Forest Stewardship Council®

The FSC National Forest Stewardship Standard of Japan- Addendum

National High Conservation Values (HCV) Framework of Japan

FSC-STD-JPN-01.1-2020a Japan Natural Forests and Plantations EN

Note: This document is an addendum of the FSC National Forest Stewardship Standard of Japan (FSC-STD-JPN-01.1-2020 Japan Natural Forests and Plantations EN) and it is a normative document. This framework shall be used alongside with the FSC National Forest Stewardship Standard of Japan (FSC-STD-JPN-01.1-2020 Japan Natural Forests and Plantations EN) to help implement requirements relevant to HCV.

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Photo Credit.

From Left to Right:

Photo 1: Riparian forest in Yamanashi (Credit by Hitoshi Fujishima for FSC Japan)

Photo 2: A shrine in Yusuhara, Kochi (Credit by Chisato Mishiba, FSC Japan)

Photo 3: A pile of FSC certified logs in Tenryu (Credit by Hitoshi Fujishima for FSC Japan)

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The Forest Stewardship Council® (FSC) is an independent, not for profit, non-government organization established to support environmentally appropriate, socially beneficial, and economically viable management of the world's forests.

FSC's vision: the true value of forests is recognized and fully incorporated into society worldwide. FSC is the leading catalyst and defining force for improved forest management and market transformation, shifting the global forest trend toward sustainable use, conservation, restoration, and respect for all.

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Foreword

Two decades have passed since the Forest Stewardship Council® (FSC®) first introduced the concept of High Conservation Value Forest (HCVF) in 1999. During this period, the notion of HCVF has evolved into more holistic High Conservation Value (HCV), and it has been incorporated into the framework of many certification schemes for sustainability and used in the field of conservation. A number of related documents have been published online for the use in the field, and national HCV framework and toolkit documents have been developed in many countries to put the concept into practice in the field.

On the other hand in Japan, while there have been many relevant resources such as database of biodiversity and cultural heritage, no document has been developed to provide a guideline or foundation for the common understanding of how to identify or manage HCV. Relevant resources published in English remain practically unavailable to Japanese stakeholders due to the language barrier. Due to the lack of HCV framework in Japan, stakeholders have applied the international definition of HCV with their own interpretation to identify, manage and monitor HCV to meet certification requirements. However, because the international definition is rather general and lacks specificity, in reality, the actual practice on the field depended on interpretation of individual certificate holders, certification bodies, and auditors. While the international trend is to standardize capability or qualification of HCV assessors and even HCV assessment report format, Japan seems to be left behind the tide.

In 2015, FSC published the International Generic Indicators (IGI) based on the FSC principles and criteria version 5 (FSC-STD-01-001 V5-2). Based on the IGI, the national forest stewardship standard of Japan was developed in 2018. This document was originally developed as a guidance to standardize the interpretation of HCV in Japan and to eliminate the gaps in understanding of HCV among stakeholders, but later adopted as an HCV framework document which supplements the national standard. It provides practical information for forest managers and relevant stakeholders in Japan to apply in the field, including how to collect information and identify HCV, how to determine management measures, and methods for monitoring. In addition, various information from the published English resources is included to inform Japanese stakeholders of the international knowledge and techniques on HCV conservation and management that would be also useful in Japan.

In developing this document, we sought advices from environmental NGOs, researchers and experts, collected opinions from stakeholders such as certification bodies and FSC forest management (FM) certificate holders through multiple public consultations. We hope this document will be a good help to responsible forest management and HCV protection in Japan.

i. Definition of HCV

In the FSC Principles and Criteria FSC-STD-01-001 v5-2 published in 2015, HCV is defined as follows:

Category	Definition
HCV 1	**Species diversity.** Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.
HCV 2	**Landscape-level ecosystems and mosaics.** Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
HCV 3	**Ecosystems and habitats.** Rare, threatened, or endangered ecosystems, habitats or refugia.
HCV 4	**Critical ecosystem services.** Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
HCV 5	**Community needs.** Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.
HCV 6	**Cultural values.** Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement with these local communities or Indigenous Peoples.

ii. Evolution of the HCV Concept

The concept of High Conservation Value Forest (HCVF) was first introduced in 1999 as Principle 9 of the forest management standard of the Forest Stewardship Council (FSC). The concept was developed as a tool to identify socially, culturally and environmentally significant sites, and to maintain their ecological and social values to ensure the sustainable use of forest resources. Later, the term “HCVF” has evolved to “HCV”, reflecting the idea that what should be protected is not necessarily limited to the forest, but the value it embodies.

Since its first introduction in 1999, the concept of HCVF/HCV has evolved and has been adopted by many certification schemes, such as The Climate, Community and Biodiversity (CCB) Standards, which is a standard for climate change mitigation measures, Roundtable for Sustainable Palm Oil (RSPO), Round Table on Responsible Soy (RTRS), and Bonsucro (sugarcane certification). However, the place to be considered as HCV, how to assess and manage HCV varies widely with country, as it is closely tied to the ecology, culture, history etc. that are specific to each country. Thus development of national or regional definition and guidelines is very important for identification and management of HCVs. After ProForest published the HCVF toolkit in 2003, national framework and guideline documents have been developed in many countries. In 2005, the global network of HCV, HCV Resources Network, was organized to put together such national initiatives, and today, such documents – not only the international guidance and toolkits, but also those developed in various countries – are freely available from the website of the HCV Resource Network[1].

In recent years, HCV Assessor License Scheme has been established by the HCV Resource Network to standardize the methods of the assessments, report format, quality of assessors etc. to ensure consistency in HCV assessment quality. The scheme is getting popular in areas where HCV is particularly threatened, but there is no such sign in Japan. In Japan, instead, the situation is that most stakeholders continue the same old practice without having access to relevant HCV resources available in English.

iii. HCV in FSC certification

Protecting HCVs is one of the most important requirements of forest stewardship that FSC upholds. Not only that HCV comprises one of the ten principles of forest stewardship, but destruction of HCV is also listed as one of the six “unacceptable activities[2]” that FSC prohibits. The FSC scheme completely excludes

[1] https://www.hcvnetwork.org/resources/global-hcv-toolkits

[2] 1) Illegal logging or the trade in illegal wood or forest products, 2) Violation of traditional and human rights in forestry operations; 3) Destruction of high conservation values in forestry operations; 4) Significant conversion of forests to plantations or non-forest use; 5) Introduction of genetically modified organisms in forestry operations; 6) Violation of any of the ILO Core Conventions.

the wood from forest where HCV is threatened by forest management from its system.

FSC certification system allows mixing of certified wood with reclaimed materials and Controlled Wood to produce FSC Mix products. Controlled Wood refers to woody material that that have been demonstrated to have low risk of coming from the unacceptable sources. For this reason, the five categories of unacceptable sources are called “controlled wood categories”, of which the third concerns HCV destruction. As such, while this document discusses identification, management, and monitoring of HCV and does not directly handles risk assessment for Controlled Wood, information on HCV identification is also applicable to the risk assessment.

Furthermore, in the “Policy for the Association of Organizations with FSC” (FSC-POL-01-004 V2-0), FSC stipulates the policy to prohibit its association with organization that are involved in unacceptable activities, including destruction of HCV. Before a certificate is granted, organizations are required to sign a declaration to pledge that the organization is not involved in the unacceptable activities. This demonstrates that destruction of HCV is a taboo in FSC.

In the forest management (FM) certification, there are a number of requirements related to HCV in addition to Principle 9, which is devoted to HCV. In the process of certification, forest management organizations with HCVs are required to have pre-assessment before the main assessment to get certified, and some requirements about HCV are required to be checked in every annual audit. Altogether, the system of FSC FM certification provides double or triple assurance for conservation of HCVs.

iv. Forest and Forestry in Japan

Japan is a home to many endemic species owing to unique geographical feature as an archipelago and climatic diversity, and is designated as one of the global biodiversity hotspots. Because Japan has a deep historical, cultural tie with wood, it is considered that there are many ecological and social HCVs in Japan. In fact, many forests with recognized ecological, or cultural values have been already protected under various administrative frameworks with restrictions. Law enforcement are generally considered effective in Japan, and the legally designated conservation zones are generally well protected.

Japan is one of the most forested countries in the world, with 66% of the national land covered by the forest. Approximately 40% of them is plantation of conifers, where forestry is practiced for timber production. Most of the plantations were established after the World War II, especially during the period of high economic growth in the 1960s and 1970s. At that time, many household switched the energy source from conventional wood-based fuel to fossil fuels, and the woodlands used for fuel extraction were converted into plantations of conifer trees, such as Sugi (*Cryptomeria japonica*), Hinoki (*Chamaecyparis*

obtusa), larch (*Larix kaempferi*), and pines. Some woodlands were abandoned, left unmanaged and developed into secondary hardwood forests from coppicing. Commercial forestry in Japan mainly occurs in plantations, and management of hardwood forest for commercial purpose is limited.

In terms of ownership, 31% of the Japanese forests are state owned, 12% publicly owned by municipalities, and 58% privately owned. Natural forests with high ecological values mostly occur in the land owned by the state or municipalities, while plantations secondary forests are common in private forest. The ownerships of Japanese forests are typically small and scattered; the average forest area owned by private forest owners that own more than 1 hectare was 6.2 ha, and 74% of the forest owners own less than 5 ha of forest[3]. Such small private forest owners commonly engage with the local forestry cooperative to manage their forests.

