or endemic species • Management impacts Trends concerning these parameters should be considered in the context of both the FMU the landscape and the ecology of the species concerned.
Draw up specific management proposals for any part of the FMU that is identified as a critical part of the landscape containing concentrations of rare & threatened, or endemic species.	Options include, but are not limited to: • Active management • Restoration measures • Strict protection For example, it may be appropriate to demarcate: • Some key reserve areas • Areas that maintain landscape-level connectivity • Areas that ensure maintenance of certain stand-level habitat features, such as provision of standing deadwood or riparian zone protection Other options may arise in the context of the HCV being managed. Expert guidance

	may be needed.
Integrate the management proposals into the broader planning process.	Ensure that measures are actually implemented, for example through changing operational procedures and ensuring that a training programme has been completed to ensure those changes are followed through. Examples of beneficial operational changes include: • Modifying road network plans to avoid unnecessary disturbance of critical habitats • Reducing skidding damage to minimize impact on ground dwelling animals e.g. babblers, rodents and herpetofauna
Develop monitoring indicators, a monitoring plan and implement it.	Examples of key monitoring indicators would include: • Maintenance of landscape features that maintain or enhance populations of target species • Ecosystem representation data • Pre-operational planning checks The forest manager should be aware of changes to the level of landscape that affects the HCV. For example, if the wider landscape is being degraded, the value of the forest in the FMU maintaining this HCV is likely to rise and need closer management attention, and perhaps stricter protection.

HCV 1.4 Critical temporal concentrations

Rationale

This element is designed to ensure the maintenance of important concentrations of species that use any area of forest only at certain times or at certain phases of their life-history. It includes critical breeding sites, migration sites, migration routes or corridors (latitudinal as well as altitudinal).

An important temporal concentration could be represented by:

- Concentrations of migratory birds
- Animals such as bearded pig following Dipterocarp masting events.
- Fruit bats, bees and pigeons follow flowering and fruiting patterns of trees.
- Elephant migration between different forest blocks.
- Fish migrating to spawning grounds.

A globally significant concentration of migratory species or a nationally significant temporary concentration or migration route is a HCV.

Instructions for forest managers

The task of identifying this HCV into a preliminary assessment and a full assessment is divided. This is because most of the information necessary to decide whether a FMU potentially contains a 'significant temporal concentrations of species' HCV is information that the forest manager will require for other aspects of sustainable forest management and so is not an extra requirement of FSC Principle 9. For example, as part of forest management you should already be aware of the forest types that occur within the FMU as well as any exceptional habitat or landscape features within the FMU (for example as a requirement under Criteria 6.1, 6.2 and 6.4). This information is then used to determine whether the FMU contains any ecosystems that are likely to contain globally significant concentration of migratory birds (HCV 1.4.1) or a nationally significant concentration of species.

If the preliminary assessment indicates that a HCV may be present, then the forest manager will be required to conduct further work to establish whether or not the HCV is actually present. This is the 'full assessment'.

Preliminary assessment

Task	Guidance	Examples
1.4.1 Does the FMU contain extensive mangroves, freshwater swamp forest and peat swamp forest, riparian forest?	This information should be available from vegetation surveys or maps that the forest manager will require for other aspects of sustainable forest management. If the FMU does contain extensive areas of any of these forest types then go to full assessment.	Indonesia contains globally significant migration sites for Palaearctic migrant birds. These principally use mangroves, freshwater swamp forest, peat swamp forest and extensive riparian forest. Examples include: • All Indonesian mangrove forest, using the precautionary principle, unless demonstrated otherwise • Berbak, South Sumatra • Middle Mahakam Lakes Area, East Kalimantan
1.4.2 Does the FMU include any landscape features that tend to lead to a concentration of animals?	This information can be obtained through a combination of local knowledge, tree species inventory and habitat survey. It is likely that the forest manager will have conducted most of these as	If the FMU does contain extensive areas of any of these forest types then go to full assessment. • Salt licks • High concentrations of strangler figs • Elephant migration

	part of the sustainable forest management program. Particular emphasis should be placed on local knowledge – the forest manager should talk to local villagers and others and record these discussions.	corridors Examples include: • Gunung Palung National Park (West Kalimantan) and Ketambe Gunung Leuser (Sumatra) have notable concentrations of strangling figs and consequently exceptional concentrations of frugivorous species (primates, fruit pigeons, bats). • Sipurak geographic area Jambi (Sumatra) contains concentrations of salt licks that are a critical resource for many animals in Kerinci Seblat National Park (elephant, tapir etc). The importance of this site has been formally recognised as the government has already proposed this as a protected area.

Full assessment

Task	Guidance	Examples
1.4.1 Your biodiversity assessment should include survey for concentrations of migratory birds. Check whether your FMU is within or contains an Important Bird Area (IBA)	If you, or a contractor, are conducting a biodiversity assessment, then this must include one or more specific activities aimed at establishing whether there is a concentration of Palaearctic migratory bird species within the indicated forest types. The survey should: • establish when the forest type(s) are likely to be used by	IBAs are defined and mapped by BirdLife International (www.birdlife.org)

	migratory birds (with the aid of both expert and local knowledge) • conduct one or more field surveys to identify the migratory birds present • the field survey should use the best scientific methods (expert assistance may be needed) • both the number of species and the population densities should be estimated • the report of the survey should include a full description of the methods (with justifications) as well as the findings If a concentration of Palaearctic migrants is found, the forest manager should contact relevant authorities (see appendix 5) to determine whether this constitutes a globally significant concentration.	
1.4.2 If the FMU contains any salt licks, areas recognised as being occasional yet critical feeding areas, then the forest manager will need to do employ an expert to conduct surveys looking for temporal concentrations of species.	The expert report will make a recommendation as to whether any concentration is significant (local and indigenous knowledge will be important to inform this decision).	For example, a significant concentration at a salt lick would include many different taxa, or might also include a large proportion of the local population of one species.

Management and monitoring of HCV 1.4

Activity	Guidance
Describe and delineate the HCV.	The forest manager is responsible for clearly describing the HCV. For example, 'the forest contains two salt licks that are used by at least x species including a large proportion of the provincial populations of

	species y and z' The forest manager would be expected to produce maps of where the forest type or habitat features occur and delineate the areas on the ground.
For each HCV, identify key baseline information.	This should include: • the importance (global, provincial, local etc) of the temporal concentration • current status of important species that comprise the concentration • main trends and threats to the maintenance of the forest type or habitat feature that contains the HCV • potential management impacts on the forest type or habitat feature that contains the HCV
Draw up specific management proposals for each HCV.	This may include active management, restoration measures or strict protection as appropriate. For example, it may be appropriate to define some key reserve areas, maintain landscape-level connectivity, and/or ensure maintenance of certain stand-level habitat features, such as canopy cover.
Integrate the management proposals into the broader planning process.	Ensure that measures are actually implemented, for example through changing operational procedures and ensuring that a training programme has been completed.
Develop monitoring indicators, a monitoring plan and implement it.	Examples of key monitoring activies would include: • Specific wildlife population trends • Habitat quality survey results • Local people's perceptions of the changes to the status of the species. • Pre-operational planning checks • Other quantitative data such as hunting records from forest guards. Where the HCVs include samples of natural ecosystems within a substantially altered landscape, features that help to maintain those HCVs within the landscape (e.g. corridors and buffers) should be monitored.

HCV2. Forest areas containing globally, regionally, or nationally significant large landscape level forests, contained within, or containing the management unit, where viable population of most if not all naturally occurring species exist in natural patterns or distribution and abundance.

In Indonesia there is a relative paucity of data on population distribution and genetics for almost all species. Therefore this HCV should be considered in two parts. The first pertains to remaining forest in relation to the island it sits on. The second pertains to viable populations; it is believed that conservation of large blocks of habitat retain species in viable numbers.

Rationale

Forests that contain viable populations of most or all native species will be large in size, and relatively unaffected by recent human disturbance and fragmentation.

In the Indonesian context this toolkit has identified the following components:

2.1 FMU is a large level landscape forest
2.2 FMU is an integral part of a large level landscape forest
2.3 The FMU maintains viable populations of most naturally occurring species

HCV2.1 FMU is a large level landscape forest

Rationale

This HCV pertains to an FMU that comprises a large level landscape forest in its own right. Examples of large landscape level forest include, but are not limited to:

- A forest of an entire island
- A significant proportion of the remaining forest of a large island that holds together as a reasonably unfragmented block

A FMU which is a large landscape forest is considered HCV.

Instructions for forest managers

Identification of HCV 2.1

Task	Guidance	Examples
Determine the extent of remaining forest on the island, and that which the	• CITRA Landsat Image (or other remotely sensed	Information may be sought from: • BAKOSURTANAL and

FMU represents.	imagery of forest area) based GIS • Use relevant reports from forest conservation organizations, donors and government agencies like *Dinas Kehutanan*, *BAPPEDA*	others • World Bank/GOI reports on remaining forest in Indonesia • Global Forest Watch forest-cover maps • Ministry of Forestry Maps
Determine whether the FMU now comprises a large landscape level forest.	• Seek expert advice	As general guidelines, a concession on a large island like Sumatra or Borneo that forms a reasonably unfragmented block of around 50,000 ha is likely to be considered by informed stakeholders as a landscape level forest. On smaller islands such as Seram this figure is likely to be lower.

Management and monitoring of HCV 2.1

Activity	Guidance
Manager should ensure the FMU maintains forest cover and that fragmentation is minimised.	• Plan roads and infrastructure to maintain landscape integrity • Use RIL • Minimise external threats like fire
Managers must do an evaluation of the forest cover in their FMU, with respects to the level of degradation (road density versus canopy density), which should be mapped. Based on relationships of forest cover (of less degraded quality).	Regularly update satellite imagery and use GIS to: • Monitor distribution and quality of forest types – ground-truth assumptions • Review impacts of road development • Review impacts of external threats such as fire
Work with local stakeholders, including communities, to maintain forest integrity.	Consultations with communities and relevant authorities to ensure all are informed about the activities of each, and work to mitigate potential future threats such as illegal logging, wildcat mining, and unsustainable agriculture.

HCV2.2 FMU is an integral part of a large level landscape forest

Rationale

If the analysis of HCV 2.1 does not show the FMU to be a large landscape level forest on its own, it may still form an integral part of one. If the FMU is lost, the large landscape level forest is seriously affected.

A FMU which is an integral part of a large landscape forest is considered a HCV.

Instructions for forest managers

This guidance should follow the HCV 2.1 analysis.

Identification of HCV 2.2

Task	Guidance	Examples
Determine the extent and condition of forest surrounding the FMU.	• CITRA Landsat Image (or other remotely sensed imagery of forest area) based GIS • Use relevant reports from forest conservation organizations, donors and government agencies *like Dinas Kehutanan*, *BAPPEDA*, *BAPLAN*, Ministry of Forestry	• Information may be sought from BAKOSURTANAL and others • Global Forest Watch forest-cover maps • In KALTIM the TNC ecoregion plan; in Riau and West Papua, forestry data from WWF
Determine whether the loss or severe degradation of the FMU will significantly impact the large landscape level forest.	• Look at loss of forest surrounding the large landscape block remaining and determine what caused it. Assess remaining risks and any role the FMU would have in exacerbating them. • For small FMUs, check to see whether the forest it contains serves as a corridor or other link between large forest blocks, protected areas etc. • Seek advice from stakeholders in the	• A 250,000 ha FMU in a larger forested landscape would be both a large landscape level forest and also one whose loss, or severe degradation, might seriously affect a landscape of several million ha. • A 20,000 ha FMU may possibly not be a large level landscape level forest, yet its loss could seriously impact a 100,000 ha area. • A small FMU may

	forest and conservation community	form an important corridor function between two or more large forest blocks.

