ProForest

Part 3
Identifying and managing High Conservation Values Forests: a guide for forest managers

Contents

1. Introduction

1.1. Who is this part of the Toolkit for?

There are four main users for this part of the Toolkit:

1. Forest managers wishing to identify and manage HCVF in the absence of a clear national (or sub-national) definition of HCVF. The Toolkit is designed to assist forest managers by providing a robust framework that is likely to result in management that is in compliance with certification standards.
2. Forest managers who are working in places where a national standard already exists but who feel the need for further guidance on managing and monitoring the HCVFs in their forest management unit. This Toolkit is not intended to supersede any existing national standard. Instead it should be used, where necessary, to assist in meeting the requirements of that standard.
3. Certification auditors working in countries with or without a ratified national standard may find this a useful reference for checking that requirements relating to HCVF are met in an appropriate manner.
4. Purchasers, donors and investors who are conducting business in areas where there is no national certification standard, or who are dealing with clients that are not engaged in certification, and who may have internal policies relating to HCVF. For example, a purchasing company may not purchase from uncertified HCVF, a donor or investor may have a screening policy to ensure that the companies they deal with do not convert HCVF or may insist as part of the investment that HCVFs are adequately managed. In all of these cases, this part of the Toolkit can be used to ensure that these policies are implemented.

1.2. How does the Toolkit work?

This part of the Toolkit should be read in conjunction with Part 1 of the Toolkit, which is a general introduction to HCVF. The basic process that should be followed is to first **identify** any HCVF within the forest management unit; if HCVF is present, it should then be managed in such a way as to **maintain or enhance** the HCV; and finally, a programme to **monitor** the HCVF should be designed and implemented.

In addition to this Introduction, this part of the Toolkit contains four further sections:

Identifying HCVFs: this Section provides guidance for deciding whether a particular HCVF contains any HCVs and HCVF. It concentrates on what types of information will be suitable for identifying HCVFs in a given area of forest as well as providing guidance on the likely sources of such information.

Consultation: to meet the requirements of FSC Criterion 9.2, identification and management of HCVF should be done in consultation with stakeholders. Even a forest manager not engaged in certification will benefit from involving stakeholders in these processes, because it will allow them to call on a wide range of experience and knowledge and provides a greater degree of certainty that decisions regarding identification and management of HCVFs are suitable.

Managing HCVFs: one frequently asked question is: 'how should HCVFs be managed?' The true answer is 'because management should maintain or enhance the specific HCV, it depends on which is HCV present' – an answer that is simple but unhelpful. Because forests, and the values they contain, are so variable, it is not possible to give detailed global guidance on managing HCVF. Instead, we outline some of the basic ideas and principles that should ensure that HCVFs are appropriately managed. This means that forest managers will be able to develop management regimes that are appropriate for maintaining any identified HCVs taking into account the local conditions, resources and knowledge available to them.

Monitoring HCVFs: monitoring is an essential part of any forest management because it allows managers to know whether the aims of management are being achieved and provides information on whether management practices need to be changed. Because HCVs are, by definition, outstanding or critical, the effects of management on them have to be monitored with particular care. As with management, it is not possible to give detailed guidance on exactly how to monitor each type of HCV. Instead, this section concentrates on the basic processes that are likely to be necessary to implement a successful monitoring programme.

2. Identifying High Conservation Values and delineating High Conservation Value Forests

As discussed in Part 1 of the Toolkit, a High Conservation Value Forest is the area of forest required to maintain or enhance a High Conservation Value. This section of the Toolkit aims to assist the process of identifying HCVs and then delineate the HCVFs in a particular area of land. This will usually be a forest management unit, but may be another type of land management unit or a wider landscape.

The six generic HCVs are discussed in turn. For two of these (HCV1 and HCV4), separate elements are distinguished to enable clearer treatment of the HCVs. Many users will find it useful to refer to the general description of the HCVs and HCV elements given in Part 1 of the Toolkit whilst they are using this section.

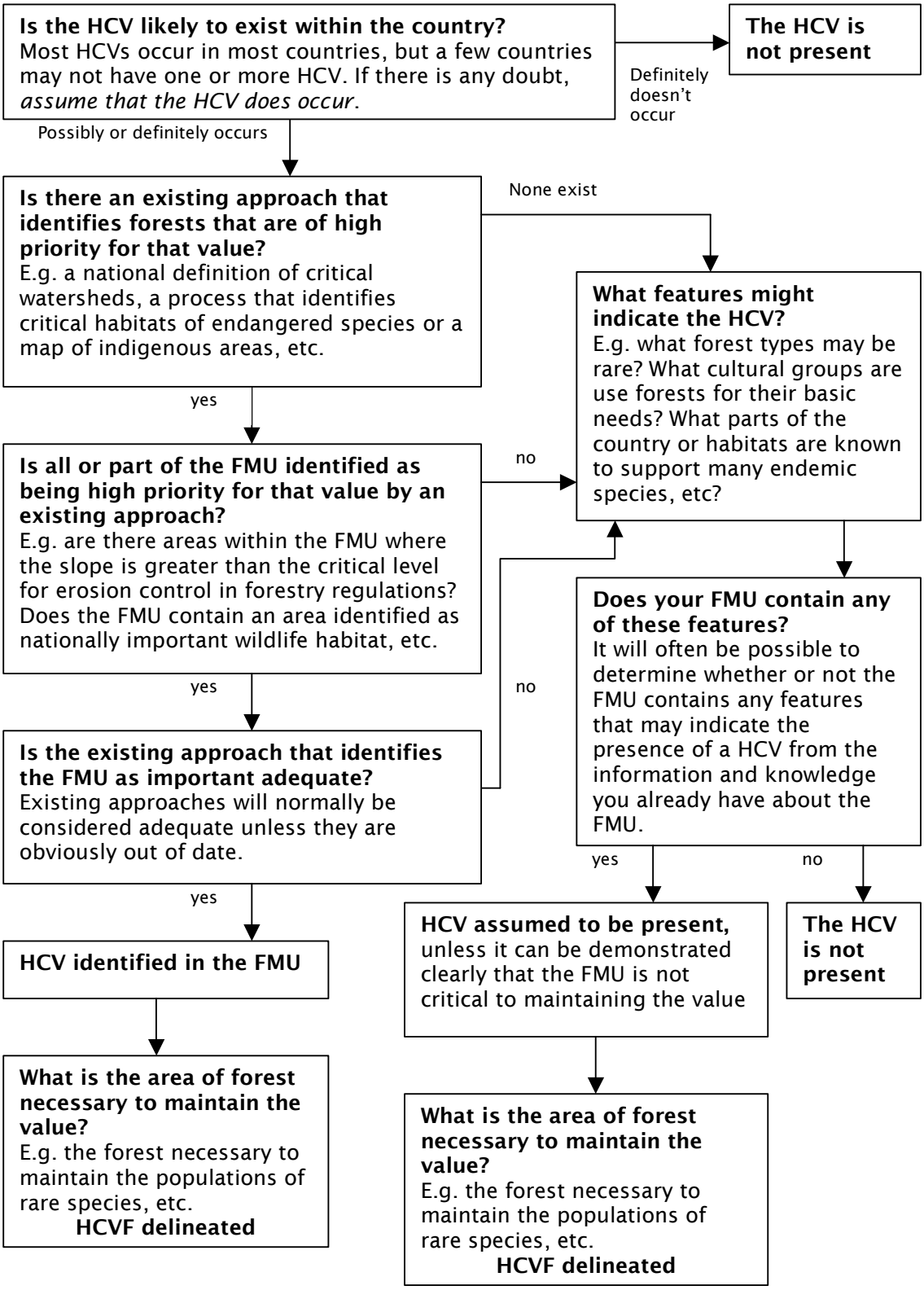
A decision tool is given, in the form of a table, to assist the identification of each HCV or HCV element. The basic scheme that is applied to each is illustrated in Figure 2.1.

At this stage, this diagram appears rather abstract and complicated. In fact, in many cases, forest managers will be able to determine very rapidly whether or not the FMU contains each HCV using the knowledge and information they already have. It is still useful though, to work through the process using an example.

Suppose that a forest manager is trying to decide whether an FMU contains a rare, threatened or endangered ecosystem (HCV3). The FMU is made up of a mix of natural forest types, some of them in good condition, so it seems possible that the HCV might be present. The starting point for identifying each HCV will be to identify any existing plans, schemes, maps or processes that identify all or part of the forest management unit as being priority areas for that value. So, in the example, this might be any national or provincial plan that has identified part of the FMU as being a priority area for conserving a particular forest type or habitat. This section of the Toolkit provides examples of the types of institutions and organisations that may produce (or be aware of) such prioritisation schemes. A forest manager will normally be expected to accept the findings of such a scheme (unless it is obviously out of date or fails to reflect adequately the scope of the HCV) and therefore will be able to identify whether this HCVF is present within the FMU or not.

If no such prioritisation scheme exists, or if it is inappropriate, then the next step will be to work out whether it is *likely* that the FMU contains the HCV. This involves two steps. The first will be to decide what are the greatest areas of concern for the value in question. In the example, this would be done through finding out which of the country's forest types have been identified as being rare, threatened or endangered. Again, possible sources of this information are given. The second step is to then check whether

Figure 2.1: A decision tree for identifying each type of HCVF using existing information and approaches.



the FMU contains one or more areas of these potential HCVFs. For example, this would involve checking whether the FMU contains one or more of the rare forest types. This will not usually require collection of data other than that required for other aspects of forest management[1]. The forest manager can therefore tell at this stage whether or not the FMU potentially contains a HCVF.

If the forest manager has decided that the FMU does *potentially* contain this HCV, the next step is to decide whether or not this *actually* constitutes a HCV. For example, if the threatened forest type within the FMU covers only a very small area, and the forest manager is aware that much greater extents occur in neighbouring forests and within a near-by protected area, the forest manager may decide that the area within the FMU should not be considered a HCVF[2].

This is perhaps the most difficult step, because it will require value judgements that have to be based on the wider context of the HCV. To return to the example, this might include knowledge of whether the forest type in question is well protected inside the existing national network of protected areas and whether the FMU contains a particularly large or un-degraded example of the forest type. These context-based decisions can be difficult because they require information and knowledge that few forest managers will have. It will therefore usually be helpful to consult with informed, independent stakeholders (e.g., a vegetation ecologist in a local research institute). Guidance is provided to illustrate the types of situation where a potential HCVF should be considered an actual one and when it should not.

If the presence of a HCV has been confirmed, then the final step will be to delineate the HCVF. As mentioned above, this should be the area of forest required to maintain or enhance the HCV. In many cases it will be straightforward to decide this – in the example discussed, it would clearly be the area of the FMU covered by the threatened forest type. For some of the other HCVs this step will be more difficult and will require assessment of what areas of forest are critical for the value concerned (such as critical habitats for a concentration of rare species). As with the previous step, consultation with informed, independent stakeholders is likely to be important to assist this decision.

The following table can form the basis a checklist which can be used to track progress on identifying HCVs within a forest.

---

[1] For example, part of the requirements of FSC Principle 6 Criterion entails that forest managers have assessed what ecosystems are present within their FMU.

[2] This does not, of course, imply that the forest manager will not take adequate care of the forest type, as it should still be maintained under the requirements of other parts of a forest management standard. For example, FSC Principle 6 Criterion states "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" (FSC Principles and Criteria, 2000, www.fscoax.org).