While vast area of plantations that were established after the World War II are getting mature and ready to be harvested, the forestry industry has been sluggish for decades, and many plantations are left without sufficient management. While the price of Sugi and Hinoki wood has dropped to almost one third of its peak price in 1980, the wage for workers have increased significantly. According to the statistics, while in 1961, the sale of 1 m3 of Sugi covered the wage of 11.8 people, in 2004 it only paid for 0.4 people. At present, most of the forestry operations cannot sustain themselves without government subsidy. This inevitably led the forestry operations to focus on reducing the cost, which resulted in focus on repeated thinning and avoidance of clearcutting (final-cutting), which requires cost for reforestation. More recently however, there are some areas where clearcutting is increasing in response to the rising demand for biomass. Yet in many cases the clearcutting is not followed by regeneration (replanting), and as such, the sustainability of forestry remains threatened.

The current issues of Japanese forestry which may pose a threat to HCV include the reduced labor force of forestry due to the low profitability of the industry and the abandonment of plantation, which together leads to deterioration of environmental values. When plantations are left unmanaged without proper thinning, the canopy becomes too crowded to allow the penetration of sunlight to the forest floor. Then the understory vegetation dwindles, the soil is exposed and becomes susceptible to erosion. The ecosystem service of forests to prevent and mitigate disaster is considered very important in Japan, as natural disaster is ubiquitous throughout Japan, and the country is hit by powerful typhoons every year. The recession of forestry can be a threat to such ecosystem function of the forests.

Furthermore, overpopulation of herbivores, especially deer, has been causing a major damage in agriculture and forestry. Until recently, deer has long been protected for a long time, and its hunting was strictly controlled. However, the number has increased dramatically in recent years, and damage from it is not only limited to the agriculture and forestry, but also the ecosystem and natural vegetation is heavily impacted. Today, the sharp reduction or loss of vegetation and the inhibition of forest regeneration, etc.

[3] World Census of Agriculture and forestry. 2015. Ministry of Agriculture, Forestry and Fishery.

due to deer feeding have been reported in many parts of Japan, especially in western Japan. As a measure, the national and local governments are actively encouraging hunting of herbivores, such as deer and wild boars.

In general, while the forest resources used to be central to the lives of peoples in the past, it is no longer considered indispensable to people's lives even in rural areas, as the people's lifestyle has changed. It can be said that the economic, cultural values and importance of forest that was embraced by local communities is diminishing nationwide. It can be said that such a change in value may be also another risk to HCV.

v. How to Use This Document

This document was developed mainly based on the following two guidance documents published by the HCV Resource Network with some addition of original contents based on other literature, or consultation with experts, NGO, and FSC certification stakeholders in Japan.

- Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.) 2013 (October). Common guidance for the identification of High Conservation Values, HCV Resource Network.
- Brown, E. and M.J.M. Senior. 2014 (September). Common Guidance for the Management and Monitoring of High Conservation Values. HCV Resource Network.

While the above two documents handle diverse ecosystem around the world, with the large-scale agricultural or forestry organizations as main targets, this document focuses on HCV in Japanese forest, with stakeholders of FSC certification as the main target, especially certificate holders and forest management (FM) auditors of certification bodies as the target. This is the national HCV framework, a normative document that supplements the FSC National Forest Stewardship Standard of Japan, providing instructions how to conduct identification, management, and monitoring of HCV in Japan in order to meet the requirements of FSC FM certification. It does not intend to directly identify HCVs in Japan.

This document largely consists of four chapters; Chapter 1 on identification of HCV; Chapter 2 on HCV management; Chapter 3 on monitoring; and Chapter 4 on adaptive management, followed by case studies in an annex. The structure of this document, and contents of each chapter, as well as corresponding criteria in FSC FM standard is depicted in Figure 1.

It is mandatory for FSC FM certificate holders in Japan to use this normative document in relation to HCV. In particular, Criterion 9.1 of the FSC FM Standard requires an HCV assessment that is consistent with this HCV framework. This "consistency" means making the most use of the document by referring to relevant information, but it should not be interpreted in a narrow way that organizations need to follow every detail of the document.

For example, Section 1.1 of this document provides examples of Best Available Information referred in the standard, as well as interpretation of each information source. The certificate holders, however, are not necessarily required to use all of the information sources or follow every suggestion outlined in the document. Rather, information and advices appropriate to the environmental, social and economic conditions of a particular management unit need to be used.

The information provided in this document is by no means comprehensive; assessors may find some information rather irrelevant for their particular case. They may also seek information from their original sources as necessary. Moreover, usability of information changes widely depending on the context. It is necessary for assessors to assess reliability and usability of the available information and decide how to use the information to make the best decision for their case. In other words, while certificate holders are expected to make use of this document for HCV protection, how exactly to use it is left to their discretion.

Chapter 2 and 3 provide possible management strategies and monitoring methods, together with practical advices to help HCV managers devise appropriate management strategies and monitoring methods. Yet again, options of HCV management are not limited to those described in this document; HCV managers are free to take any other measures (in addition to those outlined in this framework) that they deem more suitable for their case.

This document provides information that would be useful for Japanese forest management organizations in general, especially for those in small scale with limited resources. On the other hand, technically or economically challenging methods typically employed by professionals are not necessarily covered. This does not mean that such technical methods should be avoided. Rather, organizations are encouraged to explore various methods beyond those described in this document if their resources allow it.

It is our hope that this document is used not only in the fields of FSC certification but also environmental certification business and environmental education as a common base of understanding in practicing HCV conservation in forest management in Japan.

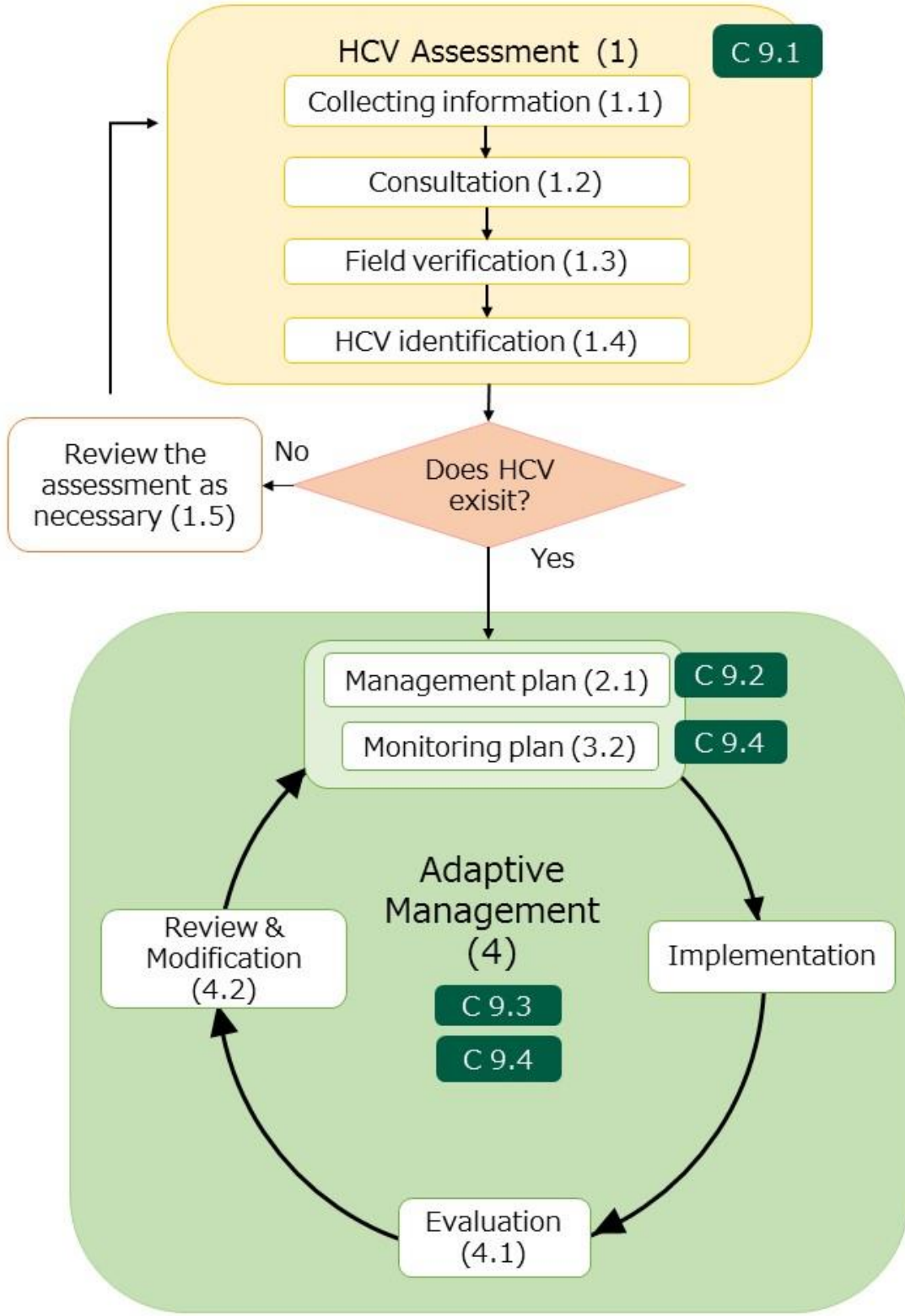

Figure 1 Workflow of HCV protection. The number in parentheses shows the section number, while the deep green rounded rectangles in the right show corresponding criterion in FSC FM standard.

1. HCV Assessment

An HCV assessment is the process by which HCVs are evaluated and identified in practice appropriate to the scale, intensity, and risk of the organization, forest management and threats. Assessors must have relevant knowledge and experience, and it can be conducted in teams internally organized by the organization, though it can be also delegated to a third party, especially when detailed HCV assessment is required considering the scale, intensity and risk, but is technically challenging to be conducted by an internal team. See Table 1for for the evaluation of the scale, intensity and risk.

Table 1 Expected levels of HCV assessment according to scale, intensity, and risk: More intensive HCV assessment would be appropriate when the scale of activities is large, the intensity of activities is high, or there is an HCV that is especially vulnerable.