Management and monitoring of HCV 2.2

Activity	Guidance
Managers must do an evaluation of the forest cover in their FMU, with respects to the level of degradation (road density versus canopy density), which should be mapped, based on relationships of forest cover (of less degraded quality).	Regularly update satellite imagery and use GIS information to then: • Monitor distribution and quality of forest types – ground truth assumptions • Review impacts of road development • Review impacts of external threats such as fire
Manager should ensure the FMU maintains forest cover and that fragmentation is minimised.	• Plan roads and infrastructure to maintain landscape integrity • Use RIL • Minimise external threats like fire
Management must take into consideration the role that their FMU can have with respect to maintaining forest cover across the landscape.	
Work with local stakeholders, including communities, to maintain forest integrity.	Consultations with communities and relevant authorities to ensure all are informed about the activities of each, and work to mitigate potential future threats such as illegal logging, wildcat mining, and unsustainable agriculture.

HCV2.3 The FMU maintains viable populations of most naturally occurring species

Rationale

Forests that contain viable populations of most species are assumed to be likely to survive as an intact ecosystem in perpetuity if undisturbed. Yet most FMU managers are likely to filter "most species" from the "most known species" with special emphasis on charismatic megafauna. In reality, however, the bulk of species that is relatively or completely unknown such as insects, algae and fungi and will be overlooked. Here we assume that the use of proxies like umbrella species (species with known ecological requirements that can be used to indicate habitat condition) and others that are relatively well known will serve to indicate the heath and status of viable populations of others, and that maintenance of habitats (and the monitoring of their health) will do the same.

Although these proxies may not be scientifically rigorous, they are the best available first steps and can be amended in the light of new, species specific, information as it emerges.

A FMU which contains viable populations of most naturally occurring species is a HCV.

Instructions for forest managers

Identification of HCV 2.3

Task	Guidance	Examples
Select potential umbrella species and assess whether the FMU contains viable populations In the absence of information indicating potential umbrella species, or in conjunction with them, look at extent and condition of forest types and ecological gradients in the FMU that may maintain them and seek expert opinion on whether the FMU is large enough to support them.	• Relevant authorities (see appendix 5) • Vegetation maps • Topographic and geological maps • Note that in practise, many species of charismatic megafauna are very rare and therefore it becomes difficult to get sufficient data to be reliable about trends in their populations. Using a combination of species with large habitat requirements or groups of species may therefore be most effective.	Umbrella species: • Rhinoceros • Top predators • Primates Maps: • RePPPRoT • BAKOSURTANAL sources

Management and monitoring of HCV 2.3

Activity	Guidance
Monitor health of forest types and levels of disturbance likely to affect viable populations of species.	Regularly update satellite imagery and use GIS information to then: • Monitor distribution and quality of forest types – ground truth assumptions • Review impacts of road development • Review impacts of external threats such as fire
Monitor new information about umbrella species, and others, that could be used in the context of FMU management	Consult relevant authorities, especially when there is a lack of in-house expertise.
When umbrella species are identified, monitor the health and well-being of population viability with the FMU and wider landscape.	Develop standard operating procedures for monitoring.

HCV3. Forest areas that are in or contain rare, threatened or endangered ecosystems

Rationale

HCV3 focuses on ecosystems, which the forest manager should interpret as broad forest types. Some broad forest types are naturally rare in some regions or particular islands in Indonesia. Heath forests, for example, are limited in extent because they depend in large part on the location of fossil beach sites and favourable climatic or geological conditions to allow their development and persistence. Recent processes, such as land conversion may have further decreased their extent.

Other broad forest types have become rare through multiple recent threats, such as logging, wildfires and agriculture conversion.

This HCV is designed to ensure that threatened or endangered forest types are conserved. These particularly include forest types which were previously widespread or typical of a much larger region. They also include rare forest types, such as some of the limestone forests and Freshwater Swamp Forests.

HCV 3 Forest areas that are in or contain rare, threatened or endangered ecosystems

The forest areas to be considered include, but are not limited to:

- Cloud forest
- Upper montane forest
- Lower montane rain forest
- Lowland forest
- Peat swamp forest
- Freshwater swamp forest
- Heath forest
- Savannah
- Limestone forest
- Mangrove

In some parts of Indonesia it maybe appropriate to further subdivide, or add to, the above categories. Additions could include unusual species assemblages.

If more of these habitats are cleared **outside** the FMU, the importance of these ecosystems **inside** the FMU increases, which means that they will need more carefull management, or perhaps protection. It is therefore in the interest of FMU managers to both monitor what is happening to the ecosystems they manage in the wider landscape, and to help mitigate the threats they are under.

Where an FMU contains significant size of these rare, threatened and endangered forest types and has been identified as a conservation priority area by an independent organization, then the forest types is an HCV. Further, rare, threatened and endangered ecosystems that are located outside the FMU that are impacted heavily by FMU activities is also an HCV.

Instructions for forest managers

As part of the requirements of Principle 6, you should already know which forest types are present within the FMU.

Identification of HCV 3

Tasks	Guidance	Examples
Identify the extent and quality of habitats found on the island in which the FMU is located.	Use maps and literature to identify the natural extent of habitats.	
Identify the forest types present within the FMU (guided by those indicated in appendix 2) and if these are rare, threatened or endangered in the wider landscape.	Consult existing maps of the forest types within the FMU and look at their size and integrity in both the wider landscape and across Indonesia. Consult with conservation experts and institutions to identify those habitats recognised as rare, threatened or endangered.	Using the forest types provided above, examples of rare, threatened and endangered forest types that have already been recognised as threatened across Indonesia are: • All forest below 1000 m in western and central Indonesia is considered threatened (Holmes, 2000); • Limestone forest throughout Indonesia; • Cloud forest • Heath forest • Mangroves
Overlay the FMU forest type map with maps of areas identified as important for conservation.	If the rare, threatened, endangered forest types within the overlap any of the areas identified by these strategic conservation plans, then the rare, threatened or endangered forest type will be a HCV. There may be cases where conservation plans do not reflect current forest condition, threats, and trends. Experts should be consulted to identify if there are gaps in these plans and if the FMU should be considered critical to the protection of the ecosystem type.	Conservation priority areas may include: • Indonesian Biodiversity Strategic Action Plan • Regional l committees responsible for producing the Bioregional priories of IBSAP • Existing National Conservation Plan. • Existing ecoregional plans (e.g. TNC for East Kalimantan, CI plan for West Papua)

Management and monitoring of HCV 3

Activity	Guidance
Define the distribution of forest types within your FMU.	Ground vegetation survey and GIS mapping of forest types.
Determine the condition of the forest type.	Ground inspection for canopy cover, gap frequency, fragmentation levels, basal area, etc. and/or remote sensing interpretation.
Identify the threats to these HCV forest types and how severe they are, and identify management steps required to abate them.	Utilise appropriate and available analytical tools where appropriate. Conservation organizations may be contacted for advice.
Devise and implement a monitoring programme for each forest type.	Establish a monitoring process with standard operating procedures that include clear indicators relevant to the goals of management. This may be more than annual if a finer temporal sampling is required, e.g., important events that may appear in the FMU during specific months only. Consultation with relevant experts may be necessary.

HCV4. Forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control)

This HCV pertains to important functions that maintenance of forest has. Identified HCV components are:

4.1 Unique sources of water for daily use
4.2 Forests critical to water catchments and erosion control
4.3 Forest providing a barrier to the spread of fire
4.4 Forest with critical impact on agriculture and aquaculture

HCV4.1 Unique sources water for daily use

Rationale

Many forests provide drinking water to communities or other settlements. This might include streams or rivers, lakes, springs or wells. Where the forest protects and maintains water supplies for people or communities who have no alternative sources of drinking water, then this will always be critical. HCVF local groups should note that this element can alternatively be dealt with under HCV5. Typically, these water sources will

also be used by the communities for other essential daily needs such as cooking, bathing and washing.

Where forests provide the only source of water for daily use to a community, then it is recommended that this will always be a HCV. The forest does not have the attributes of HCV 4.1 if the communities have access to a ready replacement source of water not influenced by the forest in the FMU, and that can meet their needs in a reliable way throughout the year and at an acceptable cost.

Instructions for forest managers

Identification of HCV 4.1

Task	Guidance
Identify specific areas within the FMU that provide drinking water (and other daily water needs) to communities.	Identify local communities within and surrounding the FMU. Consult with local communities to identify critical locations of springs, headwaters, and other sources of drinking/daily water. Note: All riparian buffer zones should be protected by Indonesian law. Sources of Information include maps or information on critical drinking water supplies, including: • Hydrology and/or River/Drainage pattern maps are available from *Badan Pengelolaan* DAS • DRKT (*Departemen Kehutanan*) • *Peta Sumber Mata* Air from PDAM • *PU-Pengairan – BAPPEDALDA* • TGHK • BAPLAN • Remote sensed imagery and/or topographic map • Consultations with local communities • Field Surveys
Identify whether the communities have access to alternative sources of water that is not dependent on the FMU (for example piped network bringing water sourced from outside the FMU). Check whether this access is available all year long and at an acceptable cost and conditions.	Managers may want to consider using a TNC Site Conservation Planning Methodology (SCP) or Participatory Conservation Planning (PCP) that can be conducted with the communities.

Management and monitoring OF HCV 4.1

Activity	Guidance
Identify and map the location of important water resources, as well as the level of protection that is provided. Identify the water catchment area which is the source of the water used by the community, and determine whether it is partly or wholly within the FMU. Identify whether the quality and quantity of these sources of water is affected by the forest cover within the FMU.	Consult closely with communities to identify important water source locations in the FMU. Managers will need to conduct a needs analysis (possibly in conjunction with HCV6) of important sources of water. Typical examples include: • Rivers and streams flowing from or through the forest area (Note: All riparian buffer zones should be protected by Indonesian law). • Springs located in the forest or affected by the forest area, used directly or through a piped network • Wells and boreholes located in the forest, or deriving their water from a water table which level is affected by the forest
Identify if these water sources are threatened.	Manager may want to consider using a TNC Site Conservation Planning Methodology (SCP) or Participatory Conservation Planning (PCP) that can be conducted with the communities.
Development management plans or guidelines to reduce or avoid identified threats to important water resources.	Manager will need to conduct a needs analysis (possibly in conjunction with HCV5) of important sources of water.
Establish a water monitoring process with the active participation of the communities.	The water monitoring process should use simple visual methods that can be used in cooperation with the local communities. Examples include: • Visual measurement of the level of a river or well at a given location, chosen with the community • Visual appreciation of the turbidity of a river by using a stick with measurement marks that can be put into the river to measure the visibility within the water as a proxy for turbidity. The FMU can identify in each community a person in charge of recording the quantity and quality of the river and putting the records on a visible billboard in a village hall or other public meeting place. Additional methods requiring sophisticated instrumentation can be used if necessary to record other parameters if needed (chemical parameters for example), based on the needs analysis and the analysis of

	threats. For example, if mercury is considered a threat in the area, then specific measurements can be planned.

HCV4.2 Forests critical to water catchments & erosion control

Rationale

The soil types of tropical rain forests in Indonesia are dominated by red-yellow podzolic (acrisols), which are highly vulnerable to erosion. Further characteristics of these forests, including high rainfall, hilly/mountainous landscapes and fast flowing streams and rivers, also lead to levels of natural erosion. All areas suffer some degree of erosion and many are also prone to a degree of terrain instability, but often the extent is very low and/or the consequences minor.

Forests are important in maintaining terrain stability, to control excessive erosion which can lead to landslides and serious siltation. Thus, most forests play an important role in preventing flooding, controlling stream flow regulation and water quality.