Table 1.1 Working checklist for identifying HCVs within a forest

HCV (or HCV element)	Present or Absent?	Sources of Information
HCV 1 Globally, regionally or nationally significant concentrations of biodiversity values		
HCV1.1 Protected Areas		
HCV1.2 Threatened and endangered species		
HCV1.3 Endemic species		
HCV1.4 Critical temporal use		
HCV2 ***Globally, regionally or nationally significant large landscape level forests***		
(No additional elements)		
HCV3. Forest areas that are in or contain rare, threatened or endangered ecosystems		
(No additional elements)		
HCV4. Forest areas that provide basic services of nature in critical situations		
HCV4.1 Forests critical to water catchments		
HCV4.2 Forests critical to erosion control		
HCV4.3 Forests providing barriers to destructive fire		
HCV5. Forest areas fundamental to meeting basic needs of local communities		
(No additional elements)		
HCV6. Forest areas critical to local communities' traditional cultural identity		
(No additional elements)		

2.1. HCV1. Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values

As discussed in Part 1 of the Toolkit, this HCV has four elements, each of which will need to be considered:

- **HCV1.1 Protected areas**
- **HCV1.2 Threatened and endangered species**
- **HCV1.3 Endemic species**
- **HCV1.4 Critical seasonal use**

The first of these elements (protected areas) needs to be dealt with separately, but forest managers are likely to find it more convenient to treat HCV1.2, 1.3 and 1.4 together. This is because, although these elements reflect different biodiversity values, the process required and types of information required to identify them, as well as the organisations that can provide information on them, are similar. However, if a forest manager does identify one or more of these elements within the FMU, it will be useful for developing appropriate management and monitoring regimes (and also for communicating with external stakeholders) to remain clear on the precise element that is present.

2.1.1. HCV1.1 Protected Areas

Protected areas included as an element of HCV1 because they are a vital component of biodiversity conservation. It is worth noting that some types of protected area may be treated under other HCVs. For example, legally defined water catchment areas may be HCVs under HCV4.

1.1.1 Determine whether the FMU is within or contains a protected area	
Guidance	This will include: • legally protected areas equivalent to IUCN categories I-V[3] as well as areas that have been proposed for protected area status by the relevant statutory body but have not yet been not yet gazetted; and

[3] Protected areas are usually categorised by management objective, ranging from areas that are managed mainly for science of wilderness protection (IUCN Category I) to those that are managed mainly for the sustainable use of natural ecosystems (IUCN Category VI). Definitions of IUCN protected area categories can be found at http://wcpa.iucn.org/

	• when the forest manager has some management responsibility for the management of the protected area (i.e. excluding situations where the FMU encompasses one or more protected areas which are managed by another body). *If the FMU is within or contains such a protected area, go to step 1.1.2* *If not, this HCV element is not present.*
Information sources	National, provincial and local government agencies responsible for protected areas or conservation, IUCN, UNESCO World Heritage Sites[4], RAMSAR Sites[5].
1.1.2 Determine whether this part of the FMU is a HCVF	
Guidance	A protected area will normally be considered HCVF except when: • the FMU (or relevant part of the FMU) plays no important role in the biodiversity conservation of the protected area as a whole (e.g., a plantation of exotic species within a largely natural protected area) or in maintaining the ecological integrity of the protected area (e.g., it is not critical to protecting the protected area's watershed – see HCV4); • the protected area is a low protection category in a country where protected areas are not threatened by encroachment, degradation, etc. Consultation with relevant organisations should be conducted to confirm these decisions.
Information sources	Potential consultees include national, provincial and local government departments or agencies responsible for protected areas, NGOs and conservation biologists.

2.1.2. HCV1.2 – 1.4: Threatened and endangered species, endemics and temporal concentrations

These elements concern significant concentrations of rare species, endemic species and temporal concentrations of species respectively. A key issue for all three elements is the decision as to which taxonomic groups should be covered. In practise, it is impossible to consider all taxa, because:

[4] Information on UNESCO World Heritage Sites can be obtained from: http://www.unesco.org/

[5] Maps of wetlands of international importance can be obtained from: http://www.wetlands.org/

- there may be insufficient information on the distribution, conservation status and ecology of some taxonomic groups – information which is necessary to make decisions to be made regarding them;
- species in some taxa can only be identified by a small number of specialists, and so it would be unreasonable to expect forest managers to do so.

The most practical solution to this may be to concentrate on groups that are relatively easily identified and well-understood taxonomic groups (e.g. large mammals and birds). A potential benefit of this is that such groups could potentially act as indicators of important sites for less well known taxa. Other taxonomic groups could then be considered only if the country (or part of it) is known to contain important concentrations of rare (HCV1.2) or endemic species (HCV1.3).

1.2.1 Determine if all or part of the FMU has been designated a priority site for threatened or endangered species, endemics or maintaining significant temporal concentrations of species	
Guidance	Priority schemes are those that identify individual areas of forest as being of outstanding importance for conserving threatened or endangered species[6], endemics or that contain significant temporal concentrations of species. Types of scheme to consider include: • National-level processes for identifying sites of outstanding importance for the conservation of threatened or endangered species, endemics or temporal concentrations of species[7]. • National-level processes that are limited to certain important taxonomic groups (e.g. birds, mammals, plants) • Prioritisations schemes that are limited to specific regions of the country, where these regions have already been identified as being of outstanding importance[8]. *For HCV elements for which no such prioritisation is available, go to step*

[6] Priority sites that have been identified for conserving just one threatened or endangered species can be considered if there is good reason to believe that several other threatened or endangered species are likely to be found within the same habitat or if the species is of exceptional global conservation concern (e.g., mountain gorilla, giant panda, Javan rhinoceros). Forest managers may choose to include species with the highest international conservation status (e.g., IUCN 'Critically Endangered').

[7] For example, within the European Community, member countries have the responsibility of designating sites of outstanding importance for the protection of rare birds, animals and plants that may then be incorporated into the 'Natura 2000' network of key biodiversity sites. Prioritisation processes that are national in scope but that are administered at a lower political

	1.2.2
	Any part of the FMU that has been identified as a priority site for threatened or endangered species, endemics or for maintaining significant temporal concentrations of species will normally be considered a HCVF.
Information sources	National, provincial and local government agencies responsible for conservation, NGOs. Various prioritisation schemes that consider only certain key areas of the country have been conducted by different NGOs using slightly different approaches[9], in addition to the sources outlined above. These typically identify all of the three elements. Prioritisation schemes that consider only particular taxonomic groups include: Important Bird Areas[10] and Important Plant Areas[11] (for concentrations of threatened or endangered species and seasonal concentrations), Endemic Bird Areas[12] (for concentrations of endemics), in addition to the sources outlined above.
1.2.2 Determine whether the FMU is within a part of the country that is a priority for rare species, endemics or for maintaining significant temporal concentrations of species	

---

level (e.g., where provincial authorities are given the responsibility of identifying key sites) should also be included.

[8] This HCV concerns "globally, regionally or nationally significant" values, and so identification of key areas of the country (through global processes, such as WWF Global 200 Ecoregions or Conservation International 'hotspots', or through national-level plans), with a subsequent identification of priority sites within these are consistent with this. Prioritisation that deals with only part of the country but is not linked to any national, regional or global analysis will not normally be considered.

[9] For example, WWF have used Ecoregion Vision Workshops (http://www.worldwildlife.org) and Systematic Conservation Planning (bpressey@ozemail.com.au), The Nature Conservancy use 'The Five-S Framework System (http://nature.org) etc.

[10] BirdLife International provides maps and lists of Important Bird Areas (IBAs). Current level of coverage varies between regions and in countries within regions. Information (including data sources), can be found at http://www.birdlife.net/sites/index.cfm and for North America at: http://www.audubon.org/bird/iba/index.html

[11] Information on Important Plant Areas (IPAs) can be found at Plantlife: http://www.plantlife.org.uk

[12] BirdLife International defines 218 areas worldwide as being of outstanding importance for endemic bird species. A detailed account of the world's 218 Endemic Bird Areas (EBAs): Alison J. Stattersfield, Michael J. Crosby, Adrian J. Long and David C. Wege (1998). Endemic Bird Areas of the World. BirdLife International. See also http://www.birdlife.net

Guidance	This deals with prioritisations that identify parts of the country rather than with individual forest sites. The whole or part of the country may have been identified as being of outstanding importance for the conservation of threatened or endangered species, endemics or that contain significant temporal concentrations of species. This may be the result of global (e.g., WWF Global 200 Ecoregions, Conservation International 'hotspots'), regional or national analyses. Although such analyses do not identify individual areas of forest, they do indicate that forests within the priority area are more likely to be of significance for biodiversity values. *If the FMU is within a conservation priority region, go to step 1.2.4* *If not, go to step 1.2.3*
1.2.3 Determine whether the FMU is likely to have concentrations of rare species, endemics or contains significant temporal concentrations of species	

	The FMU will be more likely to contain one of these HCV elements if: • existing information[13] shows that several rare species, endemic species or exceptional seasonal concentrations of species are present (or likely to be present) within the FMU; or if the FMU • is less degraded by recent human activities than most FMUs within the region; and • contains only a small proportion of exotic plantations; or • borders with a protected area or is part of a larger forest area that connects one or more protected areas; or • is in a region where protected areas are threatened by encroachment, degradation or by land-use plans that would result in use incompatible with their status; or • contains examples of naturally isolated habitats, such as islands, isolated mountain groups or outcrops of unusual bedrock (which often contain particularly high levels of endemism); or • contains landscape or habitat features likely to contain critical temporal concentrations of species (e.g., if the FMU is all or part of a forest that links different altitudinal zones, contains salt licks or extensive riparian forest areas that are used by many species of animal from the surrounding landscape). It will be important to confirm decisions with informed, independent stakeholders. *If any of the HCV elements are potentially present within the FMU, go to step 1.2.4.* *If none are found, this HCV is not present within the FMU.*
	Relevant information will include existing biodiversity studies, species distribution maps, species occurrence records within the FMU and the knowledge of local conservation biologists. Potential informed, independent stakeholders include government agencies responsible for conservation issues, local research institutes and conservation biologists and NGOs.
1.2.4 Collect information on the presence of rare species, endemics and seasonal concentrations of species within the FMU	
Guidance	The forest manager will need to assess whether the FMU contains concentrations rare species, endemics or significant temporal

[13] Forest managers may already be aware of the presence of rare, threatened or endangered species through biodiversity surveys, species range maps, discussions from local conservation biologists etc.

	concentrations of species. This information may already be available if one or more biodiversity surveys has been conducted within the FMU (as required for other aspects of forest management standards). If this has not yet been done, then a biodiversity survey will have to be conducted. As these can be time consuming and expensive, it will be useful: • concentrate on key taxonomic groups that are likely to be found in significant concentrations within the FMU, rather than on producing comprehensive species lists • where the habitat requirements of these species groups are known, habitat surveys may be a more efficient survey technique than general biological surveys[14]. *If the FMU contains several threatened, endangered or endemic species, at least one species of extreme global conservation concern, or temporal concentrations of species, go to step 1.2.5* *If the FMU does not contain of the above, then this HCV is not present within the FMU.*
Information sources	Information on relevant taxonomic groups and survey techniques government agencies responsible for conservation issues, local research institutes and conservation biologists and NGOs
1.2.5 Determine whether the FMU contains a significant concentration of threatened or endangered species, endemics or a significant temporal concentration of species	
Guidance	The forest manager will need to decide whether the concentration of species found is *significant*. This decision is inevitably a value judgement and so consultation with independent, informed stakeholders will be critical. It is worth remembering that other parts of forest management standards deal with the situation where an FMU contains just one or a few threatened species, endemics or where part of the FMU is provides an