	Simple HCV assessment	**More intensive HCV assessment**
Scale of activities	Smaller scale • Small-scale operations by smallholders • Limited use of pesticides and fertilizers	Larger scale • Large-scale conversion of natural vegetation • Frequent use of pesticides in large amount
Intensity	Lower Intensity • Use of native species • Cable logging • Little practice of hunting and fishing • Large part of the management unit is designated as conservation areas.	Higher Intensity • Use of exotic species • Ground-based skidding by heavy machinery • Active practice of hunting and fishing • Substantial water use affecting downstream hydrologic flows • Construction of structures for flood or erosion control affecting hydrology (e.g. dam construction)
Risk (Based on scale and intensity of activities and the vulnerability level of HCVs)	Lower Risk • Based on the literature, prior assessments, expert opinion, and stakeholder input, that HCVs are present in the production site or in its larger area of influence • An organization chooses to presume that presence of HCVs, based on a possibility of their	Higher Risk • Based on the literature, prior assessments, expert opinion, and stakeholder input, there is some likelihood that HCVs may be present in the production site or in its larger area of influence • Some of the HCVs are especially vulnerable

	presence, as identified by stakeholders, specialists or available literature	- Some of the hunted animals are known to be key pollinators or seed-dispersers - Some of the RTE species are highly dependent on undisturbed habitats - Natural habitats in this region are already highly fragmented - Soils are prone to erosion

An HCV assessment should primarily cover the management unit that the organization has control over, but it is important to consider the wider landscape context in order to assess the real values of and risks to HCVs. Thus, the assessment report should describe following key social and ecological features of the wider landscape as background:

- Geographical scope of the assessment
- Distribution of protected areas
- Ecological features (e.g. biogeography, major ecosystem, fauna and flora, current vegetation, potential natural vegetation
- Occurrence of rare, threatened, and endangered species
- Physical features (Major landforms, climate, watersheds and rivers, geology and soil)
- Land use (human settlements and infrastructure, agricultural areas etc.)
- History of land use and development trends, and future plans (including relevant land use planning by government)
- Social context (demographics, industry, culture, indigenous peoples)

HCV identification is best carried out through a stepwise, screening approach. First, start with gathering information on HCV that may be present in the management unit. Then conduct consultation with stakeholders and experts. Such consultations are especially important for HCV 5 and 6. At the time of the consultations, it is good to discuss the potential management and monitoring methods.

The following provides description of features that would be considered HCVs:

HCV1

- A high overall species richness, diversity or uniqueness when compared with other sites within the same biogeographic area.
- Existence of populations of multiple endemic or RTE species.
- Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations either year-round (e.g. key habitat for a specific species) or seasonally, including migratory corridors, sites for breeding, roosting or hibernation, or refuges from disturbance.
- Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question (such species are likely to be restricted to a few remaining areas of habitat, and to be classified as EN or CR on the IUCN Red List). In these cases, it is considered that every surviving individual is globally significant
- Sites with significant RTE species richness, or populations (including temporary concentrations) of priority species approaching those of key protected areas or other priority sites (e.g. KBAs) within the same biogeographic boundary.
- Particularly important genetic variants, subspecies or varieties.

HCV 2:

- Large areas that are relatively far from human settlement, roads or other access.
- Smaller areas that provide key landscape functions, such as connectivity and buffering, that contribute to maintaining larger areas in the wider landscape.
- Large areas that are relatively natural and intact and which provide habitats of top predators or species with large range requirements.

HCV3:

Ecosystems that are:

- Naturally rare because they depend on highly localised soil types, locations, hydrology, or other climatic or physical features, such as limestone karst forests, islands between different ecoregions.
- Anthropogenically rare, because the extent of the ecosystem has been greatly reduced by human activities compared to their historic extent, such as fragments of primary forests in regions where almost all primary forests have been eliminated.
- Threatened or endangered (e.g. rapidly declining) due to current or proposed operations.
- Classified as threatened in national or international systems (such as the IUCN Red List of Ecosystems, though no Japanese ecosystem has been evaluated the Red List as of December 2019).

HCV4:

Ecosystem services, in critical situations, related to:

- Maintaining water resource (stabilizing flow, flood prevention and alleviation, maintaining water quality, protection of aquifer), e.g. riparian buffer zones.
- Provision of water (where local communities depend on natural rivers and springs for drinking water, or where natural ecosystems play an important role.
- Erosion control and protection of vulnerable soils (e.g. steep slope)
- Protection against winds, snow, the regulation of humidity, rainfall and other climatic elements.
- Fire prevention and protection

HCV5:

Places that are fundamental for satisfying basic needs such as:

- Hunting and fishing grounds for consumption by local communities and indigenous peoples
- Collection grounds for NTFPs such as nuts, berries, mushrooms, and medicinal plants
- Collection for fuel for self-sufficiency
- Provision of building materials (poles, thatching, timber) for self-sufficiency of the local communities and indigenous peoples
- Fodder for livestock and (seasonal) grazing
- Water sources necessary for drinking water and sanitation
- Items which are bartered in exchange for other essential goods, or sold for cash which is then used to buy essentials

HCV 6:

- Sites recognized as having high cultural value by national government and/or an international agency like UNESCO.
- Sites with recognized and important historical or cultural values, even if they remain unprotected by legislation.
- Religious or sacred sites, burial grounds or sites at which traditional ceremonies take place that have importance to local or indigenous people.
- Plant or animal resources with totemic values or used in traditional ceremonies.

1.1. Collecting Information

In Japan, many HCVs have been already protected by various frameworks and legal restrictions on use are placed by various laws. There are abundant resources that provide relevant information, with regards to HCV 1 to 4 in particular. However, some information is only available at the national or prefectural level, but not at the scale useful for HCV identification in the field, though such information is still useful as reference. Furthermore, there are various governmental designations; some are selected carefully with robust standard as having globally important value and are subject to strict restrictions, while others are fairly common and do not have as high conservation value as to be considered as HCV. This section explores such information and their status.

Generally speaking, HCV2 is considered to have been covered by the legal framework for conservation. HCV 2 is the landscape-level ecosystems and mosaics, such as intact forest landscapes, which is defined as “a territory … which contains … ecosystems minimally influenced by human economic activity, with an area of at least 500 km2 (50,000 ha) and a minimal width of 10 km”. In Japan, it is fair to assume that such a large tract of undisturbed landscape is only left within protected areas such as national parks. It is highly unlikely such a landscape occurs in private land managed for timber production. Generally speaking, it is also unlikely that HCV 1 and 3 occurs in plantation. Moreover, it can be said that as the Japanese people’s life was modernized, people became less dependent on forests, and HCV5 is no longer common.

Table 2 below lists designation of protected areas by international organizations and the government, together with its relevance to HCV identification classified from A to C. However, these ranks alone do not dictate presence of HCVs by itself; the information should be used as a tool to narrow down areas with HCVs. In the table 2, the rank A means high possibility of being HCV, for the designations have strict criteria overlapping the definition of HCV, and the areas have been selected through consultation with experts. Designated areas in rank B has criteria that are less stringent than those of rank A, or the evaluation process for the designation is not as strict as A. Thus areas in rank B would need further corroboration before it is considered as HCV. Designation in rank C is not very relevant to HCV identification because the designation criteria do not quite overlap with the definition of HCV. However, this does not deny the importance of such designation or its value for conservation. Furthermore, while Table 2 only lists national or international conservation framework, it is necessary to identify places protected by local laws applicable to the area.

As evident in Table 2, many of the areas are protected for their biodiversity and ecosystem services values, including disaster prevention. On the other hand, existing conservation framework for socio-economic values of HCV 5 and 6 is limited, thus stakeholder consultations are particularly important for their identification.

Table 2: Existing designation of protected areas, associated HCV categories, and relevance to HCV identification

This table does not necessarily cover all existing frameworks.

Designation		Basis laws and framework	HCV Category[4]	Relevance[5]	Note / references
World heritage site	World natural heritage	World Heritage Convention	1 -3	A	Restrictions for conservation are placed by national laws http://www.unesco.or.jp/isan/
	World cultural heritage		6 (1~3)	A	
World Agricultural Heritage		Not applicable	5, 6	B	http://www.maff.go.jp/j/nousin/kantai/giahs_1.html
Ramsar sites		Ramsar Convention	1, 3	A	Restrictions for conservation are placed by national laws http://www.env.go.jp/nature/ramsar/conv/index.html
UNESCO Man and Biosphere Reserve	Core zone	Not applicable (UNESCO Man and the Biosphere Programme)	1 -3	A	http://www.mext.go.jp/unesco/005/1341691.htm
	Buffer zone		1 -3	B	
	Transition zone		1 -3	C	
UNESCO Global Geopark		Not applicable	1-6	C	http://globalgeoparksnetwork.org/
Japan Geopark		Not applicable	1-6	C	http://www.geopark.jp/geopark/
National parks and Quasi-National Park	Special protection area	Natural Parks Act	1 -3	A	National parks https://www.env.go.jp/park/parks/index.html Quasi-national parks https://www.bes.or.jp/invitation/list_qp.html
	Special area outside the special protection area		1 -3	B	
	Common area		1 -3	B	
Prefectural natural park			1 -3	B	See corresponding prefecture's website

[4] HCV categories that are considered likely, but it does not exclude the possibility of existence of other categories of HCV.

[5] Likelihood of being HCV; A: Highly likely to be HCV; B: Likely to have HCV, but further corroboration is needed for identification; C: Designation criteria are not relevant for HCV identification.