Where a forest area constitutes a large proportion of a water catchment then it is able to play a critical role in maintaining water quantity and quality. The greater the importance of the water catchment, in terms of flooding or drought risk or water usage, the more likely it is that the forest is critical to maintaining these services and more likely that the forest is a HCVF. In some cases, forests protect against erosion and landslides in areas where the consequences, in terms of loss of productive land, damage to ecosystems, property or loss of human life, are severe. In these cases, the ecosystem service provided by the forest is critical, and it is these that should be considered HCVs.

In Indonesia, all protected forests, DAS *Super-Prioritas* and DAS *Prioritas* areas, other significant DAS and Sub-DAS areas designated by relevant experts, as well as cloud forests, will be considered HCVs.

Instructions for forest managers

Identification of HCVS 4.2

Task	Guidance
Identify if FMU is within the classified DAS *Super-Prioritas* and DAS *Prioritas*, or other important DAS and Sub-DAS areas.	Sources of information: • Director General Decree of Reforestation and Land Rehabilitation, Ministry of Forestry RI No. 128/Kpts/V/1997 about Criteria in Determining of DAS Priority (Keputusan Direktur Jenderal Reboisasi dan Rehabilitasi Lahan No. 128/Kpts/V/1997 tentang Kriteria Penetapan Urutan Prioritas DAS). • DAS Super-Prioritas and DAS Prioritas (Menteri Kehutanaan) tipologi map. There is a generic

	guideline for each one of these. Manager will need to use FMU maps and ground truthing to identify other important DAS and Sub-Das areas
Identify if FMU includes designated protection forest.	Source of information: • TGHK Map (*Tata Guna Hutan Kesepakatan*/Forest Land Use Agreement)
Identify presence of 'cloud forest' catchment function of forests on mountains and ridges, particularly those close to the sea.	Sources of information: • Land Cover/Vegetation Map and Topographical Maps developed by Forest Managers • Aerial Photography
Identify other important DAS and Sub-Das areas in the FMU.	Manager should check with government agencies and relevant experts to identify other critical areas.

Management and monitoring of HCVS 4.2

Activity	Guidance
Map the locations of DAS *Super-Prioritas* and Das *Prioritas*, or other important DAS and Sub DAS areas within the FMU. Ground check to ensure accuracy of mapping information.	See appropriate maps and criteria from Director General Decree of Reforestation and Land Rehabilitation, Ministry of Forestry RI No. 128/Kpts/V/1997.
Water protection forest is identified and delineated in the field. Ground check to ensure accuracy of protected forests maps.	Mapping protected forests should utilise information from *Dinas Kehutanan* and *Bappeda.*
Identify all cloud forests, including those occurring at altitudes of less than 2000 m. Map all cloud forest areas in need of protection. Ground check to ensure accuracy of mapping information.	
Establish a water monitoring process to evaluate flow in the identified rivers. Establish SPAS to monitor and evaluate flow of river water and sample water quality (e.g. suspended sediment load). Determining discharge of river water flow (Q in m3/sec) and concentration of suspended sediment load (Cs in mg/l) periodically in around the SPAS station.	Source of information: • Director General Decree of Reforestation and Land Rehabilitation, Ministry of Forestry RI No. 058/Kpts/V/1995 about Guidelines for establishing SPAS in area of FMU, Jakarta, 1995 (Keputusan Direktur Jenderal Reboisasi dan Rehabilitasi Lahan No. 058/Kpts/V/1995 tentang Pedoman Pembangunan SPAS di Areal Pengusahaan Hutan, Jakarta, 1995).
Determining category of Water Regime	Category of Water Regime Index (WRI) is

Index and concentration of suspended sediment load as part of monitoring program.	determined by comparing Qmax and Qmin periodically, by using criteria as follows: 1.00 < WRI < 1.25: very good category 1.25 < WRI < 1.66 : good category 1.66 < WRI < 2.50 : moderate category 2.50 < WRI < 5 : bad category WRI > 5 : very bad category (Manual of Water Quality, BAPEDAL Indonesia) Category of concentration of suspended sediment load (Cs) in average periodically, by using criteria as follows: Cs < 100 mg/l: good category 100 < Cs < 250 mg/l : moderate category 250 < Cs < 500 mg/l: bad category Cs ? 500 mg/l : very bad category (Manual of Water Quality, BAPEDAL Indonesia)
Determining category of Erosion Danger Index (EDI) as part of monitoring program.	Category of Erosion Danger Index (EDI), by using criteria as follows: EDI < 1 : low category 1 < EDI < 4 : moderate category 4 < EDI < 10 : high category EDI > 10 : very high category
Development management plans or guidelines to (1) restrict harvesting in watershed protection areas and (2) rehabilitate degraded and other areas at risk of erosion areas and/or where monitoring shows excessive erosion levels.	Identify and map roads, skid trails, and log yards for rehabilitation Sources of information: • ITT Post-Harvest Maps • Guidelines for Implementing Reduced Impact Logging (RIL), Dept. Kehutanan dan Perkebunan, Jakarta, 1998; • RIL Guidelines for Lowland and Hill Dipterocarp Forest in Indonesia. Bulungan Research Report Series No. 1, Center for International Forestry Research, 1998; • Reforestation and Land Rehabilitation Guidelines (RLKT, Dept. Kehutanan).

HCV4.3 Forests providing critical barriers to destructive fire

Rationale

Since the 1980's fire has had a serious and continuing impact on the forest of Indonesia. These have been particularly evident on Sumatra and Borneo, especially in El Nino years. It is recognized as important that large landscape level forests be protected from further fire damage. An FMU in a key position can prevent fire spreading to other areas. This is particularly important if the firewall prevents ignition of degraded and other lands that may otherwise be susceptible to fire.

Uncontrolled fires of vast magnitude have caused considerable losses of vegetation cover in Indonesia, most of it secondary forest, but also primary forest. Most of them originate from fires lit for the purpose of land clearing or other human uses such as camps, and later spread to man-made and natural vegetation. Large areas of degraded vegetation such as heavily logged forest with large opened areas and lots of dry wood left behind are especially prone to the spreading of fires. Young plantations with an open cover and secondary forms of vegetations such as bush and grasslands (especially alang-alang (*Imperata cylindrica*)) are also very prone to fire. On the contrary, high-volume forest areas with dense vegetation and a high level of moisture tend to slow down the spreading of fires. In fact, such forests rarely catch fire, unless exceptional conditions are met, such as the proximity of an exceptionally large fire creating a change in local temperature, moisture and winds, exceptionally dry conditions following a long dry season such as those occurring during ENSO years, or local conditions that ease the spread of fire such as steep slopes or strong winds.

Hence, large areas of high-volume forest areas with dense vegetation and a high level of moisture close to degraded vegetation areas should be considered as a barrier to destructive fires and maintained as such.

Any forest boundary that protects against large scale fire is a HCV.

Instructions for forest managers

Identification of HCV 4.3

Preliminary task	Guidance
Identify fire expertise relevant to your island and obtain information on fire history, causes and forecasts.	• Contact relevant authorities such as CIFOR and *Dinas Kehutanan* • Review satellite images relevant to the wider landscape • Look at relevant web site links – for East Kalimantan - http://www.mdp.co.id/ffpcp/daily_fire_map.htm
Determine whether or not there has been a history of large-scale fires near or bordering the FMU.	

Management and monitoring for HCV 4.3

Activity	Guidance
Ensure integrity of forest toward fire threat.	Forests that are fragmented, with open canopies, or have experienced high harvesting intensities are more prone to fire damage. Strategies should be developed that try to ensure that these conditions do not occur (e.g. buffer zones and reduced-impact logging techniques).
Develop plans for fire-fighting.	Prepare standard operating procedures for fire fighting and train staff.

HCV4.4 Forest areas with critical impact on agriculture, aquaculture, and fisheries

Rationale

Where forest areas are close to agricultural land and fisheries, these effects can sometimes be critical to maintaining production. The effect of forest on maintaining production will vary according to climate and topography, spatial configuration of agricultural land and forest as well as crop types. The consequences of loss of agricultural and aquaculture production will also vary depending on the social and economic circumstances, with, for example, subsistence agriculturalists being particularly vulnerable to any loss of production. *This element of HCV4 aims to identify forests that are critical to maintaining the services that agricultural production depends upon.*

Where forest areas are close to agricultural land, fisheries and tourist areas, these effects can sometimes be critical to maintaining production and economic activity. The effect of forest will vary according to climate and topography, spatial configuration of agricultural land and forest as well as crop types. The consequences of loss of agricultural, aquaculture, fish production and tourism income will also vary depending on the social and economic circumstances, with, for example, subsistence agriculturalists being particularly vulnerable to any loss of production.

Below is a list of critical impacts of forest on agriculture, fisheries and tourism that have been found in various areas of Indonesia:

1. All mangrove forests in Indonesia would provide a critical role in protecting agricultural and aquaculture protection.
2. Forests have an impact on microclimate and wind. Low impact logging activities or collection of NTFPs will usually not significantly change this function. However, clear-cutting and conversion, especially on a large-scale, will in most cases affect micro-climatic conditions in ways that are likely to impact agriculture.
3. Forests provide habitat and food for a number of species that would otherwise attack crops, hence forests shelter agriculture from these potential pests. Intensive logging activities or conversion will push these species out of the forest, resulting in an increase in pest attacks than can significantly impact the sustainability of neighbouring crops. Examples commonly found in Indonesia include attacks of food crops and plantations by elephants, boars, deer, monkeys and tapir.
4. Forests can also provide habitat for animals that have a beneficial role in crop production, such as insects, birds or fruit bats that play a role in pollination. A degradation of the forest may then reduce the crops productivity. This is especially true of fruit-bearing crops.
5. The quality of forest cover also affects the quality and quantity of waters in rivers and coastal areas, which will affect aquaculture and fishing.
6. Mangrove and other coastal forest types provide a protection to coastal areas and to their uses by agriculture, aquaculture and tourism infrastructures.
7. In some cases, particular forest types may provide key habitat for fished or pond species at key elements of their cycle. For example in mangrove areas, some fishes need to take shelter under the roots of specific trees in some critical periods when water is low. Low-intensity shrimp pond managers collect shrimp larvae in natural mangroves to start breeding cycles.

Any forest that has a critical impact on the forest services that agriculture or aquaculture are dependent upon is a HCVF.

Instructions for forest managers

Identification of HCV 4.4

Preliminary Assessment

Task	Guidance
Identify the extent of mangrove. Identify communities within or nearby the FMU that are partly or fully dependent on agriculture, aquaculture, fisheries or tourism that depends upon mangrove.	Sources of information: • Contact relevant authorities (see appendix 5) • Review satellite images relevant to the wider landscape • Social research and studies, Village development (PMDH) reports, land use maps • Maps of mangrove forest areas occurring within the concession. • Consultation with the communities within and around the FMU.

Full Assessment

Task	Guidance
For each community that is partly or fully dependant on agriculture, aquaculture or fisheries, identify how the forest impacts the level of net productivity (i.e. the level of output and the level of work or investments and inputs needed to reach this output).	A degradation of the forest in terms of density of cover, disturbance of habitat of key animals, destruction of key vegetable species, may impact local agriculture and fisheries either by reducing output levels (lower crops or fish catches for example), or by increasing input levels (for example people may have to erect fences to protect their crops from pests, which requires additional labour and materials). Both have a negative impact on net productivity. Impacts of the forest on agricultural production and fisheries are usually only known once damage has occurred. Hence the best sources of information will be the communities located near the most degraded zones. If the FMU is still intact, comparative studies could be conducted with communities living in degraded zones of similar types of forests. In all cases, apply a precautionary approach. Detailed consultations with the people will be needed to determine:

	• Whether there is a trend of decreasing levels of harvest of crops or fish in areas close to or downstream forest management operations • Whether there are trends of increased levels of pests in areas close to forest management operations • What are the perceived causes of these trends Consultations with experts may also be needed to gather additional information on: • The main pests affecting local agriculture and whether there is a trend of an increase in pests when the forest is disturbed. • Key pollination insects, birds and bats and determine whether their lifecycle is depending on the forest. • Key fished species and the degree to which their lifecycle is affected by the forest cover.