[14] For example, in Sweden, FMUs are surveyed for Woodland Key Habitats. These are areas where IUCN red listed plants or animals exist or could be expected to exist. Survey for them is carried out in two steps:

- The surveyor searches for potential key habitats by compiling information from a variety of sources, e.g. infrared aerial photographs, forest inventories and forest management plans, information from landowners and non-governmental organizations and different types of maps.
- Potential areas are visited in the field. Areas that are assessed to fulfil the requirements of a woodland key habitat are delimited and described. Three main aspects on the key habitat quality are considered: stand history; current stand structure; occurrence of indicator species and red listed species. The relative importance of these aspects can vary between different key habitats.

	important seasonal resource to a few species. Potential indicators of HCVF status include: • the presence of any species of exceptional international concern (e.g. mountain gorilla, giant panda, Javan rhinoceros) where the existing legislation and the current protected area network does not provide sufficiently for their protection. Consider species with the highest international conservation status (e.g. IUCN 'Critically Endangered'); • the presence of any unusual ecological or taxonomic assemblages of rare or endemic species. This might include the presence of a complete assemblage of species with critical ecological functions (e.g. top predators) or evolutionary status (e.g., a suite of closely related rare species) that included a number of threatened or endangered species, or an assemblage of endemic species within a particular habitat or a suite of closely related endemic species; • the population size of the rare species. For species of high conservation status, the presence of a potentially breeding pair might be sufficient to warrant HCVF designation, for other species larger populations or sub-populations should be considered; • the proportion of the national (or regional or global) population of the species that uses the FMU; • the number of species that use the FMU seasonally, or the extent of habitat potentially suitable for them. *If no, the HCV is not present within the FMU* *If yes, the HCVF is present: go to step 1.2.6*
Information sources	Potential independent, informed stakeholders are listed for step 1.2.4 above.
1.2.6 Delineate the HCVF	
Guidance	The HCVF will be the area of forest required to maintain or increase the populations of the identified suite of rare species. This will require some knowledge of the biology of the species in question, but will include: • parts of the FMU that are critical habitats or resources for breeding (e.g., nesting or hibernation sites) and feeding of the species (e.g., seasonal feeding areas); • areas that permit movement of individuals between these resources (e.g., corridors of closed forest that permit species unable to move through open areas to move between critical feeding sites) • areas that protect these resources (e.g., mangrove forest fringing a coastal mudflat with exceptional seasonal concentrations of waterbirds).
	The HCVF will be the area of forest required to maintain or increase

	the populations of the identified suite of rare, threatened or endangered species.
Information sources	See step 1.2.4

2.2. HCV2. Forest areas containing globally, regionally or nationally significant large landscape level forests

This part of the HCVF definition aims to identify those forests that contain viable populations of most if not all naturally occurring species or important sub-populations of very wide-ranging species. In such forests, natural disturbance regimes, forest succession, species distributions and abundance will be largely or wholly unaffected by recent anthropogenic activities.

2.1 Determine whether the FMU has been identified as all or part of a priority landscape level forest	
Guidance	The FMU could potentially be all or part of a significant large landscape level forest if it is: • all or part of an 'intact forest landscape'; • all or part of a forest area that within a large protected area (i.e., tens of thousands of hectares in size) that has been gazetted to maintain a natural landscape • borders with a large protected area that has been created to maintain a natural landscape • connects two or more protected areas, with the whole reaching at least tens of thousands of hectares in size *If the FMU is in one of these situations, go to step 2.2.* *If not, go to step 2.3*
Information sources	Definitions and maps of 'intact forest landscapes' for several countries are available from Global Forest Watch[15]. Information about protected areas should be available from government agencies responsible for protected areas or nature conservation and from NGOs. Local maps will be critical in determining the landscape context of the FMU.
2.2 Determine whether the FMU is critical to maintaining the integrity of the priority landscape	
Guidance	It is anticipated that an FMU within any of these types of priority forest landscapes will usually be considered HCVF unless:

[15] www.globalforestwatch.org

	• it is very small in relation to the landscape (e.g. tens or hundreds of hectares in a landscape forest tens of thousands of hectares in size) or is small compared to other FMUs within the same landscape; • it is all or largely covered by plantations of exotic species. Where there is any reasonable doubt about whether the FMU is a critical or integral part of the priority landscape, the forest manager should try to gain consensus amongst informed, independent stakeholders. *If the FMU is not a critical part of the forested landscape, this HCV is not present*
Information sources	Informed, independent stakeholders and experts will include local conservation biologists and research institutions as well as NGOs
2.3 Determine whether the FMU is part of a large landscape level forest	
Guidance	If the FMU is all or part of a large forest area that is at least tens of thousands of hectares in size, then it is part of a large landscape level forest. This should also include landscapes where forest and non-forest vegetation forms a natural mosaic and where many species use both forest and non-forest ecosystems. *If the FMU is part of a landscape level forest, then the next step is to decide whether the landscape is significant – go to step 2.4* *If the FMU is not part of a large landscape level forest, then this HCV is not present within the FMU*
Information sources	Local maps showing vegetation cover
2.4 Determine whether large landscape level forest is significant	
Guidance	This step requires deciding whether the landscape is unusually valuable. It requires that the landscape in which the FMU occurs is considered in a wider context, and so the knowledge and opinions of independent, informed stakeholders will be very useful in making the decision. The landscape is likely to be considered significant if large landscape level forests are: • rare within the country; • not well protected by the protected area network within the country; or if the large landscape level forest in which the FMU occurs: • is one of the largest within the country; • is less affected by recent human activities such as roads, forest clearance or oil and gas pipelines than most other such areas within the country; • is more natural (in terms of natural disturbance patterns, species composition, stand structure, habitat composition and absence of

	exotic species) than most others within the country; • contains populations of several species with large range requirements such as top predators or other large mammals) where these are uncommon within the country *If the landscape in which the FMU occurs is potentially significant, go to step 2.2* *If it is not, the FMU does not contain this HCV*
Information sources	Informed, independent stakeholders and experts will include local conservation biologists and research institutions as well as NGOs Information on the landscape in which the FMU occurs will be available from forest cover maps, forest management maps and satellite imagery

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

This value is designed to ensure that threatened or endangered forest ecosystems, communities or types are maintained.

3.1 Decide whether priority ecosystems already identified within the FMU are HCVF	
Guidance	Rare forest types within the FMU may already have been identified during management planning. *If the FMU does not contain any areas of rare forest types identified as priorities then this HCV is not present.* *If such areas have not yet been identified, go to step 3.2*
	These will normally be considered HCVF if they have been identified through forestry regulations, as part of a provincial, national or regional ecosystem or habitat conservation plan or have special legal status.
Information sources	Information on individual forest areas that have been identified as priority sites for ecosystem conservation may be available from conservation priority setting maps or criteria produced by government agencies responsible for environmental conservation[16], acknowledged authorities on biodiversity (e.g. NatureServe, Infonatura[17]), NGOs and research institutes.
3.2 Determine whether the FMU contains any rare, threatened or endangered ecosystems that could potentially be HCVF	
Guidance	The first piece of information needed to assess this is information on the forest types present within the FMU. In many cases, this will already have been done as it is an important part of forest management planning and is also required to comply with other parts of forest management standards. If this is not yet known, then a vegetation survey may be required. The

[16] For example, under the 'habitats' directive, member states of the European Union must identify and designate as Special Areas of Conservation sites that contain habitats whose natural range is very small or has shrunk considerably or that are outstanding examples of European Community ecosystems.

[17] NatureServe provides searchable databases and other information on species and ecosystem distribution in North America (www.natureserve.org) and distribution of birds and mammals in Latin America at www.infonatura.org

	appropriate methodology will vary from country to country and also depend upon the size of the FMU and the resources available to the forest management, but, wherever possible, the methodology used should be consistent with accepted provincial or national vegetation classifications. The information on the forest types that occur within the FMU need then to be compared to existing information about forest types, which may be: • a country-wide identification of priority forests for ecosystem conservation (*repeat step 3.1*)[18] • identification of priority forests in specific parts of the country, for example, at provincial level (*repeat step 3.1*) • identification of priority areas within the country or priority forest types (*go to step 3.3*)[19] • an assessment of the extent of existing forest cover for each forest type (*go to step 3.3*) • an ecosystem classification (*go to step 3.3*)
Information sources	• Information on individual forest areas that have been identified as priority sites for ecosystem conservation may be available from forestry regulations, laws giving special legal status to part of the forest, conservation priority setting maps produced by government agencies responsible for environmental conservation, acknowledged authorities on biodiversity (e.g. NatureServe, Infonatura[20]), NGOs and research institutes. • Areas of the country that are a particular priority for conservation may be found from global conservation priorities are available from WWF Global 200 ecoregions[21] and Conservation International 'hotspots'[22], as well as from the sources listed above.

[18] For example, under the 'habitats' directive, member states of the European Union must identify and designate as Special Areas of Conservation sites that contain habitats whose natural range is very small or has shrunk considerably or that are outstanding examples of European Community ecosystems.

[19] For example, globally-applicable prioritisation schemes include WWF's Global 200 Ecoregions (http://www.panda.org) and Conservation International's 'hotspots' (www.conservation.org) as well as national or provincial-level identification of priority regions.

[20] NatureServe provides searchable databases and other information on species and ecosystem distribution in North America (www.natureserve.org) and distribution of birds and mammals in Latin America at www.infonatura.org

[21] WWF Glogal 200 Ecoregions. Globally important ecoregions are defined on the basis of species richness; endemism; higher taxonomic uniqueness; extraordinary ecological or evolutionary phenomena and global rarity of the major habitat type (see http://www.panda.org).

	• Assessment of forest cover and ecosystem classifications should be available from local agencies responsible for environmental conservation, NGOs and research institutes. • Where little information exists, build on all available sources and previous definitions of 'threatened and endangered[23]'.
3.3 Decide whether any of the forest types with in the FMU are rare, threatened or endangered	
Guidance	In the absence of an existing, widely accepted scheme or plan that identifies individual forest areas as being priorities for conserving rare, threatened or endangered ecosystems, a forest manager will have to make decisions about the conservation status of the forest types within the FMU. It will be important and most efficient to do this in consultation with independent vegetation specialists. *If the FMU contains one or more rare, threatened or endangered forest types, go to step 3.4* *If none occurs, this HCV is not present.*
Information sources	Local agencies responsible for environmental conservation, NGOs and research institutes
3.4 Determine whether any of the rare, threatened or endangered ecosystems within the FMU should be considered HCVF	
Guidance	Rare, threatened or endangered forest types within the FMU will normally be considered HCVF unless they are: • small patches of the forest type where several larger patches are known to exist locally, • very degraded compared to other local examples of the forest type • a type of forest that is well protected by the existing protected area network
	The HCVF will be the area of forest covered by that forest type.

[22] Conservation International 'hotspots' are areas that contain outstanding levels of endemism and that have suffered high levels of habitat loss. Information available at www.conservation.org

[23] For example, the US National Biological Service classify ecosystems as critically endangered (>98% decline), endangered (85-98% decline), and threatened (70-84% decline) by comparison to original pre-European settlement distributions with both quantitative and qualitative indicators (area, relative abundance of seral stages, particularly old-growth, etc). Noss, R.F., E.T. LaRoe, and J.M. Scott. 1995. Endangered ecosystems of the United States: a preliminary assessment of loss and degradation. Washington, DC: Biological Report 28. USDI National Biological Service.