Designation		Basis laws and framework	HCV Category[4]	Relevance[5]	Note / references
Nature conservation area	Primeval nature conservation area	Nature Conservation Act	2	A	https://www.env.go.jp/nature/hozen/index.html
	Nature conservation area		1 or 3	B	
	Prefectural nature conservation area		1 or 3	B	
Natural Habitat Protection Areas		Act on Conservation of Endangered Species of Wild Fauna and Flora	1	A	https://www.env.go.jp/nature/kisho/hogoku/list.html
Wildlife refuge	Special wildlife refuge	Protection and Control of Wild Birds and Mammals and Hunting Management Law	1-3	A	https://www.env.go.jp/nature/choju/area/area1.html GIS data: http://nlftp.mlit.go.jp/ksj/gml/datalist/KsjTmplt-A15.html
	Wildlife refuge		1-3	B	
Protection Forest	Water resources conservation protection forest	Forest Act	4	B	http://www.rinya.maff.go.jp/j/tisan/tisan/con_2.html Designations in rank B are often designated in large areas and are fairly common, so it is not necessary to consider the entire area as HCV.
	Soil erosion prevention protection forest		4	B	
	Landslide prevention protection forest		4	A	
	Sand blow break protection forest		4	A	
	Windbreak protection forest		4	A	
	Flood control protection forest		4	A	
	Salt damage prevention forest		4	A	
	Drought prevention forest		4	B	

Designation		Basis laws and framework	HCV Category[4]	Relevance[5]	Note / references
	Snow protection forest		4	A	
	Fog protection forest		4	A	
	Avalanche prevention forest		4	A	
	Rockfall protection forest		4	A	
	Fire prevention protection forest		4	A	
	Fish protection forest		1, 3, 4	B	
	Airplane target protection forest		Not applicable	C	
	Health protection forest		6	B	
	Scenic protection forest		6	B	
National forest reserve	Forest ecosystem reserve	National forest reserve program	2	A	http://www.rinya.maff.go.jp/j/kokuyu_rinya/sizen_kankyo/hogorin.html
	Biological communities reserve		1	A	
	Rare population conservation reserve		1	A	
Important wetland area		Basic Environment Plan National Biodiversity Strategy	1, 3, 4	A	http://www.env.go.jp/nature/important_wetland/index.html
Sediment disaster prone area	Sediment disaster special prone areas	Act on Sediment Disaster Countermeasures for	4	A	Consider HCV forest above the designated area. Since there is no delineation of such area, the

Designation		Basis laws and framework	HCV Category[4]	Relevance[5]	Note / references
	Sediment disaster prone areas	Sediment Disaster Prone Areas	4	B	boundary needs to be determined upon more investigation. See the Hazard Map Portal Site of the Ministry of Land, Infrastructure, Transport and Tourism: https://disaportal.gsi.go.jp/ Information is available at local governments' websites. Forests located above the designated area can be considered as HCV. However, there is no area designation for the forests, so it is necessary to determine the boundaries independently.
Caution sites for Landslide disaster	Mudslides caution stream		4	B	See the Hazard Map Portal Site of the Ministry of Land, Infrastructure, Transport and Tourism: https://disaportal.gsi.go.jp/ Relevant information is available at local governments' websites. Landslide occurs regardless of the condition of forest. Thus forests above Landslide prone site do not have to be considered as HCV.
	Landslide caution site		Not applicable	C	
	Collapse of steep terrain caution site		4	B	
Erosion control designation sites		Erosion Control Act	4	B	Information available at the website of prefectural governments.
Steep slope failure prone zone		Act on Prevention of Disasters Caused by Steep Slope Failure	4	B	Information available at the website of prefectural governments.
Landslide prevention zone		Landslide Prevention Act	Not applicable	C	Landslide occurs regardless of the condition of forest. Forests associated to this designation does not have to be considered as HCV.
Mountainous disaster hazard area	Debris flow hazard area	Forestry Agency Mountain disaster risk area survey guidelines	4	B	Information available at the website of prefectural governments.
	Landslide hazard area		Not applicable	C	Landslide occurs regardless of the condition of forest. Thus it does not have to be considered as HCV.

Designation		Basis laws and framework	HCV Category[4]	Relevance[5]	Note / references
	Hillside failure hazard area		4	B	Information available at the website of prefectural governments.
Nature reserve	Special natural monument	Act on Protection of Cultural Properties	1 -3	A	Searchable through Cultural Heritage Database[6] and National Cultural Property Database[7] of the Agency for Cultural Affairs.
	Natural monument		1 -3	B	
Scenic spots	Special scenic spots		6	A	
	Scenic spots		6	B	
Cultural landscape	Important cultural landscape		6	A	
Historic site	Special historic site		6	A	
	Historic site		6	B	

[6] http://bunka.nii.ac.jp/db/

[7] http://kunishitei.bunka.go.jp/bsys/index_pc.asp

The following section provides sources of information, both public and private, that would be useful for identifying HCV. However, information listed here is by no means exhaustive; it is encouraged to seek various information proactively, ranging from literature such as books, academic papers, local historical records, historical and natural museums to modern technology such as remote sensing, satellite and aerial photographs, GIS information.

Sources on Biodiversity, Landscape, and Ecosystem (HCV 1, 2, and 3)

- Biodiversity Center of Japan, Nature Conservation Bureau, Ministry of the Environment
  http://www.biodic.go.jp/

  Database on biodiversity managed by the Ministry of the Environment. This site publishes the results of basic natural environment surveys such as vegetation surveys and wildlife surveys. Various information on biodiversity are available on GIS maps. The vegetation communities shown in the vegetation map are classified into ten levels of naturalness, of which 6 to 9 represent forests. Forest plantations have a vegetation naturalness of 6, and the forests reaching the climax have the vegetation naturalness 9. Vegetation naturalness of 10 is natural grasslands. Due to their rarity and non-substitutability as an ecosystem, areas with a vegetation naturalness of 9 and 10 can be considered as HCV (category 1 or 3).

- Biological Diversity Assessment Map
  https://www.biodic.go.jp/biodiversity/activity/policy/map/index.html
  Ministry of the Environment publishes various nationwide maps, such as maps showing the situation of biodiversity, areas where biodiversity is threatened, and areas that need conservation measures etc. in order to plan and take measures for conservation of biodiversity.
  https://www.biodic.go.jp/biodiversity/activity/policy/map/list.html
  Among the maps listed, those that are especially relevant includes the maps of “Area with natural ecosystem that characterizes the national land”, “Small areas with ecosystem vulnerable to development etc.”, and the gaps between the areas identified above and existing protected areas would be especially useful for the identification of HCV 1 and 3.

  Maps are provided in both PDF and GIS data. While PDF maps are only available at the national scale with limited usability in the field for HCV identification, GIS data provide information at finer scale. Biodiversity profile data prepared for each municipality would be also useful.

The Red Lists

The list of threatened species known as the Red List was first developed by the International Union for Conservation of Nature (IUCN) in 1966, and then spread globally. Today, various databases of Red Lists are provided by governmental agencies, academic societies and NGOs.

While the red data books of Ministry of the Environment, the Fisheries Agency, and academic societies provide information at the national level, the prefectural governments' red data books are not necessarily standardized as they depend on the efforts of each local government. Most of the assessment uses the same assessment criteria as IUCN, but due to the varying geographical extent the red data books cover, the same species often have different rating at global level (IUCN), at national level (administrative agencies and academic societies), and at regional level (prefectural government).

For identification of HCV1, the species in the category of VU, EN or CR in IUCN Red List, or category II (VU) or above in Red List prepared by the Ministry of the Environment should be considered.

- The IUCN Red List of Threatened Species (mainly English)
  http://www.iucnredlist.org/
  This online database provides information of species around the world. For species that have sufficient data for evaluation, the risk to extinction of species are evaluated into the categories: least concern (LC), near threatened (NT), vulnerable (VU), endangered (EN), critically endangered (CR), extinct in the wild (EW), and extinct (EX).

- IUCN Red List of Ecosystems
  https://iucnrle.org/
  IUCN assesses conservation status of various ecosystems around, and the information is available through this website. As of December 2019, no Japanese ecosystem has been assessed yet.

- Search System of Japanese Red Data
  http://jpnrdb.com/
  This database integrates the information from various red data books and red lists in Japan. It provides links to the websites on red data book provided by prefectural governments.

- Intact Forest Landscape
  http://www.intactforests.org/

Led by the international environmental NGO Greenpeace with cooperation from international organizations and research institutions, the area that maintains intact forest landscape are identified globally as a control for comparison to monitor forest degradation.

Intact forest landscape is defined as "a seamless mosaic of forest and naturally treeless ecosystems within the zone of current forest extent, which exhibit no remotely detected signs of human activity or habitat fragmentation and is large enough to maintain all native biological diversity, including viable populations of wide-ranging species." The intact forest landscapes are considered to be HCV2. The location can be also viewed in Global Forest Watch (https://www.globalforestwatch.org/).

In Japan, two areas are identified as intact forest landscapes in 2016: Hidaka Mountains and the area around the three Dewa Mountains and Mt. Asahi-dake. These maps are downloadable as GIS data from the website.

- WWF Global 200

  https://www.wwf.or.jp/activities/lib/g200.html

  Terrestrial and aquatic ecoregion (relatively large area that share relatively uniform climate characteristics and species and biological community characteristics) that are identified as globally important in terms of biodiversity selected by the World Wildlife Fund for Nature (WWF), an international environmental NGO. As a Japanese forested area, the subtropical forests in Nansei Islands are included in the list. The area is known to host many endemic species, and is likely to be HCV 1 or 3.

- Key Biodiversity Area (KBA)

  http://kba.conservation.or.jp/

  Areas of significance for biodiversity conservation in Japan, identified by the international environmental NGO Conservation International by assessing vulnerability and non-substitutability using the existing data.

  Based on the selection criteria, KBA is likely to be HCV 1 or 3. However, due to the resolution of original data and the scale, some KBAs cover fairly large area, such as the whole area of a peninsular or a plain. Thus further verification is needed for identification of HCV in the field.