Management and monitoring for HCV 4.4

Activity	Guidance
Assess existence of any threats to key forest services from FMU operations and take mitigation measures.	After assessment of internal FMU operations and their impacts, consult with communities and relevant authorities to inform how external activities affects critical forest areas, and work to mitigate potential future threats.
After assessment of external threats, develop partnerships to mitigate them.	
If damage to forest areas is sufficiently large that they will not recover alone, develop rehabilitation measures.	
Monitor ongoing health of critical forest areas.	Use updated satellite imagery and ground-truth.

HCV5 Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health)

Rationale

Many conservation designations view humans as purely prejudicial to forests. The definition of HCVFs is different because it recognises that some forests are essential to human well-being. This value is designed to protect the basic subsistence and security of local communities that are derived from forests - not only for "forest-dependent communities", but also for any communities that get substantial and irreplaceable amounts of income, food or other benefits from the forest.

HCV5 applies only to basic needs. For example, for a community that derives a large part its protein from hunting and fishing in forests where there is no alternative source of meat or fish, the forests would constitute a HCV. If, in another forest, people hunted largely for recreational purposes (even if they did eat their catch) and where they were not dependent upon hunting, then this would not constitute a HCV.

A forest may have HCV status if local communities obtain essential fuel, food, fodder, medicines, or building materials from the forest, without readily available alternatives. In such cases, the High Conservation Value is specifically identified as one or more of these basic needs.

Employment, income and products are values that should be conserved if possible, without prejudice to other values and benefits. However, HCVs do not include excessive extraction, even when communities are currently economically dependent on it. Nor do they include the excessive application of traditional practices, when these are degrading or destroying the forests and the other values present in the forest.

The following would not be considered HCVs:

- Forests providing resources of minor importance to local communities.
- Forests that provide resources that could readily be obtained elsewhere or that could be replaced by affordable substitutes.
- Forests that provide resources that are extracted at unsustainable levels
- Forests that provide resources that are obtained in a way that threatens the maintenance of other HCVs.

Over time, a value may grow or decline, with changing community needs and changes in land use. A forest, which was previously only one of many sources of supply, may become the only, or basic fundamental source of fuel wood or other needs. Conversely, needs may decline and disappear with time.

In Indonesia, communities living in and around forest areas have a varying degree of dependency on forest resources depending on their origin, their history, the influence of external parties such as traders, companies or government, as well as their access to markets and agricultural technologies. Indigenous communities living in isolated areas usually have a high degree of dependency to the forest. However, even migrant communities may become dependant on the forest if they harvest timber or non-timber forest products, for example, as part of their livelihood.

Assessing the availability of alternative sources may be delicate. The presence of communication and market access is an important factor. Isolated communities are likely to have few market options and a reduced access to alternative technologies to replace their forest-dependant livelihood pattern. Communities with easy market access and easy communication with traders and government services may be in an easier position to shift to new livelihoods. However, this may be limited by access to land, technology and capital. This should be considered carefully, and the principle of precaution should be applied, i.e. when in doubt, assume that the people have no ready replacement.

Another delicate element to evaluate is the extent to which the use of the forest by the communities is sustainable and is compatible with the safeguard of other HCVs. As mentioned above, unsustainable levels of extractions cannot be considered as HCVs, as well as activities that threaten elements of HCVs 1 to 3, such as excessive hunting of endangered species. At some point, social scientists will then have to consult with ecological experts to determine these interactions.

Instructions for forest managers

Identification of HCV

This HCV is different from biological and environmental ones because ultimately its identification and its management participation of the local communities. The preliminary assessment identifies communities that live within the FMU, around the FMU, or other groups that are known to live/travel through forest areas in the region. If local or migratory communities exist within or around the FMU, then Toolkit users should conduct a full assessment for HCV5.

In the Indonesian context, the following resources may become HCVs depending on the level of dependency of the communities, the existence of ready replacements and the interaction with other HCVs:

- Food
    - Carbohydrates (rice, sago, tubers…)
    - animal protein (meat, fish)
    - fruits, vegetables
- Materials for housing, boats construction, furniture, household equipment, tools, clothing…
- Fuel wood
- Medicines
- Animal feeds/fodder (this is mostly in the arid parts of Indonesia such as East Nusa Tenggara)
- Water for drinking and daily needs (see HCV 4.1)
- Goods that can be traded for cash income, including timber and non-timber forest products such as hunted animals, *gaharu*, resins, latex, fruits, etc.
- Others as appropriate locally.

Some of these uses may contravene local laws (for example when people extract timber without an official permit) or contradict other HCVs (for example when people hunt protected species). At the stage of the identification/ preliminary assessment, the assessor must identify all the potential uses of forest resources in an inclusive manner, without prejudice of the legality and sustainability of these uses of the forest by the people.

Preliminary assessment

Preliminary Task	Guidance
Identify local communities living in and around forest areas (FMU) or local forest user groups.	Local communities are defined as (1) groups living in a certain location within or around forest areas or (2) those that are "local forest user groups". Local forest user groups are those regularly using forest and other areas within the FMU regularly or seasonally for basic needs (e.g. communities creating ladang far from communities). Sources of information: This can be primarily achieved with the existing documents required for HPH.

	• Concession Map (*Peta areal kerja*) • Community Maps (*Peta penyebaran kampung*) • Social Development Planning Maps (*Peta lampiran studi diagnostic HPH Bina Desa Hutan*) • Other maps from local government (*sumber peta/data lain*)
Identify migratory or "*peramu*" communities living or using forests within the FMU.	Sources of information: • Consultations with local communities (*Data primer hasil diskusi dengan masyarakat local*) • Information/Knowledge of Field Staff (*Informasi dari petugas lapangan FMU*) • Social, Economic, and Cultural Research conducted in your region. A list of relevant research is included in the appendix of this report. (*Hasil penelitian penelitian yang dilakukan di areal kerja FMU atau sumberlainnya*)

If communities exist with or near the forest area or local forest user groups or migratory communities utilize the forest area, then the toolkit user must conduct a full assessment to determine whether this HCV is relevant.

Full assessment

Full Assessment of this HCV will always require consultation. Having established that the community uses the forest to fulfil some needs, the Full Assessment determines whether a forest is fundamental to meeting any basic needs. The way that this will be done will be enormously variable, depending on the socio-economic context and the need. Sometimes the forest manager will need to seek guidance from social scientists that specialise in the region. However, it will always involve consultation with the community itself, which is described in the Appendix.

Step 1: Identifying sub-groups in each village based on their livelihood pattern

Villages in Indonesia may comprise several sub-groups with different ethnic origins and livelihood patterns. Before starting identifying the importance of each value, the interviewers need to make a classification of each village in sub-groups according to their livelihood pattern, as in the following table. This information can normally be obtained from the village leaders or other key informants.

Table 1 – Identification of sub-groups within one village community

#	Ethnic group/origin	Main sources of livelihood	Other key characteristic (i.e. date of arrival, location of	Approximate # of Households	% of village population

			dwelling, etc.)		

Any group which belongs to Indigenous people groups and/or represents at least 15% of the village population should be considered as a significant sub-group and should be interviewed separately – either through individual interviews or through group interviews in which care is taken to make sure that only one sub-group is represented.

STEP 2: Identify how each sub-group meets their basic needs

For each sub-group, the following table is proposed as a guide for individual or group interviews. The purpose of this table is to identify how each of the basic needs of the sub-group is met by different types of sources, including the forest and alternative sources such as agriculture, the sea, the market, or aid by the government, forest company development program or other third parties, such as NGOs.

This table was tested in several communities in East Kalimantan with different levels of dependency of the forest, and proved to be easy to understand, enabling a good, active participation of the people and a good group interaction. About one hour was usually enough to fill the table with a small group of participants (5 to 15). Local groups, however, are encouraged to design their own variations of this model depending on their habits and local conditions.

This table can be used in individual interviews. However, conducting such interviews can take a long time. It is more efficient in terms of time to use the table with small groups of villagers gathered for a group consultation. The ideal size would be between 5 to 15 people. Then this can be repeated with different small groups representing different sub-communities depending on ethnic group, livelihood pattern, age and gender.

Regarding gender, it is important to obtain the participation of women, since they usually have a different share in the resource use. Women may be more involved in the gathering of particular forest products, such as medicines, and may then have a different perspective on how fundamental they are. In Indonesia, mixed gender group discussions tend to be dominated by men. In order to get an appropriate representation of women's point of view, separate group discussions with women only can be organized.

Table 2 - Fulfilment of Basic Needs(see appendix for an example of a filled table)

Village:…….	**Sub-Group** (based on table 1):						
Needs	Sources						
	FOREST		Cultivation	Purchased	Aid	Other (ex: sea)	Explanation remarks
	FMU	Other					
Food: Carbohydrates (rice, sago…)							
animal protein (meat, fish)							
fruits, vegetables							

Village:…….			**Sub-Group** (based on table 1):				
Needs	Sources						
	FOREST		Cultivation	Purchased	Aid	Other (ex: sea)	Explanation remarks
	FMU	Other					
Materials: housing							
boats							
furniture, household equipt, tools…							
Fuel							
Medicines							
Animal Feeds							
Water for drinking and daily needs							
Cash income							
Others:							

Instructions for filling the table

The table can be reproduced on a large piece of paper and put on the wall of the house of shelter where the consultation is taking place. The facilitator then explains the purpose of the consultation and proceeds to ask villagers where they derive each of the main resources in the table below, and the respective importance of each source.

For example, the facilitator will start asking the community what is their staple food, i.e. their main source of carbohydrate such as rice. Then they will ask them where they obtain it. Villagers will usually list the most important source first, and then other sources. For each source (for example: shifting cultivation), the facilitator then asks the villagers whether they derive all their rice from this source (ranking: 4); most of their needs from it (ranking : 3), a significant part of their needs (2), only a tiny, marginal part of their needs (ranking : 1), or none at all (0).

In each cell, the facilitator then indicates its ranking from 0 to 4 as explained below, and list the corresponding resources, e.g. "river fish", "well", "rice", "rattan", etc. The determination of the importance of each source for each need is done using the following levels:

- 4 - Essential = 100% of a given need is fulfilled by one source (for example, if all the water used by the community comes from the forest's rivers, put "4 (all)" in the "forest" column in the "water" row).
- 3 – Critical = more than 50% of a given need is fulfilled by one source
- 2 - Important = between about 15% and 50%

- 1 - not important = less than 15%
- 0 – non existent = 0%

Not all the cells need to be filled, but at least all the ones with a value above 2 should be filled. Likewise, all cells in the column "forest" should be filled to make sure that the importance of the forest is carefully evaluated. Depending on the circumstances, the column "forest" can be split in two or not. If the group interviewed lives in the middle of the Forest Management Unit under evaluation, then everything they derive from the forest is likely to be from the FMU (unless they have migratory or hunting/ foraging patterns that go beyond the FMU's borders). If the community is near the border of the FMU or often moves beyond its borders, then it may be necessary to clarify which percentage of their resources they draw from the FMU and which ones from another forest.

It is important to realize that it is not necessary to ask the communities for percentages. If they are ready to give such percentages, they can be used to classify the importance of each resource in the categories 0 to 4 above. However, it should be remembered that communities are not used to keeping quantified records of their needs and resource uses, so percentage given during interviews can be very misleading. Rather than trying to obtain figures, which would require months of data collecting, it is recommended to base the identification of fundamental resources on the qualitative perception of the people, which will be a more adequate indicator.