2.4. Identifying HCV4: Forest areas that provide basic services of nature in critical situations

Since there is a range of separate ecosystem services, this value has been sub-divided into three elements (see Toolkit Part 1 Section 2.4):

- **HCV4.1 Forests critical to water catchments**
- **HCV4.2 Forests critical to erosion control**
- **HCV4.3 Forests providing barriers to destructive fire**

2.4.1. HCV4.1 Forests critical to water catchments

All forests affect the watersheds in which they occur. However, the watershed protection function of individual forests is not always critical. Forests can be considered critical to watershed protection when a particular forest area protects against:

- potentially catastrophic floods or drought
- widespread loss of irreplaceable water for drinking, agriculture, hydroelectric schemes and other uses,
- the destruction of fisheries where spawning grounds had been protected by mangroves or riparian forests
- changes to the hydrology of a catchment that would seriously and irreversibly degrade a protected area.

Some forest types are particularly important in regulating stream flow, and so more likely to be critical to watershed functioning. Examples include riparian forest and cloud forest.

4.1.1 Identify whether any part of the FMU is identified as being vital to watershed protection by an appropriate existing process for protecting critical catchments

Guidance	Most countries have a system for identifying critical watersheds, either at the national or provincial level or catchment-wide management plans in critical catchments. These often form part of forestry regulations. It typically consists of zonation of forest areas into different protection classes depending on the risks of breakdown of watershed protection and of the potential consequences of such a breakdown. Areas within the FMU that are vital to maintaining critical water catchments may already have been identified during management planning, either to comply with forestry regulations or with best practise guidelines. The prioritisation scheme will normally be in the form of maps or simple criteria (such as minimum slope in particular areas of the country). Areas of the FMU that are mapped or that meet the criteria should be identified. Where several such plans exist, the most recent and/or most widely used scheme should be selected. If you have good reason to believe that there are serious flaws in the scheme (i.e., if it is an old scheme that does not reflect recent major changes in forest cover or if you believe that it does not reflect the necessary aspects of the HCV (as discussed in Part 1 Section 2.4), advice should be sought from independent stakeholders. *If no such prioritisation schemes exist, go to step 4.1.2*
	If all or part of the FMU falls within the highest protection category, then this will normally be considered HCVF. If not, this HCV is not present within the FMU.
Information sources	National forestry regulations, government catchment zonation systems, or catchment-wide management plans should be available from national or provincial government agencies or bilateral agencies
4.1.2 Identify whether the FMU is within a critical catchment	
Guidance	These might include catchments with a high risk of catastrophic flooding or drought or that provide critical supplies for reservoirs, irrigation, river recharge, hydroelectric schemes, that protect fisheries or that are critical to the ecological functioning of protected areas[24]. *Go to step 4.1.3*

[24] The management plans of protected areas sometimes include an assessment of potentially degrading external impacts (e.g. a requirement of management plans for Natura 2000 sites). In addition, there may be some types of protected areas that are intrinsically prone to degradation by activities occurring outside their borders (e.g. protected areas of peat swamp forest in Indonesia, protected areas that are dependant on protection of riverine forests).

Information sources	Information on areas that are prone to serious flooding or drought either historically or in recent years, or that are critical to maintain important supplies for reservoirs, irrigation, river recharge, hydroelectric schemes and fisheries as well as hydrological maps should be available from national or provincial government departments or agencies.
4.1.3 Assume that at least part of the FMU is HCVF unless it can be demonstrated that it is not critical to protection of the catchment	
Guidance	Indications that an FMU may not play a critical role in protecting the catchment might include: • If the catchment is still largely forested • If the FMU covers a very small proportion of the catchment If there is doubt that the FMU is critical to maintaining the watershed functions of the catchment, it will be important to check this conclusion with independent experts. *If your FMU does play a critical role in the catchment, go to 4.1.4* *If your FMU does not play a critical role, this HCV is not present within the FMU.*
Information sources	Independent experts from relevant government departments, research institutions etc
4.1.4 Delineate the HCVF	
Guidance	The HCVF will be the area of forest that is critical to maintaining the watershed function of the critical catchment. In this case, the HCVF can effectively be delineated through management proscriptions that are at least as precautionary as any existing forestry legislation and that are developed in consultation with independent experts.
	In many countries there are regulations about tree harvesting near streams, even if there is no prioritisation scheme. For HCVFs, such proscriptions may not be sufficient, but the HCVF can nevertheless be defined in terms of management. For example a 'no harvest' zone around any water course plus a 'special management' buffer zone around this where harvesting is more limited than in the rest of the forest could constitute the HCVF.
Information sources	Independent experts from relevant government departments, research institutions etc

2.4.2. HCV4.2 Forests critical to erosion control

Forests are often important in maintaining terrain stability, including control of erosion, landslides and avalanches. Most standards for responsible forest management take this into account. In some cases, though, the risks of severe erosion, landslides and avalanches are extremely high and the consequences, in terms of loss of productive land, damage to ecosystems, property or loss of human life, are potentially catastrophic. In these cases, the ecosystem service provided by the forest is critical, and it is these that should be designated HCVFs.

4.2.1 Identify whether all or part of the FMU is identified as being critical to erosion control by an existing erosion protection prioritisation scheme	
Guidance	Most countries have a system for identifying areas that are critical to erosion control and terrain stability, either at the national or provincial level or more locally for critical areas. These often form part of forestry regulations. It typically consists of zonation of forest areas into different erosion protection classes depending on the risks of serious erosion and on the potential consequences of such erosion. Areas critical to erosion control may already have been identified during management planning for the FMU, either to comply with forestry regulations or with best practice guidelines. The prioritisation scheme should either be in the form of maps or simple criteria (such as minimum slope). Areas of the FMU that are mapped or that meet the criteria should be identified. Where several such plans exist, the most recent and/or most widely used scheme should be selected. If you have good reason to believe that there are serious flaws in the scheme (i.e., if it is an old scheme that does not reflect recent major changes in forest cover or if you believe that it does not reflect the necessary aspects of the HCV (as discussed in Part 1 Section 2.4), advice should be sought from independent stakeholders. *If no such prioritisation scheme exists, go to step 4.2.2*
	If all or part of the FMU falls within the highest protection category, then this will normally be considered HCVF. If not, this HCV is not present within the FMU.
Information sources	National forestry regulations or technical norms, national or provincial government departments and maps as well as consultation with relevant experts.
4.2.2 Identify whether the FMU is within a critical erosion area	
Guidance	Critical erosion areas would include where there is a risk of serious erosion, landslides and avalanches. These will be areas with a history of

	serious erosion or terrain instability or where the soils, geology and slope make the terrain vulnerable and where the impacts of severe erosion and terrain instability might include loss of productive agricultural land, damage to ecosystems or property or loss of human life. *Go to step 4.2.3*
Information sources	Information on areas that are prone to serious erosion or avalanches either historically or in recent years, and where the consequences of these are catastrophic should be available from government departments or governmental agencies.
4.2.3 Assume that at least part of the FMU is HCVF unless it can be demonstrated that it is not critical	
Guidance	Indications that an FMU may not play a critical role in protecting against erosion and terrain instability include: • if the FMU is contains only a small area of vulnerable soils or slopes • if the particular topographic situation of the FMU protects it from potentially severe, erosion inducing rains If there is doubt that the FMU is critical to protecting against severe or catastrophic erosion, it will be important to check this with independent experts. *If your FMU does play a critical role in the erosion protection, go to 4.2.4* *If not, this HCV is not present within the FMU*
Information sources	Independent experts from relevant government departments, research institutions etc
4.2.4 Delineate the HCVF	
Guidance	The HCVF will be the area of forest that is critical to controlling severe erosion or terrain instability. The HCVF can effectively be delineated through management proscriptions that are at least as precautionary as any existing forestry legislation and that are developed in consultation with independent experts.
	In many countries there are regulations governing erosion control and terrain stability, even if there is no prioritisation scheme. For HCVFs, such management proscriptions will not always be sufficient, but the HCVF can nevertheless be defined in terms of management. For example, slopes greater than a certain steepness could be taken out of the harvesting land base.
Information sources	Independent experts from relevant government departments, research institutions etc

2.4.3. HCV4.3 Forests providing critical barriers to destructive fire

This element is not intended to include forests where fire is a natural or normal part of forest ecosystem process: rather, it will include those few forests that provide natural barriers to fire where uncontrolled spread of fire could pose a serious risk to human life and property, economic activity, or to threatened ecosystems or species. Examples of forests that provide natural barriers to fide include natural strips of broadleaved forest found in areas of eucalypt forest in Australia or in tropical pine forests.

4.3.1 Determine whether all or part of the FMU is identified by an appropriate existing fire protection prioritisation scheme	
Guidance	Many countries that are at risk from catastrophic fires have a system for identifying forests that are critical controlling fire either at the national or provincial level or more locally for critical areas. This is often part of the national forestry regulations. These will typically designate areas of forest around vulnerable towns, protected areas etc, as protection forests. It is likely that critical fire protection areas have already been identified during management planning for the FMU, either to comply with forestry regulations or with best practice guidelines. The prioritisation scheme should either be in the form of maps or simple criteria (such as particular forest types and the minimum area of them that qualifies). Areas of the FMU that are mapped or that meet the criteria should be identified. Where several such plans exist, the most recent and/or most widely used scheme should be selected. If you have good reason to believe that there are serious flaws in the scheme (e.g., it concerns only general fire protection rather than defining forests that form natural barriers to fire in critical situations - as discussed in Part 1 Section 2.4), advice should be sought from independent stakeholders. *If no appropriate prioritisation scheme exists, go to step 4.3.2*
	If all or part of the FMU falls within the highest protection category, then this will normally be considered HCVF. If not, this HCV is not present within the FMU.
Information sources	Relevant government agencies and from forest fire experts in research institutions.
4.3.2 Identify whether the FMU is in a region where there is a high risk of uncontrolled, destructive fire	
Guidance	If the FMU is in a region that is prone to serious fires either historically or in recent years, then it could potentially be or contain HCVF.

	Specific forest areas or types within these regions, where forests can or do act as a barrier to the spread of uncontrolled, destructive fires should also be identified. *Go to step 4.3.3*
Information sources	Government agencies and forest fire experts in research institutions.
4.3.3 Assume that at least part of the FMU is HCVF unless it can be demonstrated that it is not critical	
Guidance	Forests with in the high risk areas identified in step 4.3.4 will be normally assumed to contain this HCV unless: • they do not contain forest types that naturally acts as a barrier to fire; • the area covered by these forest types are too small to act as barriers against uncontrolled destructive fire; • there are no human settlements or communities within or adjacent to the FMU; • there are no places of important cultural value that (e.g. sacred places, archaeological sites) within or are adjacent to the FMU; • there are no protected areas that contain threatened or endangered species or ecosystems within or are adjacent to the FMU. If there is doubt that the FMU is critical to protecting against uncontrolled, destructive fire, it will be important to check this with independent experts.
	The HCVF will be the area of forest that is critical to controlling potentially catastrophic fire. If none of the FMU plays a critical role, this HCV is not present within the FMU
Information sources	Provincial or local government agencies, independent experts from research institutions

2.5. HCV5. Forest areas fundamental to meeting basic needs of local communities

Forests can supply a huge range of basic needs to local communities. However, we deal with the various elements of this HCV together, because the basic issues that the working group will have to decide, which include defining what constitutes a 'basic need' and what constitutes 'fundamental', will be the same whether the value in question is water for daily use, food, fuel, or construction materials, etc.

This HCV is different from the biological and environmental HCVs because its deciding whether a basic need is 'fundamental' ultimately requires consultation with the local communities who use the forest.