There are also other initiatives to identify local biodiversity hotspots. For such information, contact the relevant department of the local authority and locally active NGOs. For example, NPO Nature Conservation Society of Kanagawa Prefecture identified hotpots within Kanagawa Prefecture important for biodiversity conservation by collecting opinions of experts of various organisms and evaluating the natural environment throughout the Prefecture.

http://www.eco-kana.org/report/2015hotspot-2.html

Information Sources on Ecosystem Services (HCV 4)

- One Hundred Selected Waters of Japan
  https://www2.env.go.jp/water-pub/Mizu-site/meisui/
  One hundred water springs, water courses (including irrigation canals) and groundwater were originally selected by the Environmental Agency (current Ministry of the Environment) in 1985 for their well-preserved condition supported by the local people etc. In 2008, new “One Hundred Best Waters in Heisei” was selected. Since there was no overlap with the previously selected sites, in total 200 sites have been selected. The main forest areas supporting such water can be HCV4.

- One Hundred Selected Water Source Forests of Japan
  http://www.rinya.maff.go.jp/j/suigen/hyakusen/zenkoku-chizu.html
  Selected by the Forestry Agency in 1995, the One hundred water source forests have been conserved and maintained for water use for long time. While the selected forests have a potential to be HCV4, there is no need to consider the whole area as HCV, as many of the sites cover quite a large area.

  Both of the selections above can correspond to HCV 5 or 6 if the water is indispensable for the lives of local communities, or when they have cultural, spiritual, or religious significance.

Information Sources on Historical and Cultural Values (HCV 6)

- Forest of Homeland Cultural Property
  http://www.bunka.go.jp/seisaku/bunkazai/joseishien/furusato_mori/
  Supply areas designated by the Agency for Cultural Affairs for traditional building materials such as timber, hinoki bark, straw for thatching, and lacquer that are necessary to preserve historical architecture including national treasures and important cultural properties and pass them down to the future generations.

- The Comprehensive Study on Scenic Spots
  http://www.bunka.go.jp/tokei_hakusho_shuppan/tokeichosa/pdf/meishou_chousa.pdf
  A report of the project “Comprehensive Study on Places of Scenic Beauty”, which was carried out by the Agency for Cultural Affairs from 2011 for two years. It summarizes the result of the nationwide survey of scenic spots, and includes information of those without formal designation. It also includes undesignated sites related to the Ainu peoples.

In Hokkaido in particular, it is necessary to make special consideration for cultural heritage of the indigenous Ainu Peoples. The cultural heritage of Ainu Peoples includes the nationally designated Special Places of Scenic Beauty "*Pirikanoka*". Following sources can be used as references, although identification and management of HCV 6 should focus on consultation with affected stakeholders.

- Buried Cultural Property Information System (Guide to Northern Ruins)
  http://www2.wagamachi-Guide.com/hokkai_bunka/
  A database of buried cultural property site (ruins) managed by the Board of Education, Hokkaido Prefecture. Ruins such as tombs, ruins of settlements, and *chashi* can be searchable from names of municipalities and the locations can be viewed in electric maps.

- List of Ainu place names
  http://www.pref.Hokkaido.LG.jp/KS/ass/new_timeilist.htm
  The list has been compiled by the Office of Ainu Measures Promotion of Hokkaido Prefectural Government. Ainu place names are important cultural heritage that reflects the knowledge and traditional culture that the Ainu Peoples developed in the course of long history.

1.2. Consultation

Consultation is a process to seek opinions from external organizations and people and discuss with them. Culturally appropriate engagement with experts and stakeholders are necessary for identification of HCVs. Sufficient consultations with local people and indigenous peoples are especially important for identification of HCV 5 and 6. Consultation should be conducted especially carefully with regards to the HCVs and areas that the collected information indicates potential presence of HCV.

1.2.1. Identification of Consultation Targets

As a first step, for each HCV category, make a list of stakeholders and experts in the area and sort out questions to ask and information needed from them. Below are examples of people that should be considered for consultation for each HCV category.

HCV 1 -3 (Species diversity, landscape-level ecosystems and mosaics, and ecosystems and habitats)

For identification of HCV on biodiversity, it is critical to involve experts. Here, experts do not only mean the people who have specific degree or qualification such as researchers, but can broadly

include anyone who have expertise, such as local nature lovers. Based on the information that have been collected, one should consult with individuals or organizations with expertise on important ecosystem or the rare species that are considered existent etc. It is also good to seek information of rare species from many people, instead of just asking the experts.

- Experts (researchers etc.)
- Relevant department of the local government, *e.g.* Department of the Natural Environment

  Some local governments provide information of people who have expertise in nature conservation and are available in the area, and can introduce suitable personnel upon request.
- NGOs (e.g. organizations for nature conservation, outdoor club, environmental education groups, academic society etc.)

  Environmental NGO with nation-wide network includes the Wild Bird Society of Japan and the Nature Conservation Society Japan (NACS-J). These organizations have chapters and member network nationwide, and have expertise of local nature including endangered species and environment indicator species.

  - The Wild Bird Society of Japan Chapter list
    http://www.wbsj.org/about-us/group/group-list/
  - NACS-J Nature Observation Instructor Network
    http://www.nacsj.or.jp/link/
- Environmental Qualification Holders (Including public and private qualification)

  Forest instructor (Japan Forest Recreation Association), green saver (Tree and Environment Network Association), Taxonomic Skill Test (Natural Environment Research Center), Biotope Management Professional (Ecosystem Conservation Society-Japan). In most cases, the organization that provides the qualification has the information of the network of the qualification holders.
- Frequent users of forests such as hunter, fisherman, hiker, nature photographer etc. and their groups and network.
- Local residents

HCV 4 (Critical ecosystem services)

- Experts (researchers etc.)
- Relevant department of the local government, *e.g.* Department of Environment, Department of Disaster Prevention etc.
- Beneficiaries of ecosystem services (*e.g.* user of spring water)
- Water service personnel
- Local erosion control volunteers

  Contact erosion control volunteer association of relevant prefecture for details.

- Local residents

HCV 5 (Community needs)

For identification of HCV 5, it is crucial to consult local people and indigenous peoples. First, identify indigenous peoples and local communities in the targeted area, and ask important sites for them. It is the local people and indigenous peoples who have lived in the area and have used the forest resources that determines existence of HCV 5. It cannot not be judged from outside.

- Indigenous peoples and their groups
  Example: Hokkaido Ainu Association, district Ainu Association, Ainu people who live around the forest. In case it is not known whether Ainu people are present in the area of interest, contact Hokkaido Ainu Association.
- Individuals and organizations engaged in hunting, gathering and fishing
- Individuals and groups who have the legal and customary use rights in the management unit
- Local residents
- Individuals and organizations engaged in the local traditional crafts

HCV 6 (Cultural values)

It is most efficient to conduct consultation for identification of HCV 6 together with the one for HCV 5. HCV 6 includes historical sites for which the value have been academically recognized such as castle ruins, shell mounds, ruins, remains of old structure, burial mounds, as well as sites that are known among limited number of local people such as the mountain god and sites of legend or folklore. The latter can be only identified through consultation with indigenous peoples and local people.

- Indigenous peoples and their groups (same as HCV 5 above)
- Experts in relevant field (archaeology, natural anthropology, cultural anthropology, history etc.)
- Personnel involved in designation of cultural property
- Museum and archives
- Relevant department of the local government (*e.g.* Board of education)
- Individuals familiar with the local culture and history

1.2.2. Consultation methods

Consultation can be conducted in various ways as listed below, but it needs be done in a culturally appropriate way that is easy for the consulted person. The contents of the consultation should be recorded and shared with the persons consulted to avoid flaw or misunderstanding in communication.

- Face-to-face interview
- Distribution of the questionnaire
- Phone interview, email inquiries
- Discussion and explanation at local gatherings
- Casually mentioning during daily communication
- Collaborative work on site (e.g. joint mapping)

In interviews, it is important to clarify the purpose of the consultation and to discuss and agree in advance on how the collected information will be treated (whether it will be made public or not). When consulting on sensitive issues or when conflict of opinions is expected, the work can be delegated to an independent third-party institution.

Since the term “HCV” is not a common word, it is better to start the consultation with simple questions using easy words such as “How do you use forests?” and “What animals have you seen?” Then following the flow of conversation, more specific questions can be asked, such as “Is there any place that are particularly important for that?” For interview with experts, it is important to prepare specific questions based on the collected information and according to his/her expertise.

1.3. On-site Survey

After narrowing down the potential areas of HCV based on the existing information and consultations, it is necessary to actually study the sites to confirm whether they really constitute HCV. Some field survey entails considerable expertise. For biological survey in particular, method to be employed varies depending on the species of interest, and the assessors’ knowledge and skills, the time of year and day to take the data heavily affects the outcome. For social HCV (HCV 5 and 6), it is important to conduct the field survey and check the site together with the stakeholders who recognize the HCV, local people, and indigenous peoples who hold rights.

The field surveys are important in various steps including HCV identification, boundary delineation (zoning), development of conservation and management measures as well as monitoring. When conducting the field survey for HCV identification, it is good to discuss the management methods at the same time. The outcome of field survey for HCV identification can be also utilized as the baseline for consequent monitoring of the HCV.

1.4. Identification of HCVs

When identifying HCVs and delineating the boundaries, it is vital to take the precautionary approach. Even when the presence of HCV is not confirmed and it is not known how vulnerable it would be, if there is a risk that the presumed HCV may get irreversible damage, the risk shall be avoided by precautionary assuming presence of HCV.