The levels 0 to 4 above can easily be obtained during individual or group discussions. In ordinary Indonesian language, the following could be used by farmers to qualify the importance of a source to fulfill a particular need, for example the following questions can be asked:

For example, the following questions can be used to qualify the different levels:

"Do you get all your fruits from the forests or are there other sources?" → if the answer is "all" then the level is 4 for the forest in the line "fruits"

If there are other sources, like for example a garden, then the question can be asked as such:
"Do you get more fruits from the forest or from the garden?" → if the answer is "more from the forest", then the level is 3

If the answer is "more from the garden" then the following question can be asked:
"Do you get a significant portion of fruits from the forest or just very little, seldom, and not in an important way?" If the answer is "significant, rather important" *(lumayan, cukup penting)* then the answer is 2, if the answer is "marginal, occasional, or not important" *(sedikit sekali, jarang, tidak penting)* then the answer is 1.

Some resources may become critical only at certain times of the year, or during crop failures, as replacement. For example, tubers collected in the forest may replace rice during shortages between two seasons. If the community qualifies a certain forest resource as marginal, always check that this applies all year long and all the time, for example by asking "are there certain times when this becomes more important?" If the answer is yes, then the importance of the resource should be moved to 2 (significant) and if there is no replacement during that period, it is an HCV.

If there are no fruits at all from the forest then obviously the level is 0.

For each need, if the forest is considered as "not important" or "non existent" (value 0 or 1) in fulfilling it, then it is not fundamental and will not be qualified as an HCV.

STEP 3: Identifying fundamental forest functions

For any need for which the forest has been ranked between 2 and 4 as a source (important, critical or essential), the consultation needs to be pursued more in detail by filling the next table below, which will establish the readiness of alternatives and whether they are within the reach of the people.

Changes are important to consider. Communities' livelihood patterns evolve. If a given resource from the forest is being less and less used and more and more replaced by alternative uses, this may disqualify a resource as fundamental. This is especially true when people are investing in alternative sources, for example if they are developing cash crop plantations that will make them less dependant on NTFP for cash needs. This criterion is especially important for 'ambiguous' cases where it is difficult to decide whether the resource is fundamental or not.

Questions in the table below will help to find out whether the resource is fundamental or not. It provides indicator of whether the community has access to satisfying replacements to the forest resources or not. Each resource for which there is no access to satisfying replacement is an HCV.

Again, this table is proposed as a guide; local groups or researchers may develop their own model to suit their needs.

Table 3 - Identifying fundamental forest resources

Village: *XXX*……	**Sub-Group:** (based on table 1) ***2***
Resource from the forest (e.g. timber for housing material, spring water, etc) as in table 2	**Ranking of importance of the forest in meeting this need (2 to 4), based on table 2:**
If this need cannot be met from the corresponding forest resource, are there available alternatives?	List the alternatives here. If there are none, this resource may be an HCV. If there are some, continue with rest of table.
Are these alternatives available • all year long every year, • in sufficient quantities to replace the forest resources • and in an accessible location by available means of transportation	If the answer is no to one of these questions: there may be an HCV. If the answer is yes to all questions: continue below.
If yes, can they be obtained for free or would there be a cost involved? (for example / cash needed to buy and transport a replacement, labour and land needed to start new agricultural activities?)	If the replacement is available for free (for example, free medicine at village dispensary), this is not an HCV. If there is a cost, continue.
If there is a cost, is it within the reach of all the people (for example do they have enough cash to buy it, or do they have enough labour and land to start a new agricultural production as replacement?)	If no: Fundamental/HCV; If yes: not fundamental

Is there a trend of change in the dependency of the people over this resource? For example, are they less and less using the rivers for water, or is the collection of NTFPs declining? If there is a trend of change, are the people investing in substitutes (e.g. developing cash crops, animal husbandry, etc.) Are they actively trying to protect the existing resources? Are all the members of the community concerned by these trends or just a minority?	In case of hesitation over the importance of a resource, obvious declining trends in the use of the forest, affecting the community as a whole may disqualify the forest from being considered as fundamental, especially if people are actively investing in new, alternative resources such as agriculture. On the contrary, if the community is actively protecting the forest resources, then it is an HCV.

IMPORTANT: if the forest is fundamental in needing even only one of the basic needs mentioned in the table 2 above, this is sufficient to qualify the corresponding resource as an HCV.

STEP 4: Identifying sustainable uses of the forest compatible with other HCVS

As mentioned above, HCVs do not cover excessive use of the forest resources beyond sustainable levels, or uses that are not compatible with the maintenance of other HCVs. Such uses of the forests by communities, once identified, have to be dealt with under other principles of certification. However, it is important to remember that the focus here is the lifestyle of local communities. If a forest usage is being made non sustainable by the local communities themselves, this usage is not an HCV – unless the communities are expressly hoping to reverse this trend. If the communities are using the resource in a sustainable way, but the resource is endangered by external parties, then the use of the forest by the local community is still an HCV that needs to be protected from external threats.

Table 4 - Identifying sustainable uses of the forest compatible with other HCVs

Village: *XXX*……	**Sub-Group:** (based on table 1) ***2***
Resource from the forest (e.g. timber for housing material, spring water, etc) as in table 2	**Ranking of importance of the forest in meeting this need (2 to 4), based on table 2:**
For how long has this resource being used by the local community?	Recent uses of the forest compelled by market development and not bound by traditional regulations may not be sustainable. Uses that have existed for at least a generation have a chance to be sustainable, unless there has been changes in availability and extraction levels (see next questions)
Are these resources used in a sustainable manner, i.e. do the villagers think that they can continue to sustain present use/ harvest	If the answer is yes, and unless there are indications of the contrary from other questions, then the resource use is

level indefinitely?	probably sustainable. Always use the questions below to confirm.
Has there been a declining trend in the availability of this resource during the last 5/10 years? (for example, hunted animals getting more rare, timber sources more far from the village…) Is this change due to external parties, or to the activities of the community itself (for example increased levels of extraction, conversion of the forest…)? For how long do they think they can sustain present levels before the resource will be exhausted?	If the resource availability is significantly declining because of the activities of the communities themselves, and/or if they forecast its exhaustion, this may not be an HCV, unless the communities express the will to change this trend.
Is the use of the resource by the community threatening other HCVs (such as endangered species for example?)	Besides consultation with communities, this will require discussions with an ecologist.
Is the community hoping, planning or wanting to reverse this trend ? Are there some rules that are followed by the community to regulate the use of this resource? Are the villagers ready to introduce such rules, and/or enforce old/existing ones?	If the resource is declining or threatening other HCVs but the communities are ready to do something to counter this trend, then this may still qualify as an HCV.

These questions should not always be asked directly. The best approach is to engage in an informal discussion. The first indicator in the exhaustion of a resource is not usually the fact that higher levels of inputs are needed to sustain the same level of output. For example, villagers may have to walk longer distances to find the fruits they need. Other indicators are a reduced quality of the resource harvested, for example people are logging trees of smaller and smaller diameter.

Management and monitoring of HCV5

Management Activity	**Guidance**
1. Identify a number of stresses and sources of stresses (i.e. threats) to identified HCVs	Identification of stresses and sources must be in collaboration with communities. In areas where logging activities has not occurred, people may not be able to identify logging activities as a threat to their HCVs. Thus during identification, toolkit users needs to discuss with the communities about the possible impact of logging activities and other forest management activities (roading, cruising, etc.) on the forest resources used by the people.
a. Evaluate the potential harmful effects of forest operations on these resources.	Conduct consultations with forest operations staff, village community members or other relevant sources (e.g. academic, government)
b. Identify other threats to the people's fundamental	Conduct consultations with forest operations staff, village community members or other relevant sources

Management Activity	Guidance
forest resources	(e.g. academic, government)
2. Identify possible conflicts between ecological aspects and social aspects of HCVFs	Conflicts should be identified with local communities.
3. Define strategies to mitigate those sources of stresses	Identify the stakeholders involved directly (those who perform the threatening activities) and those involved indirectly (those who regulate, finance, influence, or benefit from those activities).
a. Develop maps indicating the location of forest resources needed to meet their basic needs	Map development should be conducted in collaboration with local people. These maps should be developed prior to any intervention in a forest area. It is important to realize that they will likely cover much more than enclave areas. Abdoeallah *et al.* (1993) indicate that the territory of rights over forest resources of a Dayak village can cover as much as 1000 sq.km. The maps should indicate key areas needed by the people to access or conserve certain resources, and individual trees of particular importance.
b. Work with communities to determine if particular areas should be excluded from FMU's operations because they harbor a high density of fundamental resources.	The strategies should as much as possible be consistent with traditional rules and institutions. For example, community areas designated as Tanah Ulen (traditional conservation areas set aside for harvesting useful trees or protecting streams) can be used to define mutually-agreed conservation areas in critical watershed parts. If possible, the local government should be made to endorse such decisions to make sure that they will be responsible to protecting these areas too against other threats as mentioned just before.
c. Develop mitigation strategies (i.e. Reduced Impact Logging, etc.) to minimize the impact of forest operations on the peoples forest resources.	
d. Develop a set of standard operational procedures (SOPs) to make sure that staff intervening in forest operations are aware of these decisions and know what to do to implement them.	
e. Design strategies to approach other stakeholders involved practices threatening forest resources and reach agreements leading to a significant reduction of the threats to those resources.	

<table>
<tr><th>Management Activity</th><th>Guidance</th></tr>
<tr><td>4. Develop a conflict resolution mechanism for cases when community members think that their resources have been damaged or when mutually agreed conservation areas or rules are violated.

It should include:

• Representatives of the community and the company in case of a conflict.
• Standard compensation procedures and amounts for cases that are likely to occur (i.e. damage to a fruit tree, a honey tree, etc.)
• arbitration mechanisms and authorities.</td><td>The conflict resolution mechanism should be developed with local communities. Rules for conflict resolutions should be written down, signed by representatives of both parties if possible.

Records should be kept regarding all conflicts and steps taken to solve them.</td></tr>
<tr><td>5. If necessary, develop a strategy and rules for community participation in the conservation of other identified HCVs.</td><td>An environmental awareness program should be developed and implemented to help local communities identify the stresses and sources of other identified HCVs. Guidance and support from NGOs and academics may be necessary to develop agreements with local communities.</td></tr>
<tr><th>Monitoring Activity</th><th>Guidance</th></tr>
<tr><td>1. Determine the current condition of high conservation values identified and perceptions of trends in their conditions (including changes from the past to the present and likely future trends)</td><td>This can be accomplished by asking community members to rank the past state (15-20 years ago) present state, and future health (15-20 years from now) of each HCV or forest resource from very good, good, poor or very poor. Specific (if possible measurable indicators) of the State of the HCV or forest resource should be developed to define thresholds of "Very good, etc." for each of these indicators.
The ranking (from Very Good to Very Poor) is done based on these indicators. These results can be presented in tables, as in the following examples:

<table>
<tr><td>Resource: River</td><td></td></tr>
<tr><td>Parameter</td><td>Indicator</td></tr>
<tr><td>Depth / flow</td><td>"number of months a year during which the river can accommodate a 20-CV-engine boat".</td></tr>
<tr><td>Ranking</td><td>Level</td></tr>
<tr><td>Very Good</td><td>All year long (12 months)</td></tr>
<tr><td>Good</td><td>Not all year long (more than 3 months,</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Management Activity</th><th>Guidance</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>less than 12 months)</td></tr>
<tr><td>Poor</td><td>3 months or less</td></tr>
<tr><td>Very Poor</td><td>Never</td></tr>
</table>
<table>
<tr><td>Resource: Fruits</td><td></td></tr>
<tr><td>Parameter</td><td>Indicators</td></tr>
<tr><td>Quantity of fruits</td><td>Time of walk needed from the village to harvest fruits</td></tr>
<tr><td>Ranking</td><td>Level</td></tr>
<tr><td>Very Good</td><td>less than 30 minutes</td></tr>
<tr><td>Good</td><td>30 – 60 minutes</td></tr>
<tr><td>Poor</td><td>1 – 2 hours</td></tr>
<tr><td>Very Poor</td><td>More than 2 hours or no fruits at all</td></tr>
</table>
Other indicators can be developed by each local community to monitor the condition of their priority resource systems. In all cases, these indicators must be simple enough so that they can be measured by the community members themselves. This will enable the people to participate in the monitoring and lead to a better appropriation and use of the results.
</td></tr>
<tr><td>2. Develop and implement a participatory monitoring plan including the following steps:</td><td>For example, river depth can be measured using a simple stick marked with divisions of height, which can be left in a place visible by all, with measurements taken at regular intervals, always at the same time of the day, by one member of the community and then marked on a board visible by all. Turbidity can be measured using a simple stick marked with centimetre divisions, and terminated by a small marble. The depth at which the marble is not visible anymore is an indicator of turbidity.</td></tr>
<tr><td>a. Definition of the parameters to be monitored for each HCV</td><td>This should be conducted based on the results of consultations with local communities. Additional consultations with community members, academics or relevant NGOs can help the company determine acceptable indicators.</td></tr>
<tr><td>b. Develop a participatory monitoring program (including indicators and methodology)</td><td>For each indicator, there should be a simple methodology to measure it at defined intervals and time periods appropriate to the indicator, taken into account natural seasonal variations. Consistency of the method is key. The method should be simple enough and not too demanding in terms of work to be sustained over a long time.