We suggest that the forest manager first performs a rapid 'scoping' exercise for the HCV. This forms steps 5.1-5.3 in the table below. The purpose of this is to determine whether or not the HCV is potentially present within the FMU in a rapid and efficient way. If the results of the scoping suggest that the HCV is potentially present, then detailed consultation may be required, if not, then the HCV is unlikely to be present. If there is any reasonable doubt about whether or not the value, fuller consultation with the communities in question is required.

5.1 Is the FMU used by any local communities?	
Guidance	The forest manager may well already be aware of forest use by local communities. If not, possible indicators that the forest might provide important resources to local communities include: • the presence, within or near the FMU, of any peoples in voluntary isolation, indigenous peoples, self-governing local communities or other ethnic groups that are typically dependent on the forest for their livelihoods; • the presence of any such groups within the wider landscape who may use the FMU at times; • groups with traditional land use rights claims covering all or part of the FMU. *If one or more such groups exist, go to step 5.2* *If no such group exists, this HCV is not present*
Information sources	Maps of settlements, local knowledge
5.2 Is the FMU likely to provide one or more 'basic needs' to these communities?	

Guidance	Potential basic needs include, but are not limited to: water for drinking and other daily uses; food, medicine, fuel, fodder, building and craft materials, unique sources of water for drinking and other daily uses, protection of agricultural plots against adverse microclimate (e.g., wind, snow or dust deposition). Forest use that is not a basic need of a community includes: people hunting or gathering food largely for recreational purposes (even if they do eat their catch), forest used for other recreation activities (e.g. walking) etc. *If the forest could potentially provides basic needs, go to step 5.3.* *If not, the HCV is not present within the FMU*
Information sources	Local knowledge, government agencies responsible for indigenous or rural affairs, anthropologists and social scientists in local universities and research institutes, social NGOs
5.3 Does the FMU potentially provide irreplaceable levels of these resources?	
Guidance	For resources that are dispersed (e.g., game, medicinal plants, construction materials) the FMU should be considered to potentially contain this HCVF unless it is a small forest in a largely forested landscape. For resources that are specific to particular sites (e.g., streams that could be used by a community for their daily water uses, unusually dense patches of a medicinal plant, forests protecting agricultural plots against adverse microclimatic conditions), the FMU should be considered to potentially contain this HCVF unless there is a clear alternative source available to the community (e.g. a tube well) that is just as accessible to *all members* of the community. If there is any doubt, then the forest manager should assume that the HCV is potentially present and conduct more detailed consultation with the communities in question. *If the forest could potentially be fundamental to the communities, or if the forest manager is unsure, go to step 5.4* *If not, the HCV is not present within the FMU*
Information sources	As for 5.2
5.4 Plan and implement a programme of consultation with the communities in question	

Guidance	The forest manager will have to develop guidance on appropriate consultation methods that will assist forest managers to determine whether forest use is fundamental to the basic needs of the communities. This is discussed more fully in Section 3.2, but it should, as a minimum, cover: **Characterising the community:** different parts of the community may use the forest in different ways, and so finding out about forest use will normally require consultation with different sub-groups. **Consultation methods:** there are many different ways of communicating with communities. The forest manager should consider seeking professional guidance on appropriate forms of consultation. **What information is needed:** various types of information will be required to determine whether forest resources are fundamental to meeting the basic needs of local communities. This would normally include: • What the community use the forest for • Patterns of resource use (how much, when) and alternative sources • What parts of the forest are particularly important for the resource • Whether use of one resource conflicts with the maintenance of another HCV • Whether resource use is sustainable *Go to step 5.5*
Information sources	As for 5.2
5.5 Determine, in consultation with the communities, whether the basic need is fundamental and delineate the HCVF	

	The information gathered through consultation needs to be interpreted to determine whether a basic need is fundamental to the local community. Potential indicators that a forest is fundamental to local communities include when: • A high proportion of the community's need comes from a particular forest; • There are no readily available, affordable and acceptable alternatives; • A community would suffer diminished health or well-being through reduced supply of a resource; • A particular resource is a small proportion of a community's basic needs or is only used occasionally but is nevertheless critical (e.g. when a forest provides a modest proportion of overall food consumed but most of the protein, or when a forest provides famine food or provides a large proportion of food at particular times of year). Conclusions reached should have the agreement of the communities who use the forest.
	If the basic need is fundamental to the community, then decide, in consultation with them, which parts of the FMU are critical to providing this resource. This will be the HCVF. If not, the HCV is not present within the FMU

2.6. HCV6. Forest areas critical to local communities' traditional cultural identity

We deal with the various components of this HCV together, because the basic issues that the forest manager will have to decide, which include defining what constitutes 'critical', will be the same whether the value in question is cultural, religious etc.

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. Ultimately, it will only be possible to decide this in consultation with the community or communities in question.

We suggest that the forest manager first performs a rapid 'scoping' exercise for the HCV. This forms step 6.1 in the table below. The purpose of this is to determine whether or not the HCV is potentially present within the FMU in a rapid and efficient way. If the results of the scoping suggest that the HCV is potentially present, then detailed consultation may be required, if not, then the HCV is unlikely to be present. If there is any reasonable doubt about whether the or not the value, fuller consultation with the communities in question is required.

Because of the shared requirement of consultation for HCV5 and HCV6, it will usually be more convenient for forest managers to examine them together.

6.1 Identify cultural groups that are likely to have a strong cultural association with forests	
Guidance	The forest manager may well already be aware that the FMU contains features of cultural significance for one or more local communities. If not, indicators that the forest might provide important resources to local communities include: • the presence, within or near the FMU, of any peoples in voluntary isolation, indigenous peoples, self-governing local communities, communities that are dependent on the forest for their livelihoods as well as groups that are known to have strong cultural links with forest; • the presence of any such groups within the wider landscape who may use the FMU for cultural reasons at times; • traditional land use rights claims covering all or part of the FMU. *If one or more such groups exist, the HCV is potentially present, go to step 6.2* *If no such group exists, this HCV is not present*
Information sources	Indigenous people's organisations, maps of indigenous lands, government

	agencies with responsibility for indigenous groups or for rural development, professional social scientists and anthropologists with local expertise, representatives of cultural and community groups.
6.2 Plan and implement a programme of consultation with the communities in question	
Guidance	The forest manager will have to develop guidance on appropriate consultation methods that will assist forest managers to determine whether forest use is critical to the traditional cultural identity the communities. This is discussed more fully in Section 3.2, but it should, as a minimum, cover: **Characterising the community:** different parts of the community may have different cultural associations with the forest, and so consultation with different sub-groups will normally be required. **Consultation methods:** there are many different ways of communicating with communities. The forest manager should consider seeking professional guidance on appropriate forms of consultation. **What information is needed:** various types of information will be required to determine whether a forest is critical to the traditional cultural identity of local communities. This would normally include: • Indicators of potential cultural significance, which might include sacred or religious sites, specific areas that have historically been actively governed and regulated, specific areas with remnants from the past linked to the identity of the group (e.g., statues, megaliths etc), frequent use of forest products/materials for artistic, traditional, and social status purposes, names for landscape features, stories about the forest, historical associations, amenity or aesthetic value; • How long the community has been associated with a particular forest. *Go step 6.3*
6.3 Determine, in consultation with the communities, whether the forest is critical to the cultural identity of the community and delineate the HCVF	
Guidance	The information gathered through consultation needs to be interpreted to determine whether a cultural association is critical to the culture of the local community. Possible indicators include: • When change to a forest can potentially cause an irreversible change to traditional local culture (e.g., temples, sacred burial grounds or sites linked to particular cultural or religious activities) • When a particular forest provides a cultural value that is unique or irreplaceable of a forest (e.g. when a forest is used to gather materials for artistic, traditional, and social status purposes that are not present in, or available from, other local forests);

	• When a value is 'traditional' to a community. Where a community has been associated with a particular forest for hundreds of years, then they are clearly traditional. When the community has arrived more recently, this becomes less clear. Conclusions reached should have the agreement of the communities who use the forest.
	If the basic need is fundamental to the community, then decide, in consultation with them, which parts of the FMU are critical to providing this resource. This will be the HCVF. If not, the HCV is not present within the FMU

3. Consulting stakeholders in HCVF identification and management

HCVFs are, by definition, the most outstanding or critical forests. It is therefore important that a wide range of opinions and knowledge is used when identifying them; developing management regimes for their maintenance; and in reviewing the effectiveness of the management. Involvement of stakeholders in these processes has at least two major advantages:

- Calling on a wide range of experience and knowledge provides a greater degree of certainty that identification and management decisions are suitable.
- Involvement of interested stakeholders provides greater assurances to society that the HCVs are being dealt with in an appropriate manner.

The importance of stakeholder involvement is encapsulated in FSC Criterion 9.2 (see box).

> ***FSC Criterion 9.2 The consultative portion of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof.***

The HCVF working group may therefore choose to provide forest managers with guidance on what consultation is appropriate to fulfil this criterion (or other similar requirements, if HCVF is being used outside the FSC framework). In this Section we briefly discuss provision of guidance for HCVF identification, management and monitoring. Because consultation is an intrinsic part of identifying HCVs 5 and 6, more detailed consideration is given to these.

3.1. General guidance on HCVF consultation

3.1.1. Who should be consulted?

There are two basic types of stakeholders that would need to be involved in HCVF consultation:

- **Stakeholders directly affected by management.** These would include communities or individuals living in or near to the FMU or that use the forest.
- **Parties with special interest in the HCV** (individuals and organisations). For example, special interest groups for HCV 1.2 (significant concentrations of threatened or endangered species) might include national, provincial and local

government agencies responsible for conservation and environmental NGOs. These would often be the same groups that are potential 'sources of information' given in Section 2.

Forest managers are encouraged to maintain lists of stakeholders and records of communications with them.

3.1.2. How should they be consulted?

There are two basic options for HCVF consultation processes:

- **Informal stakeholder contacts.** This would involve contacting interested stakeholders periodically and inviting opinions on the identification and of the HCVF and the management options for it. These stakeholders would also be kept informed as to the management of the HCVF. This process would be relatively cost-effective and may therefore be the most appropriate model for small, low-impact or community-managed forests. However, there is the risk that some stakeholders may feel (rightly or wrongly) that the forest managers were not addressing their concerns.
- **Stakeholder Management Forum.** This would involve setting up a formal group of interested stakeholders, who would then meet periodically with the forest managers to discuss and advise on the management of the HCVF. Any consensus reached on the management of the HCVF would be incorporated into management planning and actions. The advantages of this approach include: that the involved groups are more likely to provide strong technical and time inputs if they are part of a formal structure; it provides a degree of transparency to the process of consultation; and involved stakeholders know that their opinions are being heard. Disadvantages include increased cost in arranging and facilitating meetings.

3.2. Specific guidance for HCV5 and HCV6

As discussed in Section 2, final identification of these HCVs will always require consultation[25] to determine whether a forest is fundamental to meeting any basic needs

[25] As discussed above, the assessment for both social values is very similar and so the two are best examined together. If there is an interest in FSC certification, then assessment should also be linked to the requirements of Principles 2, 3 and 4. Sources of information:

1. Knowledgeable people and organisations such as NGOs, local community organisations or academic institutions. These types of groups can often provide a quick introduction to the issues and provide support for further work.
2. Literature sources such as reports and peer-reviewed papers, where available, can be very useful sources of information.
3. Consultation with the communities themselves is the most important way of collecting information. This is also a difficult task and may require adequate professional help in

(HCV5) or is critical to the community's cultural identity (HCV6). The way that consultation will be done will be enormously variable, depending on the socio-economic context, and the resources available to the forest manager. 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.