For example, while witnessing just one individual of an endangered species does not directly lead to a conclusion that the site is HCV1, if it is likely that the area hosts a sizable population of the species, it would be appropriate to consider the area as HCV1 as a precautionary measure. If the species is very rare and has not been witnessed for a long time, it would be better to make the site as HCV1 considering the risk. Furthermore, even when each species of fauna and flora has not been identified, if the area preserves a rich natural ecosystem that is likely to host variety of species, it can be considered HCV1.

It should be noted that HCV does not always exist in the target area, and the FSC standard does not require the existence of HCV itself. Thus it is possible to have a conclusion that no area is identified to have HCV as a result of the assessment. It is also possible that something that hints the existence of HCV is found later in an area where no HCV had been found in a previous assessment. In such a case, the area should re-evaluated to determine whether the area really has HCV.

For most HCVs, it is difficult to clearly delineate boundaries. Still, for the purpose of management, it is necessary to define the sites or areas of HCVs, as well as the area necessary to support and manage the HCVs, and share the information with relevant stakeholders. The best way to do so is to conduct the HCV identification and boundary delineation collaboratively with the local stakeholders, possibly in the field, and discuss the management strategy in advance.

For the identified HCVs, the location/area shall be mapped, and the type (HCV category), characteristics and their values compiled into a list. This record needs to be shared at least with the affected stakeholders, but whether or not it should be made public needs careful consideration. Information of some HCV may be sensitive; for example, an endangered species may get over-exploited once the location of their habitats is disclosed. There are also cases where privacy of the concerned parties needs to be respected. Thus disclosure of information to the public should be discussed and agreed in advance with stakeholders.

1.5 Review of HCV Assessment

The HCV assessment must be reviewed and updated as necessary, when there is a change in relevant laws and circumstances, and new scientific finding, for example. It shall be reviewed at least once in five years to confirm that the content of the assessment remains relevant against the latest situation.

2. HCV Management

<This chapter applies only when HCV is identified in the previous chapter.>

The overall aim of HCV management is to maintain and, where possible enhance the identified HCVs as part of responsible management. Organizations needs to develop management strategies for HCVs identified as a result of an HCV assessment, and transform the strategies into more specific management prescriptions that can be implemented. The management needs to be operated through the dynamic adaptive management cycle of planning, action, monitoring, and improvement.

2.1. Developing an HCV Management Plan

In order to manage HCVs properly based on the recommendations of the HCV assessment, HCV management plan shall be developed. The level of detail required will depend on the scale, intensity and risk of the production activities, but following elements should be included.

A. Description and location of each HCV present

Value of each HCV, significance, nature, characteristics, and HCV category etc. To avoid negative impact of forestry operations, determine the boundary of HCV management area necessary to protect HCVs and map the HCV location and the management area in advance before the operation starts.

B. Establishment of baseline

Record of initial state or reference value data that serve as a basis for studying the effectiveness of management activities. The baseline is usually the condition at the time of the initial assessment, but in case of ecosystem restoration project, it can be set as a state before degradation. The baseline data should contain sufficient details to be comparable with monitoring data to detect changes over time.

C. HCV management strategies and targets

In addition to general HCV management objectives in accordance with the definition of each HCV category, more specific, if possible quantitative, measurable targets that are directly linked to management activities and monitoring indicators should be established. If detailed baseline data are available, it is easy to set a specific target. Otherwise, based on the precautionary principle, a broader target can be set.

D. Assessment of threats to HCVs

For each identified HCV, threats should be identified and its degree evaluated. This identification and evaluation of threats can be conducted at the same time as the HCV assessment. When evaluating,

determine their priorities considering the following aspects and characteristics of the threats.

Direct vs. Indirect threats: Direct threats are relatively easy to identify, but it is important to identify indirect ones that include underlying causes that are not visible at the first glance. For example, behind the direct problem of trespassing, there may be a hidden cause such as unclear defined boundaries.

Internal vs. external threats: While managers often focus on external threats (e.g. pest, trespassing), but it is important to pay attention to internal threats such as the operation by the organization.

Common threats to Japanese forests include development (infrastructure building, etc.), forestry operations, pest, invasive alien species, unauthorized activities, abandonment of forestry, natural disasters.

The IUCN threat classification system in Appendix 1 classifies direct threats to specific types of conservation and systematizes their evaluation methods, and it can be used as a tool for threat evaluation.

E. Consultation with stakeholders and experts

Engagement with stakeholders and consultation with experts, in order to gain their cooperation and understanding for HCV management, as well as to ensure that management activities are in line with the latest scientific findings. See Section 2.2.

F. Development and implementation of effective management strategies

Description of strategies for management of HCVs and how they will be implemented, based on stakeholder and expert consultation. For details, see Section 2.3.

G. Development and implementation of monitoring plan

A work plan to observe or study the condition of HCV, the surrounding environment, and impact of management activities and to evaluate their changes. For details, see section 3.

H. Adaptive management strategies, based on monitoring results

A clear description of the process to incorporate the monitoring results into management, in order to maintain or improve HCVs amid the ever-changing environment and social conditions. For details, see Section 4.

2.2. Consultation with Stakeholders and Experts

Engagement with stakeholders and consultation with experts is important in order to gain their cooperation and understanding for HCV management, as well as to ensure that management activities are technically sound and in line with the latest scientific findings. As with the HCV identification process, the

stakeholders listed in Section 1.2.1 should be considered as the potential targets for consultation. When HCV1-3 are identified, it is essential to consult with experts such as researchers, environmental NGOs, and relevant administrative departments. On the other hand, continuous use by rights holders (e.g. indigenous people, local communities) is assumed for HCV5, and 6, for which the people's use is the basis of their value. HCV management is not possible without their cooperation.

When consulting with rights holders, it should be conducted in culturally appropriate manner based on the principles of FPIC (free, prior, informed consent). It may take time to obtain an FPIC from rights holders, for rights holders must fully understand the relevant information and their rights and voluntarily participate in the process. In particular, organizations that manage forests on behalf of others, such as a cooperative of forest owners, cannot determine and implement management strategies alone. Sufficient effort must be spent to engage with forest owners to earn their trust and cooperation. Care must also be taken to ensure that marginalized stakeholder groups are left behind in the process.

Consultation can be conducted through participatory mapping, for example. Through the process, organizations and rights holders can work together to verify the area where the rights holders claim their rights, and record it in a map. It can be easily implemented by visiting the field together and recording the location through GPS and smartphones.

Records of the consultation must be kept with the results so that it can be presented during audits. The record should be shared with the consulted stakeholders, unless there is a problem (e.g. confidentiality). For larger organizations, it is desirable to share a draft with stakeholders during the management planning phase.

2.3. Management Strategies

In order to maintain HCVs into the future, it is critical to develop specific management strategies and prescriptions. It is important that the HCV management strategies and prescription is integrated in the overall forest management system to ensure that HCV management activities do not conflict with other management activities and are implemented effectively.

In developing management strategies and prescriptions, following two aspects needs to be considered:

1. **Spatial planning for management (Zoning):** Determine areas necessary to support HCVs and divide into areas for which different management prescriptions (e.g. no hunting or logging, changes to silvicultural operations, setting nest boxes, restricted access) are applied. Some HCVs are more protected effectively with landscape mosaic consisting of patches arranged in a matrix rather than strict protection in limited area. As such, size and arrangement of different management zones should take into account the nature of the targeted HCV.

2. Management prescriptions: Define the specific management activities or practices to be implemented in each management area.

While people are prone to think that conservation means no logging, but various measures are possible depending on the applicable regulation, nature of HCV, threats, and available resources (human, economic, and technical resources) etc. What is important is to maintain or improve the identified conservation value; HCV conservation does not necessarily contradict with production activities of forestry. Even in natural ecosystems, animals and plants are adapted to disturbances, and a management prescription that mimics natural disturbance is appropriate or even desirable. For example, in plantation, thinning is necessary to maintain and improve the watershed service of the forest. Small-scale clear cutting may be also appropriate to create a hunting ground for raptors.

Areas with legal designation need to be managed according to the laws and regulations. Mere compliance with laws and regulations may be sufficient to protect some HCVs, but if not, additional prescription should be sought based on applicable resources and materials (e.g. recommendations from advisory bodies for World Heritage Sites, reports).

Scientific, professional, and highly technical measures are not necessarily the best as an HCV management measure. Rather, simple, straightforward, and realistic measures are often better, for it is easier for the management side to carry on.

It is also necessary to take measures to mitigate the impact of the identified threats. In so doing, it is important to identify and take measures against not only the direct, visible threats, but also the hidden, fundamental problems that have caused to the problem. For example, land ownership issues may arise as a cause of management abandonment and illegal activities. While it is complex and time consuming to tackle such indirect causes, addressing them is central to the problem solving.

Furthermore, it would be effective to involve stakeholders in HCV management. Better outcome can be expected by sharing the problem with local governments, research institutions, local people, NPOs and other stakeholders and seeking volunteers to work together. For example, it is possible to provide the area to research institutions such as universities as a research field and have them monitor the area. Simple measures such as cleaning and installation of nest boxes can be carried out by schools, natural education groups and NPOs as a program of environmental education, which will have long-term benefit. Such measures not only enhance environmental awareness among local people but also reduce administrative burden of the organization.

After management prescription has been determined, an action plan need to be prepared for implementation. The HCV management plan should include specific information such as date or season of implementation, responsible person, location, number of people for the work, and any organization cooperating for the work.