Discuss the proposed methodology with community members to validate its feasibility.</td></tr>
<tr><td>c. With local communities, identify a person or a small team of community members to be responsible for implementing the monitoring program.</td><td>Follow-up should occur to ensure proper implementation of the monitoring program at regular appropriate intervals</td></tr>
</table>

Management Activity	Guidance
d. Analyze and socialize results of monitoring	Develop a method to feed-back the results to the community. An annual or semi-annual meeting is a good idea. Write a report on the results and feed it back to forest management. In case the monitoring indicates a degradation of forest resources, strategies need to be designed to protect the resource.
3. Incorporate the results of monitoring to revise and adjust conservation strategies,	Consultative meetings should be conducted once a year to: present and discuss the results of participatory monitoring develop conservation strategies if HCVs are threatened evaluate the effectiveness of implemented conservation strategies evaluate the conflict resolution mechanisms

HCV6. Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance in cooperation with such local communities)

As well as being essential for subsistence and survival, forests can be critical to societies and communities for their cultural values. This value is designed to protect the traditional culture of local communities where the forest is critical to their identity, thereby helping to maintain the cultural integrity of the community.

A forest may be designated a HCVF if it contains or provides values without which a local community would suffer a drastic cultural change and for which the community has no alternative. Examples of HCVF under this part of the definition with relevance to Indonesia would include:

- Protected forests with restricted uses under traditional communities' laws, such as *Tanah Ulen* in Kenyah Communities of Borneo (traditional areas with limited harvest rights and no conversion possible).
- Forests containing sacred ancestors' graveyards.
- Forests used to procure feathers of the Argus Pheasant used by Dayak communities in Borneo in headdresses for important ceremonies.
- Forests used by migrant communities who are totally dependant on the forest such as the Punan of Borneo or the Anak Dalam of Southern Sumatra.

As with the preceding HCV, identifying HCV6 will ultimately require consultation. That means that Preliminary Assessment can be used to identify where the value is likely to occur, but a Full Assessment to determine whether it actually is present will always require consultation at a local level. Because of the shared requirement of consultation for HCV5 and HCV6, it will usually be more convenient to examine them together.

1. Certain communities are so closely bound to the forest that there it is highly likely that the forests are critical to their traditional cultural identity. These would include:
2. Isolated (non-contact) groups
3. Indigenous groups
4. Communities governed primarily by traditional laws *(masyarakat adat,* who are usually considered as the Indonesian equivalent of Indigenous People)
5. Communities that are forest-dependant for their livelihoods

In Indonesia, there are many communities whose cultural identity is closely linked to the forest, especially through religious beliefs, rituals or through the implementation of *adat* laws.

Instructions for Forest Managers

Task	**Guidance**
Identify local community groups that are: • Isolated (groups living in areas with limited and difficult road and telecommunication access; groups that have almost no contact with outside groups) • Self-governing (with an active system of community laws) • forest-dependant for their livelihoods	Communities that are isolated, self-governing, or forest dependent are found throughout the forested regions of Indonesia. *Sources of information/data* Information should be obtained through consultations with local communities, especially with *tokoh adat*. Additional information may be available from: • Indigenous peoples' organisations (AMAN-Nusantara Indigenous Community Allaince) • Local government agencies (Data Pusat Statistik) • National and Rengional NGOs and Universities
Identify communities that have traditional cultural identities related to forests.	Information should be available from local communities, local government, NGOs and universities. A preliminary list of community groups known to have traditional cultural identifies related to forests are listed below: • Papua – Asmat, Dani • Kalimantan – Basap Batu, Punan, Penan, Iban, Modang, Kayan, Bahau, Ngaiu, Ot Danum, Maanyan, Lawangan, Kantu, Seberuang, Bugau, Mualang, Taman, Desa, Kayan, Kenyah • Sulawesi – Wana, Kamba, Mori • Sumatera – Anak dalam, Mentawai, Orang Rimba

	• Jawa Barat – Suku Badui, Suku Kasepuhan, Naga • Jawa Tengah – Samin • Jawa Timur – Tengger

Threshold for HCV

The difference between having some significance to cultural identity and being ***critical*** will often be a difficult line to draw and as with meeting basic needs, the way in which it is established will be highly variable. However, to be an HCV, the forest must be critical to the culture.

Ultimately, only consultation with the communities in question will resolve the question of whether any given forest is critical to their cultural identity.

Some groups may not be available for consultation, either because of access, or because they refuse contacts with outsiders. If there is clear evidence that the local communities may consider the forest to be of cultural significance, but where consultation is not possible, then the Precautionary Approach implies that it must be assumed to be a HCV.

If the forest is very small then it will not usually be appropriate to undertake a major consultation process.

Guidance	**Output**

Guidance	Output
Determine if communities are culturally linked to forest areas Possible indicators of cultural significance within Indonesia include: • Rituals and cultural events that are dependent upon particular locations or pristine forests (e.g. Upacara untuk menentukan areal tanam tahunan di Sulawesi, Upacara untuk pemujaan) • Spiritual and historical ties with particular, well identified locations within the forest (e.g. Kuburan tua, Kampung tua, tanah ulen, lokasi perlindungan tradisional, lokasi dengan sejarah tertentu yang dibuktikan dengan pemberian nama lokal.) • Cultural events and traditions are closely linked with forest products and cycles (e.g. Budaya makan larva madu/lebah pada bulan tertentu pada suku Dayak di Kalteng menggunakan jenis kayu tertentu untuk peti mati, menggunakan sumpit (blowing gun) using tuba dari getah kayu). • Frequent use of forest products/materials for artistic, traditional, and social status purposes (e.g. Dayak: Kuku, Taring put at the baby carrier indicate the social status, Bulu, tulang, dan kulit binatang, serta pandan, kulit kayu dan rotan sangat penting. Suku Toraja dan Bada yang menggunakan tanduk sebagai ekspresi status sosial.) • Traditional laws/regulations on forest use and protection (e.g. Sasi di Maluku, dimana pada suatu waktu tertentu tidak boleh mengambil hasil hutan) • Feeling of community/cultural pride or cultural identidy derived from unique or strong forest knowledge, products, history (e.g. Masyarakat suku Bada yang memiliki kelebihan dengan Model pakaian adat dari kulit kayu dan asesoris dari biji-bijian tertentu.)	Consultation with local communities will be the key to determining whether forest areas are culturally significant. Users should evaluate if the examples provided within the toolkit are relevant to local communities and if other relevant indicators exist. **If local communities are culturally tied to forest areas, users must determine if changes to the forest cause irreversible change to the culture. See below.**

Guidance	Output
When change to a forest can potentially cause an irreversible change to traditional local culture, then the forest should be designated a HCVF. Critical forest may include areas: • Well established and agreed community protected forest areas (protecting sense of self-governance) • Pristine/virgin forest areas where no viable alternative pristine areas exist (protecting sense of remoteness, history of hunting/gathering/traveling in virgin areas) • Specific areas considered sacred or perceived to have spiritual/supernatural connections, such as protected graveyards • Specific areas that have historically been actively governed and regulated • Specific areas with remnants from the past linked to the identity of an ethnic group, such as statues, megaliths, temples, graveyards, etc.	**If forest areas are determined to be critical to a community's culture and when changes to a specific forest can cause irreversible change to culture, then the forest area will be designated as HCVF.**
Several forests may be culturally important to local communities, but not all will be critical. • Non-critical forest areas **may** include areas: • Recently established (less than 3 generations or 30 years) protected and sacred areas • Forest areas used by recently established villages (less than 3 generations) or communities that frequently move following exhaustion of agricultural land • Non-timber forest product gathering areas where many other potential collection areas exist • Used to collect non-timber forest products where these products can be gathered or grown in non-forest areas • Used to collect non-timber forest products where alternative materials can be substituted without detrimental impacts	**When forests are culturally important to local communities, but particular forest areas are determined to be non-critical, the forest area will not be considered as an HCVF.**

Management and monitoring of HCV6

The management and monitoring recommendations for protecting the high conservation values identified above are the same as those described to protect HCV5. See Management and Monitoring of HCV5 above.

Appendix 1 – List of protected area categories in Indonesia

Indonesian	English
Taman Nasional	National Park
Taman Wisata	Recreational Park
Taman Buru	Game park
Cagar Alam	Strict Nature Reserve
Suaka Margasatwa	Wildlife sanctuary
Hutan Lindung	Protection Forest

Appendix 2 – Forest types that should be mapped in the FMU

Cloud forest

- Upper montane forest
- Lower montane rain forest
- Lowland forest
- Peat swamp forest
- Freshwater swamp forest
- Heath forest
- Lowland forest
- Savannah
- Limestone forest
- Mangrove

Appendix 3 – Preliminary list of terrestrial National Parks & other large, protected areas within Indonesia

Province	National Park or other Large Protected Areas
Aceh	Gunung Leurser National Park
North Sumatra	Karang Gading Wildlife Reserve Bukit Barisan National Park
West Sumatra	Siberut National Park Rimbo Panti Nature Serve Batang palupuh Nature Reserve Lembah Anai Nature Reserve Lembah Harau Nature Reserve
Riau	Bukit Tigapuluh National Park Kerumutan Wildlife Reserve Pulau Berkeh Nature Reserve Giam-Siak Kecil Wildlife Reserve
Jambi	Kerinci Seblat National Park Berbak National Park Hutan Bakau Pantai Timor Nature Reserve
South Sumatra	Sembilang Wildlife Reserve Terusan Dalam Wildlife Reserve Padang Sugihan Wildlife Reserve
Bengkulu	Bukit Kaba Nature Park Tabah penanjung Nature Reserve
Lampung	Bukit Barisan Selatan National Park