Consultation should include consideration of:

- Looking at members or subgroups rather than treating the community as homogenous.
- Choice of stakeholder groups.
- The best sources of information.
- The consultation techniques that might be appropriate for particular groups.
- Talking with communities and forest managers with experience of this process who are prepared to share this experience with others new to the process.

Some issues which need to be considered

- What to do when a community doesn't have the capacity to engage in consultation
- How to deal with secret knowledge which people won't share
- Is it appropriate to set numerical thresholds – for example that a forest is fundamental to meeting basic needs if a community derives at least x % of its diet from that forest[26]?
- If the forest is very small then it will not usually be appropriate to undertake a major consultation process. Information on consultation processes can be gained from professional social scientists and anthropologists with local expertise.

The consultation process must be adequate to ensure that the information collected is appropriate to both the size and type of forest organisation and the type of community being consulted. Appropriate methods and processes will need to be developed locally, but the following general guidelines are usually followed in consultation:

---

planning and implementing the consultation process to ensure that the necessary information is gathered within an appropriate timeframe.

Further guidance on consultation is provided in Appendix 1.

[26] There are two potential problems with this approach: a) the information may not be readily available and communities may not want to provide information for fear of being charged, taxed or told that what they are doing is illegal; b) it may prove too crude – for example a community may get only 5% of its diet from a forest but this is 100% of its protein making the forest fundamental although the *x %* limit is not reached.

- Consultation is an ongoing, iterative process – not a 'one-off' exercise. Adequate time and effort must be provided to build trust and learn how to communicate effectively.
- The consultation procedure should be planned and, in most cases, documented (at an appropriate level)
- The approach taken to consultation should be culturally appropriate, and this approach should be justified and explained[27].
- Those being consulted must be informed, in a culturally appropriate way, of the purpose of the consultation.
- All relevant stakeholders should be identified and their contact details recorded.
- For consultation with communities it is important to establish
    - the identity of decision-makers within the community (you should adjust your consultation techniques to accommodate these persons)
    - the processes by which decisions are reached and disputes resolved (you should adjust your consultation techniques to accommodate these processes)
    - whether the spokesperson is appropriate/relevant to the decision-making process
    - that all relevant groups, especially marginalized groups and women have a voice
    - whether people are genuinely able to say what they think or whether they are within a context which doesn't allow it (e.g. within a war zone or country or company where free speech is not possible)
- The feedback mechanism should be established and communicated to consultees.
- It is very important to be aware of how questions are asked and information solicited since people may not mention things they take for granted or do not really understand.

  For example, someone asked 'Is the forest critical to your basic needs' may answer 'no' because they find the concept confusing. However, when asked 'where does the river providing your drinking water come from' the reply becomes 'the forest'.

[27] For example, verbal communication should be used for non-literate communities, and this should be done on their terms, by, for instance, attending a scheduled community meeting rather than demanding a time convenient for the forest manager.

4. Managing HCVFs

For many users of this Toolkit, including forest managers and certification auditors, identification of HCVF is only the first stage of a process. They will then need to focus on the implications for management, to ensure that any HCVs within their FMU are maintained or enhanced.

It is not possible to give detailed global guidance on managing HCVF. Instead, we outline some of the basic ideas and processes that should ensure that HCVFs are appropriately managed. This means that forest managers will be able to develop management regimes that maintain any identified HCVs, taking into account the local conditions, resources and knowledge available to them.

FSC Principle 9 requires that forest management must ensure that the identified values are maintained or enhanced, and it seems likely that others using the concept will have similar requirements. This process also needs to be closely integrated with a monitoring programme, which is discussed in Section 5.

FSC Criterion 9.3 The management plan shall include specific and implemented 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.

The key consideration at this stage is that forest management must clearly and demonstrably aim to maintain or enhance **each specific** HCV that has been identified. In practical terms, the area actually designated as a HCVF is the forest that should be managed to ensure that the value(s) are maintained and/or enhanced. For some values, this will be the entire FMU. For others, it will be possible to delineate specific areas of the FMU. Where it is not possible to demonstrate that these areas are sufficient to maintain the identified HCV, then the Precautionary Approach dictates that the whole FMU be considered the HCVF.

High Conservation Value Forest is the area that must be appropriately managed in order to ensure that the identified HCV is maintained and/or enhanced.

Example 1. The FMU contains a rare forest type, defined as an HCV. This ecosystem is confined to a particular geological formation within the FMU. The HCVF would be the part of the FMU occupied by the ecosystem.

Example 2. The FMU contains a suite of endangered mammals, including predators,

primates and ungulates, defined as an HCV. These animals range widely throughout the FMU. The HCVF would be the whole FMU.

4.1. Generic guidance for managing HCVs

This section provides general guidance on managing HCVs, for adaptation at the local level. As with the identification of HCVs, it is not possible to be very specific at a global level, so the guidance will require considerable refinement by forest managers. In some regions and for some HCVs, the management practices necessary to maintain or enhance specific HCVs may be well understood and tried and tested. In other cases, forest managers will have to develop an appropriate management regime using the best available knowledge and information (see box).

How well known are HCVF management practices?

HCVF management tried and tested: the HCVF is an area vital to maintaining a critical watershed (HCV4.1), which is defined under forestry technical norms. These technical norms also have management prescriptions that are known, through the history of their implementation, to adequately maintain the HCV.

HCVF management developed based on available knowledge: if the HCV is a suite of endangered beetles, ecologists might know that their populations are likely to be maintained if the density of dead wood remains above a given threshold beneath a closed canopy. The forest manager may therefore decide that these forests should be selectively logged, with a certain density of trees being high-felled, snags retained and a minimum volume of coarse woody debris left within the stands.

Nevertheless, some guidance is universal, in particular that the management of HCVs should:

- always be based on the precautionary approach to minimise the risk that any irreversible damage is done to these critical values.
- always be within a framework of adaptive management, i.e. by planning, implementation, monitoring of effects and where necessary re-planning on the basis of the analysis of the results of monitoring.

In general, the management planning process that any forest manager should go through is:

- **Identify all HCVs** and record this in the management planning documents, wherever possible mapping or otherwise delineating their location and extent. This will sometimes be an on-going process. This information will normally be made publicly

available, but may be for confidential use by forest managers and certification auditors as appropriate. For example, it may not be desirable to make public the location of nest sites of an endangered bird in regions where egg collectors or trophy hunters pose a risk to the species. Similarly, local communities may not want to make the location of cultural HCVs (such as sacred burial grounds) publicly available, and these wishes should be respected.

- Collate/compile all relevant, available **baseline information** for each identified HCV, including:
  - relevant legislative requirements or constraints (including both national legislation and international conventions),
  - current status, trends and threats to the HCV
  - known impacts of forest management (including the adequacy of current management).

Example: The identified HCV is a rare forest ecosystem, including dependent fauna, present in patches across the FMU, and currently managed by very low-intensity harvesting of selected species. Information would need to be collated about the current national (or regional) status of the ecosystem, current condition of all areas of the ecosystem within the FMU, including past use and existing levels of degradation, threats such as poor harvesting practice, fire and collection of medicinal plants, and critical management requirements such as the need to ensure fire control to protect regeneration of key tree species.

- Detail the **management regime** for each HCV. The management regime would fulfil the site-specific objective of maintaining or enhancing the HCV within the defined HCVF area. The main types of options for management are:
  - **Protection** of the area, through reserves, buffer zones, marking boundaries and control of activities that degrade the HCV (e.g. hunting of rare species). Where doubt exists as to whether any of the other management options are able to maintain or enhance the identified HCVs, then, consistent with the precautionary approach, protection will be the preferred option.
  - **Modifications or constraints on operations**, or specific operational prescriptions/systems. Any threats to the HCVs which will be posed by operations or other activities in the forest will need to be identified and documented. This analysis should include all potential effects, both direct (e.g. harvesting operations or use of chemicals) and indirect (e.g. increased hunting as a result of better access along logging roads). The constraints that these threats will put on operations and other activities should also be examined. The decision to adopt

any particular operation must be made based on the precautionary approach (see box), which means that if you are not sure whether a particular activity might have a negative effect on a HCV, then you should assume that it will until you have collected information to prove that it doesn't. Examples of modified management regimes might include implementation of particular cutting cycles, retention of named species or maximizing notable habitat features such as areas suitable for nesting or feeding.

- **Restoration** activities where the forest area requires some remedial action, such as removal of alien species or enrichment of riparian functions.

The optimal management regime may be some combination of these approaches, depending on what is appropriate for the HCV on that specific site.

The 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 HCV 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).

- **Integrate** HCVF management into the broader forest management process. The management planning documents should set out the details of which measures and operations will be undertaken, and how, ensuring that nothing which is planned will have a negative impact on another of the identified HCVs. The plans should be justified using the best available technical and scientific information, as well as experience and traditional knowledge. For those implementing FSC requirements, descriptions of each HCV, and the management activities proposed to maintain or enhance them, should be included in the public summary of the management plan.

- **Training**. It will almost certainly be necessary to design and carry out a training programme for all operators to ensure that they fully understand the management proposals and their importance.

A programme for **monitoring** each HCV will need to be implemented to ensure that it is being maintained or enhanced (this is discussed in further detail in Section 4). As a part of this, routine monitoring of the planned measures and operations should be carried out to ensure they are being done properly[28]. Regular reviews, where the results of the monitoring programme are fed into management planning and, where appropriate, the management plan is revised, will also need to be conducted.

The general guidance described above should be followed for each of the HCVs identified. In addition, there are some recommendations that are specific to each of the six types of HCV.

It is also important to remember that management regimes may include measures that are taken at a range of scales (e.g. landscape or stand level), depending on the specific value. This is discussed under the different HCV types.

4.1.1. HCVs1 & 3: Requirements for 'concentration of biodiversity' and 'rare, threatened or endangered ecosystems'

1. Identify whether there are any constraints placed on management of the forest or HCV by law. For example, if it is within a protected area, or contains a species covered by either national legislation (e.g. wildlife laws) or by international conventions (e.g. if the species is listed by CITES or on IUCN Red Data Lists).
2. For each HCV, identify key baseline information, including current status, main trends and threats, and management impacts. This should include an evaluation of the impacts and adequacy of current management.
3. 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 provision of standing deadwood or riparian zone protection.
4. Integrate the management proposals into the broader planning process and ensure that measures are actually implemented, for example through changing operational procedures and ensuring that a training programme has been completed.

[28] Note that monitoring management activities is a separate requirement from monitoring the continued status of the HCVs. Both types of monitoring are needed for HCVFs.

5. The following activities are recommended but will not always be necessary or relevant, depending on the size and intensity of forest management and the nature of the HCVs identified:

    - As much relevant information on the biology of species or the ecological processes that are relevant to the HCV should be collected as possible. This is needed to devise sound management practices to ensure their long-term protection.
    - Conservation and management activities should be coordinated with other owners and stakeholders in the landscape when this is required to maintain or enhance the HCV.

4.1.2. HCV2: Requirements for 'large, landscape level forest'

1. Consider management actions at different spatial levels: namely at the stand level and the landscape level. The landscape level may involve thinking about factors that extend beyond the specific forest management unit (FMU). The general management aim will be to maintain viable populations of most if not all naturally occurring species. However, forest managers will usually only be able to manage habitat, rather than the species themselves. This requires an understanding of the effects of interventions at different spatial scales. For example:

    Stand-level: (a) ensuring natural regeneration of some native trees species may require that the forest canopy is not opened beyond certain limits;

    (b) forest interior herbs will be out-competed by more light demanding species and may become extinct within the stand if the forest canopy is opened beyond certain limits during harvesting;

    (c) utilising reduced impact logging (RIL) techniques to reduce soil compaction and reduce unnecessary damage to tree regeneration;

    (d) reducing fuel loading and ignition potentials in forests exposed to fire risks.