Table 3: Examples of management measures

Category of identified HCV	Consideration to be made	Example of management measures
1 (Species diversity)	• Life history of target species (seasonal habitat, habitat requirement for different life stages, diet, refuge, range, mobility, reproductive requirements etc.) • Habitat size and quality based on the life history of target species • Species associations (interspecific competition, mutualism between plants and seed disperser or pollinator, etc.). • Ecological niche of target species	• Establishing protected areas appropriate to the ecology of the species of concern • Establishment of wildlife corridors to connect fragmented habitats • Habitat management of protected species (*e.g.* establishing hunting ground for raptors, preservation of nesting trees and snags, setting nest boxes and fishway, protection of prey species)[8] • Control of information on habitats of species to be protected • Management and control of natural enemy, competitive species, pests and disease • Control of invasive exotic species • Restriction of forestry operations and review of the methods (including adjusting timing of operations, limiting the area for operation, and no logging) • Boundary management (including control of access) • Establishing and managing buffer zones • Restricting use (*e.g.* control of hunting and gathering, limiting access) • Campaigns to raise awareness (including eco-tourism) • Academic research in collaboration with research institutions such as universities. • Creation of diverse landscape that hosts diverse species (diversification of stand age and species) • Restoration of degraded areas
2 (Landscape-level ecosystems and mosaics)	• Location and size of conservation areas outside the management unit • Connectivity with other conservation area • Land use of surrounding area	
3 (Ecosystems and habitats)	• Nature and characteristics of the targeted ecosystem (soil, natural disturbance, fauna and flora) • Threats that have caused reduction of the ecosystem to be conserved	
4 (Critical ecosystem services)	• Soil property • Type and nature of natural disturbance	Water conservation, soil conservation, and sediment-related disaster prevention: • Compliance with the designated operational requirements for protection forest • Proper thinning of plantation • Restoration in degraded ecosystem • Control of pest animals *e.g.* deer • Prevention and mitigation of damage by pest and disease • Forestry operation that minimizes impact to forests

[8] Raptors at the top of the food chain are often considered as indicator species to measure integrity of forest ecosystem, yet many of the species are endangered. For conservation of raptors, see “How to conserve raptors” published by the Ministry of the Environment. https://www.env.go.jp/press/files/jp/22992.pdf

		• Road construction considering vulnerability of sites (steep slope, drainage, geology) • Conservation of understory vegetation • Maintenance of vegetation in steep slopes and riparian zones • Restriction of forestry operation in bad weather Water conservation: • Control of waste dumping • Control of wastewater inflow • Restriction on use of pesticides and fertilizers • No use of pesticide and fertilizers along watercourse • Prevention of water pollution Soil, sediment-related disaster prevention • Proper construction of hillside and river banks • Implementation of proper construction projects to prevent and control erosion and sediment-related disaster with consideration for the environment and ecosystem
5 (Community needs)	• Current status of use of forest resources by local communities and indigenous peoples (if there is any use at present, consider that local communities and indigenous peoples have a de facto right to use) • Changes in the circumstances surrounding local communities and indigenous peoples (ecological and socioeconomic)	• Zoning and mapping through culturally appropriate engagement with rights holders • Harvest of NTFP at sustainable level • Regular patrol through engagement with local communities and indigenous peoples • Provision of alternative item, place or compensation (if possible, with FPIC obtained) • Move of HCV (If possible, with FPIC obtained) • Restricting access of organization's employees for purposes other than monitoring • Restriction on use by external parties (control of hunting, collection of plants and animals, control of access) • Restoration of degraded ecosystem and its monitoring through engagement with rights holders • Proactive management by local people and indigenous peoples • Establishing local rules on use through engagement with stakeholders • Continuous engagement with local communities, sharing information and consultation • Restriction of forestry operations and review of the methods (including
6 (Cultural values)	• Nature of value to be protected (historical, religious, spiritual etc.) • Customs of local community and indigenous peoples and their aspiration in use • Changes in the circumstances surrounding local communities and indigenous peoples (ecological and socioeconomic)	

		adjusting timing of operations, limiting the area for operation, and no logging) • Establishment and management of buffer zones • Clarification of boundaries in maps and on site • Management of archaeological sites etc. with stakeholders (e.g. indigenous peoples) and experts based on the ethical standards of social and anthropological research. • Continuous use of Ainu place names (For HCV6 in Hokkaido)

When overlapping of different HCV results in conflict of management measures

It is possible that management strategies for conservation of different HCVs in the same forest area contradict with each other. For example, when a medicinal plant that local communities have long been using become endangered, a conflict arises between conservation of HCV1 and continuing traditional use for HCV5.

There is no simple solution to resolve such a conflict. Instead of simply deciding on one of the measures by the majority vote, it is better to seek mutually acceptable solution by discussion among stakeholders and consulting with experts. What is important is the process to reach the consensus, and the consultation must be conducted in a way in which transparency and fairness is ensured and that stakeholders are provided with equal opportunity to state their opinions. The solution is case-by-case and the process may take some time. However, in the long run, getting prior agreement from stakeholders is the best way to solve the problem and ensure successful management.

Record of Management Activities

Record of implementation of management activities must be maintained together with the monitoring record described in the following chapter. The record can take various forms; from notes of daily patrol to filled-in forms using pre-determined template. What is appropriate may vary depending on the content of the work, scale and risk. It would be good to determine the person responsible for each type of record and how it will be made, and prepare record templates (forms) when developing a plan for management activities. Generally, records of management activities include date, person, content of the work, and location (area). Some may also include description, photos and checklists. It would be good idea to involve stakeholders in determining how the records should be made for HCV 5 and 6, which concerns their rights.

3. Monitoring of HCV

Monitoring means “checking to see what is happening.” It has to be conducted to confirm that HCV management strategies and prescriptions are implemented properly and that management objectives are being met (i.e., whether HCV is maintained). One of the general and on-going objectives of monitoring is the gradual build-up of information about the site and the HCVs present, which enables managers to continuously improve and build upon past experience.

Unlike assessments, monitoring does not have to be a complete survey and can be done effectively using indicators etc. Although specific HCV monitoring results do not necessarily tell the cause of HCV changes, consistent monitoring is crucial to learn the status of HCVs, their changes and long-term trends.

3.1. Types of Monitoring

Monitoring should be able to measure the effectiveness of HCV management and to detect decline of HCV and its reason, if it occurs. However, in reality, it is difficult to capture the condition and identify the cause, for the following can all contribute to decline of HCV.

- **Practical barriers to management implementation.** Management strategies may have a strong theoretical evidence base, but may be challenging to implement on the ground. For example, enrichment planting has been conducted as a measure to restore a degraded site, but the seedling did not survive. Another example is the management tried to recruit volunteers for forest management, but may not be able to secure sufficient number of volunteers.

- **Poor implementation of management strategies.** Even the most robust management strategies can be ineffective if poorly implemented. For example, a conservation area is unlikely to effectively maintain an HCV unless it is combined with patrols to prevent illegal or restricted activities.

- **New or changing threats / conditions.** Management strategies that are effective at one point in time may not always be effective when circumstances change. For example, changes in the wider landscape, such as increased population of deer may lead to increased pressure on vegetation. Organizations are not held responsible for changes that are beyond their control (e.g. climate change).

To distinguish the true cause of a decline of HCV, it is essential to monitor: 1) the implementation of management plans (operational monitoring); 2) whether HCVs are being maintained by current management plans (strategic / effectiveness monitoring; and 3) Threats to HCVs (threat monitoring).

1. Operational monitoring

   Operational monitoring evaluates whether management plans are being implemented. Examples include, monitoring of SOPs relating to road construction, harvesting operations, waste management and maintenance of HCV area boundaries. Operational monitoring should be carried out frequently enough to uncover areas of concern to be followed up by more targeted monitoring.

2. Strategic/effectiveness monitoring

   Strategic/effectiveness monitoring aims to assess whether management objectives and targets set out in the management plan are being met, and whether management prescriptions are effective in maintaining the HCVs. Strategic monitoring focuses on assessing longer-term trends in the status of HCVs and, therefore, tends to be conducted less frequently than operational monitoring but typically requires more time-consuming techniques and analysis. Examples of strategic monitoring techniques include flora and fauna surveys and community interviews.

3. Threat monitoring

   Threat monitoring aims to assess internal and external threats identified during the initial threat assessment process and assesses whether new threats have developed. It can involve targeted monitoring of threat indicators (e.g. water quality monitoring), threats recorded opportunistically during operational monitoring and interviews or discussions with people that can potentially cause the threat.

3.2. Developing an HCV monitoring plan

A monitoring plan should describe in detail what is being monitored, how it will be monitored, the personnel involved in monitoring and their roles, when and where monitoring will be conducted and the process for reviewing monitoring data. Monitoring plans should be derived from management objectives. Specific management objectives and targets should be used to define appropriate monitoring indicators.

It is important that monitoring plans are scientifically robust, standardized and repeatable, while using resources (time and money) efficiently. An efficient monitoring plan should assess whether HCVs are being maintained, using as little time and money as possible, without compromising quality. Appropriate frequency and intensity of monitoring depends on the risks posed to HCV; extensive and time-consuming monitoring would not be necessary unless there is a considerable risk.

3.2.1 Choosing indicators

When developing a monitoring plan, it is important to identify effective indicators that are relatively easily measurable and directly tied to management objectives and targets. Poorly chosen indicators can be difficult or expensive to monitor, and can betray the whole purpose of monitoring.

A good indicator is described as “SMART”, which is a mnemonic for the important characteristics of a good indicator:

- Specific: accurately refer to a single HCV;
- Measurable: specify thresholds that are measurable at a reasonable cost;
- Achievable: should not require excessive technical, financial or resource inputs;
- Relevant: focused on achieving HCV management objectives;
- Tangible: defined clearly and free from subjective elements.

While operational indicators tend to be straightforward to define based on the SOPs, HCVs and threats can be measured in multiple ways, making it especially important to have clearly defined indicators. Identifying useful indicators can be done in consultation with experts, NGOs or relevant literature.