	Way Kambas National Park
West Kalimantan	Gunung Niut Wildlife Reserve Gunung Palung National Park Bukit Baka-Bukit Raya National Park Betung Kerihun National Park Danau Sentarum National Park
Central Kalimantan	Tanjung Puting National Park Bukit-Baka-Bukit Raya National Park
South Kalimantan	Pualu Kaget Nature Reserve Sungai Negara Wildlife Reserve Pleihari Tanah laut Wildlife Reserve Pleihari Martapura Wildlife Reserve
East Kalimantan	Kutai National Park Kayan Mentarang National Park Subuku Sembakung National Park Padang Luwai Nature Reserve Muara Kaman-Perairan Sungai Mahakam Nature Reserves
North Sulawesi	Bogani Nani National Park Watumohai National Park
Central Sulawesi	Lore Lindu National Park
South-east Sulawesi	Rawa Aopa National park Watumohai Nation Park
West Papua	Wasur National Park Lorentz National park

Appendix 4 – Sources of Information on Communities and Conservation in Indonesia

Area	**Organization**	**Contact Person**
Sumatera bagian utara (Aceh, Sumut, dan Riau)	SHK ACEH Yayasan Lauser Lestari HAKIKI Universitas setempat	
Sumatera bagian tengah (Jambi, Sumbar dan Bengkulu)	WARSI Universwitas Jambi Universitas Andalas Universitas Bengkulu	Ir. Rudy Syaf
Sumatera Bagian Selatan (Lampung dan Sumbagsel)	WATALA ICRAF-Lampung Yayasan Masyarakat Madani, Palembang Fakultas Kehutanan Universitas Lampung, Bandar Lampung Fakultas Hukum Universitas Sriwijaya, Palembang	
Jawa dan Madura	RMI LATIN ARuPA Yayasan Bina Swadaya Yayasan Gita Pertiwi Fahutan IPB Fahutan UGM	Ir. Nani Saptarini Ir. Arif Aliadi Ronald Shut Berdi Stevan Dr. Didik Suharjito Ir. San Afri Awang, MSc

Area	Organization	Contact Person
Kalimantan Barat	SHK Kalbar Yayasan Sosial Pancur Kasih Universitas Tanjung Pura Dian Tama	Matheus Pilin
Kalimatan Selatan	South & Central Kalimantan Production Forest Project Fakultas Hukum Universitas Lambung Mangkurat	Dr. Niken Sakuntaladewi Dr. Abdurachman
Kalimatan Tengah	Yayasan Tambuhak Sinta Universitas Palangkaraya	Haryo Birono Nyelong
Kalimatan Timur	SHK Kaltim NRM/EPIQ Yayasan Kaltim Hijau Yay. Bina Kelola Lingkungan (BIKAL) BIOMA-UNMUL CSF-UNMUL CARE – Indonesia The Nature Conservancy	Ade Cahyat Sugeng Raharjo Heryadi Adief Mulyadi Prof. Dr. M. Agung S Nesi Rosdiana
Sulawesi Selatan	Jurusan Kehutanan, Fak. Pertanian UNIVERSITAS HASANUDDIN WALDA-Toraja	 Ir. Samsu Alam, MSc Sombolinggi SH
Sulawesi Tenggara	Universitas Halu Aleo	
Sulawesi Tengah	TNC CARE-Indonesia Yayasan Bantaya Yayasan Tana Merdeka Yayasan Merah Putih Yayasan Evergreen Indonesia FKKM Faswil Sulawesi Tengah	 Hedar Laujeng Anto Sangaji Dedeng Alwi
Sulawesi Utara	NRM/EPIQ Yayasan Kelola Universitas Sam Ratulangi	
NTB	KONSEPSI (ex. Lp3ES NTB) DfID-NTB CARE Indonesia Universitas Mataram	Witardi
NTT	Yayasan Tananua Konsorsium Pengembangan Masyarakat Dataran Nusa Tenggara (KPMDNT) KOPPESDA Bird Life Indonesia Yayasan SANUSA	Umbu Rada Putra Swadika Agus Mulyana Sukiyanto Rony So
Maluku	Universitas Pattimura	
Papua	SHK-Papua NRM/EPIQ	

Appendix 5 – Conservation Science and Research Organizations

Organization	Specialty	Contact Information
LIPI	Biology and Conservation	
CIFOR	Forest Management and Ecology	
Birdlife International – Indonesia Program	Birdlife Biodiversity and Habitat	birdlife@indo.net.id
Wetlands International	Wetland Ecology, Biodiversity and Conservation	wi-ip@indo.net.id
Wildlife Conservation Society	Wildlife Biology, Biodiversity and Habitat	wcsstaff@bogor.indo.net.id
Biodiversity Conservation Institute	Biodiversity Conservation	

Appendix 6: Research relating to Social Aspects of HCVF Analysis

- *Manusia Daya: Dahulu, Sekarang Masa Depan.* Coomans, Mikhail. 1987. Jakarta: PT Gramedia
- *Kebudayaan dan Perubahan Daya Taman Kalimantan dalam Arus Modernisasi.* Anyang, YC Thambun. 1998. Jakarta: PT Gramedia
- *Peranan Kebudayaan Tradisional Indonesia dalam Modernisasi.* Dove, Michael R., Ed. 1985. Jakarta: Yayasan Obor Indonesia
- *Proses Transformasi Daerah Pedalaman diIndonesia.* Li, Tania Murray. 2002. Jakarta: Yayasan Obor Indonesia
- *Hutan: Darah dan Jiwa Dayak.* Pilin, Matheus dan Edi Petebang. 1999. Sistem Hutan Kerakyatan Kalimantan Barat.
- *Asas-asas dan Susunan Hukum Adat.* Ter Harr, B (Terjemahan K.Ng. Soebakti Poesponoto. 1981. Jakarta: Pradnya Paramita
- *Sesat Pikir Politik Hukum Agraria: Membongkar Alas Penguasaan Negara atas Hak-hak Adat.* Ruwiastuti, Maria Rita. 2000. Insist Press, KPA dan Pustaka Pelajar
- *Kebhinnekaan Masyarakat di Indonesia: Suatu Problmeatik Filsafat Kebudayaan.* Kusumohamidjojo, Budiono. 2000. Jakarta: Gramedia
- *Petani dan Konflik Agraria. Akatiga.* Suhendar, Endang dan Yohana Budi Winarni. 1998.
- *Aneka Budaya dan Komunitas di Indoensia.* Geertz, Hildred (diterjemahkan oleh A. Rahman Zainuddin). 1981. Yayasan Ilmu-ilmu Sosial dan FIS-UI
- Buku-buku penelitian CIFOR untuk Kalimantan
- *Kebudayaan dan Pelestarian Alam, penelitian interdispliner di pedalaman Kalimantan*. Egenter, Cristina and Selato, Bernard (penyunting). Kerjasama Dirjen PHPA, WWF and The Ford Foundation
- *Ketika kebun berupa hutan: AGROFORESTRY KHAS INDONESIA sebuah sumbangan masyarakat.* Editor : H de Foresta, A. Kusworo, G. Michon dan WA Djatmiko. 2000. International Centre for Research Agro Forestry (ICRAFT). Bogor, Indonesia.

- *Resiliensi Kehutantan Masyarakat di Indonesia*. Darusman, Dudung dkk. 2001. Kerjasama Fakultas Kehutanan IPB dengan The Ford Foundation. Bogor.
- *Income from the Forest, Methods for the development and conservation of forest product for local communities.* Editor : Wollenberg, Eva and Ingles, Andrew. 1998. Centre for International Forestry Research (CIFOR).
- *Hutan Rakyat di Jawa, Perannya dalam Perekonomian Desa*. Penyunting : Suharjito, Didik. 2000. Program Penelitian dan Pengembangan Kehutanan Masyarakat (P3KM) Fakultas Kehutanan IPB dengan The Ford Foundation.
- *Which Way Forward? People, Forest and Policy Making in Indonesia.* Editor Pierce Colfer, Carol J. and Resosudarmo, Ida Ayu Pradnja. 2002. CIFOR.
- *Laporan Midterm Review Program Kelembagaan HKM.* 2002. Kerjasama Direktorat Jenderal Rahabilitasi Lahan dan Perhutanan Sosial (RLPS) dengan The Ford Foundation. CAPABLE.
- *Exploring Biological Diversity, Environment and Local People's Perspectives in Forest Landscape*s. Sheil, D. Puri, R.K., Basuki, I., van Heist, M., Syaefuddin, Rukmiyati, Sardjono, M.A., Samsoedin, I., Sidiyasa, K., Chrisandini, Permana, E., Angi, E.M., Gatzweiler, F., Wijaya, A. and Johnson, B. with help from the people of Paya Seturan, Long Lake, Rian, Langap, Laban Nyarit, Long Jalan, Lio Mutai and Gong Solok. (2002) Center for International for Forestry Research, Ministry of Forestry and International Tropical Timber Organization, Bogor, Indonesia.

Appendix 7: Examples of filled tables

Table 1 – Identification of sub-groups within one village group

#	Ethnic group/origin	Main sources of livelihood	Other important characteristics	Approximate # of Households	Approximate % of village population
1	Bugis / Sulawesi	Fishing, logging, permanent farming (kebun)	Live along the coast	35	50%
2	Dayak Basap / Indigenous	Shifting cultivation, hunting, logging, permanent farming (garden plantations or *kebun*), fishing	Live in a permanent village built by government and company	12	17%
3	Dayak Basap / Indigenous	Shifting cultivation, hunting, NTFPs	Live in the upper part of the forest in temporary housing in shifting cultivation areas	25	33%

Table 2 - Fulfillment of Basic Needs

Village: XXX…….	**Sub-Group** (based on table 1): **#2 (see Table 1 above)**…….					
Needs	Sources					
	Forest	Cultivation	Purchased	Aid	Other (ex: sea)	Explanation, remarks
Food: Carbohydrates (rice, sago…)	0	3 (Rice, from shifting cultivation)	2 (Rice)			They need to buy rice for their harvest is not enough to fulfill the family needs of rice a year

animal protein (meat, fish)	Hunted animals (mostly pigs) : 3	1 (chicken, a few goats/ cattle)			Fish : 2	
fruits, vegetables	2	3				Forest provides fruits seasonally. Villagers also get fruits from their gardens
Materials for: housing	3				2	Government and HPH provide some houses for free to the villagers
boats	4					
furniture, household equipment, tools…	3 (mats, hunting tools…)		2 (cooking pots, etc.)			
Fuel	1 (wood)	4 (wood)	1 (oil)			Wood is collected mostly in swidden *(ladang)* and around the village, seldom in the forest.
Medicines	2			3		People go to dispensary (Puskesmas) when they are not well. They also collect medicinal plants from forest.
Animal Feeds	0	4				
Water for drinking and daily needs	4 (spring)					
Cash income	2 (timber, honey, fruits, birds' nests)	3 (banana and other fruits)				

Others:						

From the table above, for this particular group of people, the forest is essential for the supply of water and timber for boats construction, critical for the supply of protein and housing material and equipment, and important for cash income, medicine and fruits.

Table 3 - Identifying fundamental forest resources

Two examples are provided, one where there is no HCV, and one case of HCV.