    Landscape-level: (a) species with low dispersal ability (such as many forest interior herbs) may not be able to spread beyond a single stand if the forest habitat is fragmented by excessive roads or by large areas of clear-cut;

    (b) species that avoid roads (e.g. woodland caribou) may be have their ranges effectively reduced unless road construction and decommissioning is adequately planned

(c) species that require certain forest elements for part of their life-cycle may be reduced in population size or become extinct if a certain proportion of these habitats are not maintained within the FMU as a whole.

(d) species that require different landscape elements at different times of year (such as lowland forest and montane forest) may be adversely affected by inappropriate management of just one of these.

2. Identify whether there are any legal constraints or requirements placed on management of the forest or HCV.

3. For each HCV, the forest management plan should identify the outstanding features and characteristics of the forest that are critical to maintaining viable populations of species at the landscape and stand levels. It is necessary to identify key baseline information, including current status, main trends and threats, and management impacts. This should include an evaluation of the impacts and adequacy of current management.

For example, map and/or describe the composition of forest habitat types within the FMU (species composition and structure). You should also map and/or describe the size, frequency and intensity of natural disturbance patterns found within the FMU, and map the current level of effective connectivity between habitat types.

4. Draw up specific management proposals for the HCV. This may include active management and/or strict protection as appropriate. Management strategies for landscape level forest HCVs can be approached in a number of ways. Two options for thinking about this are to either define a range of 'coarse-filter' management actions at both landscape and stand level, or to assess the habitat requirements and management needs of one or more functional groups of organism. These approaches are explained further in the boxes below.

Coarse and fine filter management

A 'coarse-filter' management strategy for a forest is designed to maintain or enhance the overall quality or naturalness of the forest. An example could be a forest area where the natural disturbance regime is based on small-scale disturbance events. Management measures at the landscape scale to maintain the HCV would be focused on maintaining high levels of late seral stage forest, large areas with forest interior conditions, and connectivity between such areas. In addition, a range of measures at the stand level would be implemented, and would concentrate on factors such as planning and implementing harvesting to limit canopy openings to within a particular size, structural diversity and retention levels, species diversity, deadwood, the shrub/herb layers and the forest floor.

A 'fine-filter' management strategy might take into account the specific needs of particular functional groups of organisms. 'Functional groups' are taken to mean groups of organisms that are dependent on forest connectivity at different scales. For example, the abundance and diversity and forest interior herbs may reflect fragmentation processes at the stand level. In this, case the, degree of canopy opening might be an effective indicator the effective management of this 'functional group', and the forest manager might wish to establish target limits of canopy openness that can be monitored by rapid direct or indirect methods. An example of a functional group that requires landscape-level connectivity extending beyond the FMU might be ungulates that seasonally migrate between lowland and montane forest within the FMU and alpine pastures bordering the FMU. The critical ecosystem feature in this case would be access between these areas. The forest manager could then seek to ensure that fences or permanent roads did not obstruct this movement.

5. Integrate management proposals into the broader planning process and ensure that measures are actually implemented, for example through landscape-level plans, changing operational procedures and ensuring that a training programme has been completed. Where possible, contribute to the maintenance of important landscape elements outside the FMU (e.g. where the FMU is a large barrier to fire or to exotic, invasive species).

4.1.3. HCV4: Requirements for 'basic services in critical situations'

1. Describe each basic service in critical situations. Do any areas have legal protection (e.g., designated community watersheds) legal constraints on their management from forestry technical norms? Collate all the relevant baseline information, such as

information on catchment areas, mapping or classification of gradients, soil types and terrain stability.

2. Identify those areas or communities to which each basic service is critical.
3. Estimate the consequences of catastrophic or serious cumulative impacts on these services for each area or community. Identify key management impacts and information. This should include an evaluation of the impacts and adequacy of current management.
4. Identify the important threats to these features and characteristics and make sure that management does not create or increase them.
5. Draw up specific management proposals for each HCV. This may include active management, restoration measures or strict protection as appropriate. Integrate the management proposals into the broader planning process and ensure that measures are actually implemented.
6. The following activities are recommended but will not always be necessary or relevant, depending on the size and intensity of forest management and the nature of the HCVs identified:
    - As much useful information as necessary should be collected on the ecological processes that maintain the basic services HCV's, so that sound management practices can be devised to ensure their long-term continuation.
    - Conservation and management activities should be coordinated with other owners and stakeholders in the landscape when this is required to maintain or enhance the HCV attribute.

4.1.4. HCV5 & 6: Requirements for social and cultural HCVs

1. Describe all communities to which the identified social and cultural HCVs apply.
2. Describe the fundamental basic needs or critical cultural attributes.
3. Describe, using the best sources of information possible, the relationship of each community with each of the identified HCVs.
4. In collaboration with the communities, map and/or describe the areas of the forest that provide HCVs to the communities. Due consideration must be taken of communities' concerns of confidentiality of information.
5. Develop a plan for continuous consultation with the community (see Section 3).
6. Aspects of management planning that are relevant to the identified HCVs should be defined in collaboration with the affected communities in a way that respects and preserves customary practices of decision-making processes and knowledge maintenance of the community.

Example: Where local communities have decision-making processes that work at a different speed from those of the forest company, the company will need to adapt to the community process.

7. Communities should be allowed the right to choose their own representatives and advisors to be involved in the management planning process.

   Issues that may need to be addressed are:

   - guaranteeing access rights and use rights
   - community involvement in decision-making that is fully representative, makes use of peoples' own representative institutions and which includes marginal groups.
   - ensuring availability of resources over time

8. For FSC certification, a publicly available management plan summary must be available in English or Spanish on a certifier's web site. Where relevant, the summary should also be available in the local language. In addition, this should be communicated to the affected communities in a culturally appropriate way that may mean:

   - use of non-technical words and phrasing which is easily accessible
   - translation into the/a local language
   - verbal communication where communities are not literate.

   Where the community has specific concerns about confidentiality of information (e.g. sacred sites), these need not be included in the publicly available summary.

5. Monitoring HCVs

Monitoring HCVs is an essential part of management. The main purpose of monitoring is to establish whether or not the identified HCV is being maintained or enhanced. Monitoring allows the forest manager to check whether management is working and, if it is not, to warn when management must change.

Monitoring of HCVs will mostly be concerned with monitoring within the FMU, although some of these monitoring requirements may also require consideration of events that occur outside the FMU where these effect the identified HCV (e.g. changes to the conservation status of ecosystem types, provision of alternative drinking water sources to local communities). Other stakeholders, such as land-use planners, may need to monitor HCVs at a landscape scale, but this is not specifically addressed here.

The link between management and monitoring is made very clearly by the FSC requirements for HCVF in Principle 9, (Criterion 9.4).

> ***Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.***
>
> ***FSC Criterion 9.4***

Monitoring is an activity that is commonly misunderstood, and the monitoring requirements for HCVs are unlikely to be an exception to this. The guidance provided here is generic, but concentrates on the processes that are likely to result in the implementation of an appropriate monitoring programme. Section 5.1 provides general guidance on monitoring HCVs, while Section 5.2 goes identifies some specific requirements for each of the six types of HCV.

5.1. Generic guidance for monitoring HCVs

The purpose of monitoring is to make sure that any changes in the identified HCVs are noticed. This then allows action to be taken if the change is negative, which in turn means that the requirement to maintain or enhance the value can be met.

In addition to monitoring that each HCV is being maintained or enhanced, it is also advisable to monitor that the proposed management measures are actually being carried out as planned. This is often called 'operational' monitoring. For example, it is common to monitor that harvesting operations are following the required procedures. This helps to identify any obvious problems before they may actually be detected from the results of a longer-term (or 'strategic') monitoring programme.

When developing any monitoring programme, the following step-wise procedure should be followed: selection of indicators, design of the programme, and review of the results.

5.1.1. What indicators should be selected for monitoring?

The basic requirement for monitoring a HCV is to find one or more indicators that can be regularly measured to see whether or not there has been a change. At least one, and usually more than one indicator will be needed for each identified HCV. Anything measurable can in theory be an indicator. For example:

- Wildlife populations, such as the number of migratory bird species using a lake each year.
- Social issues, such as the income local people derive from collecting non-timber forest products.
- Other environmental factors including water quality, soil erosion or measures of forest regeneration.

In general the following should be considered when selecting indicators:

- **Measurable**: in order to be able to check changes in the indicator it is necessary to measure it on a regular basis (e.g. every month or every year). To make this as simple as possible it is preferable if indicators are quantitative (for example, the number of nests of an HCV bird species nesting in the forest area). However, this is sometimes not possible and it may be necessary to use descriptive or qualitative indicators (for example, surveys of peoples' perceptions of the impact of operations on their sacred sites). If qualitative indicators are being used, it is important to plan in advance how changes will be identified.
- **Straightforward**: indicators should be as simple to understand and to measure as possible, since this minimises the risk of mistakes being made. This is not always possible since some HCVs require relatively complex indicators, but wherever there is a choice of indicators always chose the more straightforward ones.
- **Cost-effective**: it is risky to say that indicators should be chosen which are cheap to measure, because this is not always possible. But the cheaper the indicator in terms of both direct costs (e.g. paying specialists, buying information such as satellite images) and indirect costs (e.g. staff time, use of vehicles), the more likely it is that the monitoring will be implemented in the long term. Very expensive monitoring programmes are often the first to be sacrificed when times are hard and savings need to be made.
- **Time**: there are two important issues to do with time that should be taken into account. Firstly, it is important to decide how often the indicators need to be measured right from the start and make sure that there are adequate resources

available. The appropriate frequency of monitoring is discussed in the following section. Secondly, the quicker and easier it is to collect the information needed for an indicator, the more likely it is that the work will be done.

- **Appropriate:** In addition to all the above, it is also ***critically important*** to be sure that the indicator is appropriate and effective in measuring the HCV. Often, in an effort to keep indicators quantitative, straightforward, cheap and easy, people measure things which do not actually provide particularly useful information on whether or not the value is being maintained.

> Example. The identified HCV is an extremely rare, endemic species of eagle whose numbers are very low. The management goal will be to ensure that the population size is being maintained or increased. One aspect of this is successful breeding. In this case a possible indicator is the number of nests. This is practical and relatively easy to monitor because its nests are large and conspicuous. It is quantitative so it will be easy to track changes.
>
> However, the maintenance of the population is not only dependent on adults building nests, but also on them laying eggs, hatching the chicks and successfully bringing the chicks up to a point of independence. In fact, as a result of disturbance, the adults could be failing to hatch any chicks, or because of a reduction in food available, failing to raise them to maturity. Therefore, the number of nests is only an adequate indicator if it is known that it is definitely correlated to the number of chicks that successfully reach adulthood.

5.1.2. Designing the monitoring programme

Once the indicators have been chosen, the next step is to develop a monitoring programme incorporating the indicators. This programme should set out:

- **How to decide when a change has occurred**: it is sensible to think right from the beginning for each indicator how to decide whether a change has occurred since this will impact the entire monitoring programme planning.