Table 3a – Non HCV case

Village: *XXX*……	**Sub-Group:** (based on table 1) ***2***
Resource from the forest (e.g. timber for housing material, spring water, etc) as in table 2 – *Fruits*	**Ranking of importance of the forest in meeting this need (2 to 4), based on table 2: *2***
If this need cannot be met from the corresponding forest resource, are there available alternatives?	List the alternatives here. If there are none, this resource may be an HCV. If there are some, continue with rest of table. *Yes : the villagers have their own garden/ plantations near the village*
Are these alternatives available - all year long, - in sufficient quantities to replace the forest resources - and in an accessible location by available means of transportation	If the answer is no to one of these questions: there may be an HCV. In doubt, or if all the answer is yes to all questions: continue below. *All year long : yes* *Sufficient quantity : not for the moment* *Accessible location : yes*
If yes, can they be obtained for free or would there be a cost involved? (For example / cash needed to buy and transport a replacement, labour and land needed to start new agricultural activities?)	If the replacement is available all year long in sufficient quantities and in an accessible location for free (for example, free medicine at village dispensary), this is not an HCV. If there is a cost, continue. *There is a cost of labour and need of land to develop the plantations*
If there is a cost, is it within the reach of all the people (for	

example do they have enough cash to buy it, or do they have enough labor and land to start a new agricultural production as replacement?)	If no: Fundamental/HCV; If yes: not fundamental *The people seem to have enough labor or land to gradually develop new plantations if needed.*
Is there a trend of change in the dependency of the people over this resource? For example, are they less and less using the rivers for water, or is the collection of NTFPs declining? If there is a trend of change, are the people investing in substitutes (e.g. developing cash crops, animal husbandry, etc.) Are they actively trying to protect the existing resources? Are all the members of the community concerned by these trends or just a minority?	In case of hesitation over the importance of a resource, obvious declining trends in the use of the forest, affecting the community as a whole may disqualify the forest from being considered as fundamental, especially if people are actively investing in new, alternative resources such as agriculture. On the contrary, if the community is actively protecting the forest resources, then it is an HCV. *The people are developing new plantations and expressed that their main plan for the future is to convert more forest into plantations. This concerns all the people in the sub-group.*

From the example above, it can be concluded that the use of the forest for collecting fruits is not anymore an HCV for these people. Already they obtain more fruits from the plantations than from the forest, and they are collecting less and less fruit in the forest and are more and more cultivating them. They have the resources to develop alternatives when needed, in the form of new plantations. This is not a fundamental use, therefore not an HCV. This means that in a certification process, this element of the villages' livelihood should be treated under principles 2, 3 and 4 – but not under principle 9.

Table 3b – HCV Case

Village: *XXX*……	**Sub-Group:** (based on table 1) ***2***
Resource from the forest (e.g. timber for housing material, spring water, etc) as in table 2 – *Protein From Hunted Animals*	**Ranking of importance of the forest in meeting this need (2 to 4), based on table 2: *3***
If this need cannot be met from the corresponding forest resource, are there available alternatives?	List the alternatives here. If there are none, this resource may be an HCV. If there are some, continue with rest of table. *Yes : the villagers have some farm animals and fishing*
Are these alternatives available - all year long, - in sufficient quantities to replace the forest resources - and in an accessible location by available means of	If the answer is no to one of these questions: there may be an HCV. In doubt, or if all the answer is yes to all questions: continue below. *All year long : not necessarily in the case of fishing, which quantity may*

transportation	*vary according to season* *Sufficient quantity : not for the moment* *Accessible location : yes*
If yes, can they be obtained for free or would there be a cost involved? (for example / cash needed to buy and transport a replacement, labor and land needed to start new agricultural activities?)	If the replacement is available all year long in sufficient quantities and in an accessible location for free (for example, free medicine at village dispensary), this is not an HCV. If there is a cost, continue. *Fishing needs boats, equipment and labor. Developing breeding of farm animals needs some young animals to start, and some special care and medicines to protect them.*
If there is a cost, is it within the reach of all the people (for example do they have enough cash to buy it, or do they have enough labor and land to start a new agricultural production as replacement?)	If no: Fundamental/HCV; If yes: not fundamental *It would be difficult to develop fishing above the present time spent because of lack of labor and boats and equipment.* *People in the village are not successful in developing breeding of animals. Young animals have been given by the government and company, but most animals die of disease and they do not have access to the medicines.*
Is there a trend of change in the dependency of the people over this resource? For example, are they less and less using the rivers for water, or is the collection of NTFPs declining? If there is a trend of change, are the people investing in substitutes (e.g. developing cash crops, animal husbandry, etc.) Are they actively trying to protect the existing resources? Are all the members of the community concerned by these trends or just a minority?	In case of hesitation over the importance of a resource, obvious declining trends in the use of the forest, affecting the community as a whole may disqualify the forest from being considered as fundamental, especially if people are actively investing in new, alternative resources such as agriculture. On the contrary, if the community is actively protecting the forest resources, then it is an HCV. *The people at the present, with the available resources, do not seem to be able to develop alternatives sources of protein such as expanding fishing or breeding.*

Conclusion: Although the people have access to alternatives, these alternatives are not available all year long is sufficient quantity to replace hunted animals. Developing fishing or breeding would require resources that the villagers do not have for the moment. This means that the forest is fundamental in meeting their protein needs: then this is a case of HCV (provided it is sustainable and does not threaten other HCVs).

Table 4 - Identifying sustainable uses of the forest compatible with other HCVs

Village: *XXX*……	**Sub-Group:** (based on table 1) ***1***
Resource from the forest (e.g. timber for housing material, spring water, etc) as in table 2 ***Timber for cash income***	**Ranking of importance of the forest in meeting this need (2 to 4), based on table 2: 3**
For how long has this resource being used by the local community?	Recent uses of the forest compelled by market development and not bound by traditional regulations may not be sustainable. Uses that have existed for at least a generation have a chance to be sustainable, unless there has been changes in availability and extraction levels (see next questions) *This resource has been the main source of their cash income since they arrived in the village in the 1950s*
Are these resources used in a sustainable manner, i.e. do the villagers think that they can continue to sustain present use/ harvest level indefinitely?	If the answer is yes, and unless there are indications of the contrary from other questions, then the resource use is probably sustainable. Always use the questions below to confirm. *The villagers do not think that it is sustainable*
Has there been a declining trend in the availability of this resource during the last 5/10 years? (for example, hunted animals getting more rare, timber sources more far from the village…) Is this change due to external parties, or to the activities of the community itself (for example increased levels of extraction, conversion of the forest…)?	If the resource availability is significantly declining because of the activities of the communities themselves, and/or if they forecast its exhaustion, this may not be an HCV, unless the communities express the will to change this trend. *The timber is getting rarer, the harvest intensity has increased over the last 5 years, partly because of outsiders, but also local people who participate in the increased level of harvest. The local people think they cannot sustain this source of income for more than 5-10 years at best.*

For how long do they think they can sustain present levels before the resource will be exhausted?	
Is the use of the resource by the community threatening other HCVs (such as endangered species for example?)	Besides consultation with communities, this will require discussions with an ecologist. *The excessive harvest may threaten the biodiversity of the forest, and may also threaten the access to the resource by other communities who use it for building in a sustainable manner.*
Is the community hoping, planning or wanting to reverse this trend ? Are there some rules that are followed by the community to regulate the use of this resource? Are the villagers ready to introduce such rules, and/or enforce old/existing ones?	If the resource is declining or threatening other HCVs but the communities are ready to do something to counter this trend, then this may still qualify as an HCV. *The community seems not ready nor willing to address this. They consider it as an irreversible trend beyond their control. Their strategy is to develop cash-crop plantations as alternatives when the timber will have been exhausted.*

In this case, the commercial harvest of timber was conducted in a limited, sustainable way by a local community for a long time. Yet they are now admitting that they have increased their harvest to unsustainable levels to take advantage of increased market opportunities and prices. Yet they do not seem to have plans to counteract or mitigate this trend, their only hope is that when all the timber will be exhausted, they will turn to cash crops as an alternative. This is not an HCV, because this is a knowingly excessive use of a forest resource that threatens other HCVs, without any desires to restore the resource use to sustainable levels.

Appendix 8: Forest Stewardship Council Principles and Criteria

PRINCIPLE #1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES
Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

1.1 Forest management shall respect all national and local laws and administrative requirements.
1.2 All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid.
1.3 In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected.
1.4 Conflicts between laws, regulations and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case by case basis, by the certifiers and the involved or affected parties.
1.5 Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities.
1.6 Forest managers shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria.

PRINCIPLE #2: TENURE AND USE RIGHTS AND RESPONSIBILITIES
Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.

2.1 Clear evidence of long-term forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated.
2.2 Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.
2.3 Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS
The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognized and respected.

3.1 Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.
3.2 Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples.
3.3 Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized and protected by forest managers.
3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and

informed consent before forest operations commence.

PRINCIPLE #4: COMMUNITY RELATIONS AND WORKER'S RIGHTS
Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.

4.1 The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services.
4.2 Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families.
4.3 The rights of workers to organize and voluntarily negotiate with their employers shall be guaranteed as outlined in Conventions 87 and 98 of the International Labour Organisation (ILO).
4.4 Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups directly affected by management operations.
4.5 Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage.

PRINCIPLE # 5: BENEFITS FROM THE FOREST
Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.
5.2 Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.
5.3 Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.
5.4 Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product.
5.5 Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.
5.6 The rate of harvest of forest products shall not exceed levels which can be permanently sustained.

PRINCIPLE #6: ENVIRONMENTAL IMPACT
Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.

6.1 Assessment of environmental impacts shall be completed -- appropriate to the scale, intensity of forest management and the uniqueness of the affected resources -- and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.
6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.

6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:
a) Forest regeneration and succession.
b) Genetic, species, and ecosystem diversity.
c) Natural cycles that affect the productivity of the forest ecosystem.
6.4 Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.
6.5 Written guidelines shall be prepared and implemented to: control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.
6.6 Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.
6.7 Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.
6.8 Use of biological control agents shall be documented, minimized, monitored and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.
6.9 The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.
6.10 Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion:
a) entails a very limited portion of the forest management unit; and
b) does not occur on high conservation value forest areas; and
c) will enable clear, substantial, additional, secure, long term conservation benefits across the forest management unit.

PRINCIPLE #7: MANAGEMENT PLAN
A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated.

7.1 The management plan and supporting documents shall provide:
a) Management objectives.
b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.
c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.
d) Rationale for rate of annual harvest and species selection.
e) Provisions for monitoring of forest growth and dynamics.
f) Environmental safeguards based on environmental assessments.
g) Plans for the identification and protection of rare, threatened and endangered species.
h) Maps describing the forest resource base including protected areas, planned management activities and land ownership.
i) Description and justification of harvesting techniques and equipment to be used.
7.2 The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.
7.4 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.

PRINCIPLE #8: MONITORING AND ASSESSMENT
Monitoring shall be conducted -- appropriate to the scale and intensity of forest management -- to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

8.1 The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations as well as the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change.
8.2 Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators:
a) Yield of all forest products harvested.
b) Growth rates, regeneration and condition of the forest.
c) Composition and observed changes in the flora and fauna.
d) Environmental and social impacts of harvesting and other operations.
e) Costs, productivity, and efficiency of forest management.
8.3 Documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as the "chain of custody."
8.4 The results of monitoring shall be incorporated into the implementation and revision of the management plan.
8.5 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring indicators, including those listed in Criterion 8.2.

PRINCIPLE 9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS
Management activities in high conservation value forests shall maintain or enhance the attributes which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

9.1 Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.
9.2 The consultative portion of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof.
9.3 The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.
9.4 Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.

PRINCIPLE # 10: PLANTATIONS
Plantations shall be planned and managed in accordance with Principles and Criteria 1 - 9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

10.1 The management objectives of the plantation, including natural forest conservation and restoration objectives, shall be explicitly stated in the management plan, and clearly demonstrated in the implementation of the plan.
10.2 The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods, shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocks shall be consistent with the patterns of forest stands found within the natural landscape.
10.3 Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.
10.4 The selection of species for planting shall be based on their overall suitability for the site and their appropriateness to the management objectives. In order to enhance the conservation of biological diversity, native species are preferred over exotic species in the establishment of plantations and the restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.
10.5 A proportion of the overall forest management area, appropriate to the scale of the plantation and to be determined in regional standards, shall be managed so as to restore the site to a natural forest cover.
10.6 Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.
10.7 Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.
10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.
10.9 Plantations established in areas converted from natural forests after November 1994 normally shall not qualify for certification. Certification may be allowed in circumstances where sufficient evidence is submitted to the certification body that the manager/owner is not responsible directly or indirectly of such conversion.