  The first time or first few times that the indicator is measured will provide a baseline of the level of the indicator. Management will then aim to maintain or enhance these levels of the indicator. Most indicators are likely to vary slightly with natural changes in the value being measured. For example, if the number of nests is being monitored each year, there are likely to be small changes due to natural processes. So a

decision must be made about exactly what size or type of change is significant and would indicate that there is a real impact on the value. This will then affect all the other decisions about how and when measurements are made.

Change can be assessed either in relation to an area where no harvesting is occurring (a set aside area or nearby protected area that contains similar forest to the FMU) or in relation to the state of the harvested area before harvesting began (if sufficient pre-harvest monitoring has been done).

Where management of an HCV includes a programme of intensive restoration of the value, the indicators should be selected to show levels of recovery, so that it becomes clear when intensive management can be reduced.

- **What information is needed**: be very clear about precisely what information is being collected. In many monitoring programmes people end up collecting a lot of data that they don't really need and don't know how to use 'just in case' it proves useful. It seldom does so, and usually it is better to collect just the information which is needed. However, if it is possible to collect additional useful information while undertaking monitoring, then this is fine.
- **How each indicator will be measured**: when selecting indicators some thought will already have been put into deciding how each one will be measured. However, it is now necessary to plan in detail how measurements will be made. The purpose of monitoring is to look for changes that can then inform management decisions and practises. The methods that you use for monitoring should therefore be consistent, because different monitoring methods can give different results. Repeated change to the monitoring programme can therefore lead to apparent changes in the HCV that are an artefact of the changes of methodology rather than a reflection of real change in the value. Therefore, careful thought at the start is essential. This will often require input from specialists from local research institutes, universities etc. Simple measures of inter- & intra-observer reliability will also help to ensure consistency in data collection.

  Wherever possible, try to design methods that fit in with other activities, or which can be used to collect information for more than one indicator at once. This will save time and money. For example, it may be possible to incorporate monitoring of levels of coarse woody debris into a post-harvesting regeneration inventory.
- **Who is responsible for making the measurements**: there should be clear responsibility for monitoring each indicator. This should include responsibility for training the individuals who are taking measurements in the field, planning monitoring activities, making sure that they are conducted and making sure that the results are analysed. If external consultants are doing some of the work then someone within the forest organisation should be responsible for ensuring that this happens.

- **How often the measurements will be made**: a key issue is to decide how often the measurements should be made. This decision needs to be based on:
    - The speed with which change might occur to the indicator. For example, if birds nests are being monitored then there is no point in monitoring more than once per year since nests are only built once a year. On the other hand, if the sediment load of a river is the indicator it might be necessary to measure during each big storm.
    - FSC Criterion 9.4 specifies that monitoring HCVs must be annual. However, annual monitoring is not necessarily appropriate to all HCVs and HCVFs (see example), and so we interpret this as meaning that '*monitoring should take place with a frequency relevant to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes and this should be reviewed at least annually*'.

Example of a HCVF monitoring protocol in which different components are monitored at different frequencies

HCV: the sole source of drinking water for a local community, which is supplied by a stream arising in the forest management unit (HCV5).

HCVF: a riparian protection zone where no harvesting takes place, plus a further buffer zone around this where harvesting is limited (in terms of the density of trees taken, plus further requirements on directional felling and skidding).

Monitoring Programme: The operational monitoring would include checking that the strict protection zone was respected and that harvesting in the buffer zone followed the management guidelines. Clearly, it would only make sense to do this monitoring during harvesting and therefore it would only need to be done annually if some harvesting operations were taking place each year in the buffer zone. The strategic monitoring could include monitoring water flow and sediment load as well as consultation with local villagers to ensure that their needs were being addressed. The key times for monitoring water flow and sediment load would be when water flow was at its highest (e.g., after storms) and lowest (during periods of prolonged drought), which is will be more frequent than annual. Consultation with the community could involve frequent, informal talks with the village health worker (to find if there were any outbreaks of water-borne diseases) as well as more formal discussions with the community (which could be conducted annually unless a problem arose).

Review of results: Discussions with the community annually or immediately if a serious reduction in water flow and quality was identified or following a significant increase in the incidence of water-borne disease.

- **How the data collected will be analysed:** this is the process by which the data that has been collected is converted into useful information, to enable conclusions to be drawn about the effectiveness of management. One of the most common problems with monitoring is that although people collect data they don't analyse it. Data by itself is useless and you may as well not bother collecting it if it is not going to be analysed. Therefore, how the data will be analysed, who will be responsible for doing it and how quickly it will be done after the data have been collected should all be planned in advance.

5.1.3. Reviewing the results.

As soon as the data have been analysed, the results need to be reviewed to see what the indicator is telling you. This needs to be set up as a formal programme with regular dates set for carrying out these reviews (these dates are also useful in setting deadlines for those collecting and analysing data on the indicators).

In a large organisation, the review should include both senior management and the main people responsible for implementing the monitoring programme. For small forest owners it may be simply a day when the owner has a note in his or her diary to spend an hour checking the monitoring data.

For each indicator the review should check:

- Are the planned measurements being made and the results analysed?
- Do the results indicate any change to the HCV?
- What are the implications for management?

If the planned measurements are not being made it is essential to establish why not and to take action to make sure future measurements will be carried out as planned. For particularly sensitive values it may be necessary to make a measurement immediately to confirm that there has not been a degradation of the HCV while the monitoring programme was not being implemented.

If the results indicate a negative change to the HCV then **immediate action** must be taken since it indicates that a value identified as outstandingly important is being damaged.

This may involve emergency meetings, further analysis of the problem and changes to operating procedures. It should also result in revision of the management plan to reflect changes made.

If unacceptable variations in HCVs are detected, then the causes of this should be determined, taking into account:

- the effect of individual management actions;

- the potential of several cumulative impacts that may cause degradation of the HCVs;
- the extent to which natural disturbance events may be responsible for the degradation of the HCVs;
- the extent to which events occurring outside the forest management unit may cause degradation of HCVs.

5.2. Additional guidance for specific high conservation values

The points listed under each HCV type provide some additional guidance on possible indicators and methodologies.

5.2.1. HCVs 1 & 3: Requirements for 'concentration of biodiversity' and 'rare, threatened or endangered ecosystems'

1. Indicators of habitat quality will generally be a cheaper and more efficient way of detecting any likely change in species and ecosystems than directly monitoring species populations (see Box 5.1). Examples of such 'coarse-filter' monitoring indicators include:
    - stand structure (e.g., basal area, canopy cover, volume of dead wood),
    - extent of habitat types.
2. More direct indicators of the effect of management on species population trends may be required if the 'coarse-filter' monitoring indicates that there may be a problem or if they are of particular concern. Examples of such 'fine-filter' indicators include:
    - groups of species that are known to respond to management impacts
    - populations of individual species
    - other quantitative data such as hunting records from forest guards.
3. Other possible components of a monitoring programme could include:
    - If the forest management unit lies within a protected area, changes to the management regulations should be monitored.
    - Lists of rare, threatened or endangered species (e.g. CITES, IUCN red data lists, legally defined rare, threatened or endangered species etc) could be monitored at least every five years to determine whether the status of any species that occur or potentially occur within the habitat has changed.

- 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.

Box 5.1 Monitoring biological HCVFs in Central America[29]

A rigorous yet practical framework for monitoring biological HCVFs in natural forest in Central America has been developed and tested recently. Although focused on HCV 1, this framework has many aspects that would also be useful for monitoring forests containing HCVs 2 and 3. It should also prove applicable to natural forests in other regions of the tropics, with perhaps some minor modification.

The manual sets out ten essential steps in monitoring biological HCVs and provides guidance on how to implement them. The steps can be summarised as:

1. *Defining management objectives* –detailed, specific objectives are necessary for successful management and monitoring HCVF.
2. *Identifying HCVs* – as outlined in this Toolkit.
3. *Identifying threats to the HCVs* – once identified, it is important to assess the threats to HCVs and evaluate how serious they are.
4. *Defining actions to counter these threats* – specific actions should be based on the threats assessment conducted in the preceding step.
5. *Defining the monitoring objectives* – specific monitoring objectives need to be developed and these should take into account the costs of monitoring.
6. *Selecting indicators* – the manual suggests that 'course filter' indicators (e.g., stand structure) will be, in most cases, the most effective way of assessing whether management is causing inappropriate levels of disturbance to the ecosystem. Only when the course filter indicators suggest that there might be a problem, or when there is some other reason to be concerned, should 'fine filter' indicators be used (e.g., species groups known to be susceptible to disturbance).
7. *Establishing sampling design* – guidance is given on how to establish a sampling design that is both cost-effective and results in data that can be used to inform

[29] For further details see Hayes, J., Finegan, B., Delgado, D. & Gretzinger, S. (2003). '*Biological monitoring for forest management in High Conservation Value Forests*'. Much of this could readily be adapted for use in forests in other parts of the world. The manual is available from Bryan Finegan (bfinegan@catie.ac.cr).

management decisions.

8. *Setting 'triggers'* – the manual suggests how to define the levels of change that are required in the status of the indicators that indicate that management may not be working, should be reviewed and if necessary revised.
9. *Implementing the monitoring programme*
10. *Adapting management on the basis of monitoring results* – monitoring is only useful if it is linked into management decisions.

5.2.2. HCV2: Requirements for 'large, landscape level forest'

1. Indicators of habitat quality will generally be a cheaper and more efficient way of detecting any adverse change to the landscape than directly monitoring species populations. Examples of such 'coarse-filter' monitoring indicators include:
    - seral stage distribution
    - landscape connectivity
    - road density
    - representative habitat and wildlife population trends.
2. More direct indicators of the effect of management may be required if the 'coarse-filter' monitoring indicates that there may be a problem or if the species are of particular concern. Examples of such 'fine-filter' indicators include:
    - populations of species with large range requirements
    - populations of individual highly threatened species
3. Other possible components of a monitoring programme could be based upon the outstanding features or processes that are necessary for effective ecosystem functioning and the key aspects of FMU-level forest composition and habitat types.
4. Monitor the status of important landscape elements outside the FMU and report the actions taken to maintain or enhance HCV attributes outside the FMU where appropriate (including the creation of protected areas).

5.2.3. HCV4: Requirements for 'basic services in critical situations'

1. Basic monitoring indicators will often concern checking that management prescriptions (such as 'no harvesting zones') are being followed. Additional course-filter monitoring options may include:

- the area of the HCVF;
- the condition of the HCVF (e.g., basal area, canopy openness, presence of erosion gullies).

2. More direct, 'fine-filter' monitoring indicators might include:
    - water flow and sediment load;
    - fuel load (for HCV4.3).
3. Monitor how management is affecting each identified HCV, for example by checking incidence of landslides, water flow data or harvest audit results.
4. Monitor whether each of the identified HCVs remains critical, by consultation with key stakeholders (e.g. does a community which previously relied exclusively on a water source originating in your FMU now prefer to utilise alternatives)
5. Monitor how events outside the FMU increase the risk to each basic service HCV.

5.2.4. HCV5 & 6: Requirements for social and cultural HCVs

Participatory monitoring and assessment is very important in many situations. Communities should be given the informed opportunity ('informed' means they are given the information about what monitoring and assessment is for and how it is done in a form which is understandable) to be involved in:

1. Planning monitoring.
2. Choosing the person/people to undertake monitoring.
3. Carrying out monitoring.
4. Deciding how and when stakeholders are provided with the results of monitoring.
5. Deciding what to do as a result of monitoring.
6. When these HCVFs are identified, the baseline and indicators should be established in a way that is credible to both the affected communities and the company. Indicators could include continued access to, quality and functionality of special sites, water quality, yields of subsistence foods, or compliance of forest operations with conditions agreed with the community.