Indicators can be direct or indirect. Direct indicators measure the status of the HCV itself and the progress toward the management objective, whilst indirect indicators are proxies that can be used to assess the status of an HCV. Direct indicators monitoring can include, for example, direct observations of HCV 1 species, water quality parameters (HCV 4) and the quantity of forest products collected by a community (HCV 5) as strategic monitoring, and area damaged by pest animals as threat monitoring. For indirect indicators, keystone or indicator species that are indicative of certain ecosystem types or habitat quality can be used for HCV 2, 3 and 4.

3.2.2. Baseline data

Whenever possible, monitoring should start before management activities are implemented to establish baseline conditions, which provide a reference level against which subsequent monitoring data can be compared to. Baseline data can come from HCV assessments, wherever feasible, monitoring plans should use similar methods, sampling frequencies and intensities to those used during baseline surveys, so that results are comparable.

Ongoing monitoring is vital for assessing trends in HCVs. Ongoing monitoring does not always have to be labor-intensive, as even carefully recorded observations from daily patrols can be used to assess HCV status.

3.2.3. Roles and responsibilities

HCV monitoring can be carried out internally by Organization staff or in collaboration with external experts, such as academics or NGOs. Monitoring social HCVs (HCV 5-6) should always be done in consultation with community representatives. However, the overall responsibility for the monitoring plan should belong to a specific senior manager of the Organization, who will ensure that data are properly collected and analyzed, and that results are used for adaptive management. The manager needs to be aware of both their internal capacity to conduct HCV monitoring as well as available external resources, and consider the costs and complexity of monitoring to implement effective monitoring.

It is important to define in advance the qualifications and requirements of the person conducting the monitoring to ensure that the activity is carried out with proper knowledge and skills. In case internal capacity is lacking, appropriate measures need to be taken to make up for it, such as collaboration with the external organization and training for relevant personnel.

3.2.4. Involving stakeholders and experts in monitoring

Local stakeholders

Involving local communities is a very effective approach of monitoring. It not only helps to access unique information founded on their local life and tradition, but also helps to keep the process of HCV management transparent and builds cooperative relationship and trusts with local communities. Moreover, involving local environmental and educational group in the monitoring activities will help reduce the burden of the managers and ensure the technical quality.

Monitoring of HCVs 5 and 6 should check whether the level of dependence on HCVs has changed over time and whether resources are being harvested sustainably by communities. Methods of monitoring HCVs 5 and 6 need to be culturally appropriate and the monitoring results needs be communicated to communities. Involving local communities in biodiversity and ecosystem monitoring may also allow access to information that would not otherwise be available, as the local people would have good understanding of abundance and distribution of local species and sense of their long-term trend.

Experts

Monitoring of HCVs 1-3 may require botanical, botanical or zoological knowledge. If internal expertise is lacking then consultation with experts when developing a monitoring plan is recommended. It would be best to find an expert with interest in local ecology, and maintain a good long-term relationship with them, so that taking part in the activity will be their benefit as well. Consulting experts early on can help to design a cost-effective monitoring process and avoid expensive corrective action. In would be also a good strategy to foster internal capacity by organize training of internal staff by relevant experts. As

monitoring data are collected, the results should be communicated to experts, who can help to interpret findings and inform adaptive management decisions.

3.3. Monitoring techniques

Determining Monitoring Method

In order to collect the data comparable over time, monitoring needs to be conducted regularly using the same method. Thus the methods need to be defined in a manual, in which specific methods, monitoring frequency, scheduled date (and time), tool, location, and responsible person should be specified. It is better to prepare templates such as a check sheet or recording form that can be used in the field. When training is necessary in order to conduct reliable monitoring, it needs to be planned and implemented accordingly. At that time, if multiple persons conduct the same monitoring work, it is better to exchange information and calibrate how they measure, so that there would not be difference in the way they evaluate and measure. If there is any discrepancy, it is necessary to discuss and revise the manual as necessary to avoid recurrence of misunderstanding in the future.

Methods of monitoring can vary from patrol to observe whether there is any disturbance, quantitative measuring using professional equipment to openly seeking information of sighting. The monitoring method does not have to be scientific or quantitative. Considering the threat to HCV, speed of the change of the surrounding environment, cost and organization's capacity, it is better to choose the most effective and convenient method that can be continued without much difficulty. The ease of analysis should be also taken into consideration.

Records of monitoring must be kept. It is important to keep not only the summary of the collected information but also raw records from data collection (*e.g.* patrol logs and recording form filled out by hand in the field). In particular, when conducting an interview, the content should be reviewed and confirmed by the interviewees. Such communication should be also kept, so that it can be reviewed in case any issue arises.

HCV 1-3 (Species diversity, landscape-level ecosystems and mosaics, and ecosystems and habitats)

Patrols: Patrol varies widely from daily informal one to a more focused, carefully designed one. Regarding animal sighting information, record the following information: as much details as possible about the animal (species, sex, age, size, behavior etc.), place of sighting (geographical coordinates, vegetation and features of surrounding environment), date and time, and photo (if possible). For traces and signs of animals, type (feces, footprints, signs and marks on food, nest, burrows, dens and shelters, mud holes/baths, rubbing mark, scratch marks etc.), age of the sign (estimated time lapse

since the time sign was made). It is a good idea to ask hunters who regularly patrol the area for hunting for collaboration.

- **Faunal and floral surveys:** Surveys are the main type of strategic monitoring for studying the status of specific species under threat, and it does not have to be conducted as frequently as patrols. They require standardized and repeatable methods so that the data can be reliably compared. For monitoring of HCV 1 animal species, managers should ensure that monitoring takes into account various conditions such as life history of the species, daily and seasonal variations in species activity and climate. In the case of HCV 2 and 3, it would be effective to carefully select a small number of indicators which, if present, suggest that the ecosystem or habitat as a whole remains healthy. Alternatively, structural composition and absence of threats can be monitored to assess overall health and integrity of the ecosystem. For data management for conservation activities, many environmental NGOs and institutions together developed a software SMART (Spatial Monitoring and Reporting Tool). The software is freely available from the internet, but not in Japanese, unfortunately.

  Biodiversity monitoring activities can be incorporated into the program of environmental education and integrated learning in cooperation with local schools. For example, simple surveys such as surveys of aquatic invertebrates could be made into a regular event conducted by students or pupils of a particular grade. This will give different children equal opportunities to learn about their surrounding environment: a significant experience in terms of environmental education. In addition, data collector's skills are kept constant by design, ensuring that there is little data bias due to their ability of data collectors.

  For monitoring of rare, threatened and endangered species, it is relatively easy to get technical support or cooperation from NPOs and researchers. It is a good idea to use recreational and educational events such as bird watching and solicit sightings from the participants, though the data may be less accurate.

- **Remote Sensing:** Remote sensing, including aerial photography and satellite images, is a very effective tool, especially for monitoring ecosystems and habitats over large areas of HCV2, 3. Recent development of remote sensing technology is remarkable, and various convenient tools are available. Google Earth is the leading free remote sensing software, also available in Japanese, which allows you to view current and past satellite images and aerial photographs at considerable resolution for free. It allows comparison of the present and past imagery, and provides 3D images that closely reflect the actual terrain. The tool can be used widely for forest management in general, including monitoring of remote areas that are not easily accessible. QGIS, a free GIS software, not only shows images, but

also allows you to analyze data. ArcReader is another free GIS software, but it is not available in Japanese.

Global Forest Watch is a tool that allows you to see changes in forest cover over time. It also provides data analysis of current forest cover for each forest type (plantation / natural forest) and their change over time, but it is not available in Japanese.

It is highly recommended to consult the government for utilization of remote sensing in forestry in general, not only limited to HCV monitoring. The government is actively promoting the use of remote sensing in forestry, so they may be able to provide technical and/or economic support. It is encouraged to actively seek latest information in the internet, as a variety of information and materials on utilization and techniques of remote sensing are available on the Internet.

HCV 4 (Critical ecosystem services)

Items to be monitored and indicators to be used varies widely depending on the type of ecosystem services. Possible monitoring indicators include: water quality and quantity (water depth), soil cover, frequency of sediment-related disasters and flood, and frequency of forest fire.

The effectiveness of erosion controls can be monitored by measuring water quality and sediment loads in the catchments. However, the results should be interpreted carefully taking into account that these measurements can readily be altered by climatic or external factors such as rainfall, season or upstream land uses.

Possible measures of monitoring include monitoring of unauthorized activities and water quality, surveys of designated sites and areas for sediment-related disasters, patrol for disaster prevention in cooperation with relevant local stakeholders including local government officials, water suppliers, disaster prevention volunteers, etc. The overall condition of forest can be also monitored by remote sensing.

HCV 5, 6 (Local community needs, cultural values)

With respect to socio-cultural values, the participation of local people and indigenous peoples identified during the assessment is essential. Agree with them on monitoring methods in advance and regularly discuss the conditions of HCVs and their use. It is also effective to involve them in on-site monitoring. As with assessments, the consultation or engagement should be conducted in an appropriate manner that is culturally acceptable, and such as interviews and group discussions, and the records should be shared by both parties. When conducting interviews, consideration must be made so that socially marginalized people can be heard. The information from interviews and consultations is often subjective, so it is important to verify the information with that of different type or interview with other stakeholders.

It is often difficult to monitor HCV5 and 6 quantitatively. Efforts should be made to make comparable record, by standardizing the format with checklist for example, or using photographs.

4. Adaptive Management

It is rarely the case that complete information is available on HCV before starting the management activities. As such, it is important to minimize the risk by taking precautionary approach, and to improve management practice through adaptive management cycle as experiences are gained and lessons are learned.

The monitoring results should be reviewed at least once a year to check the progress toward the target and management goals. If the results suggest that HCV is not maintained properly, the management strategies should be reworked. Management activities of the organization may not be solely responsible for the degradation of HCV; it may be attributable to third parties or factors beyond the control of the organization (*e.g.* climate change). It is desirable that monitoring methods are designed in a way that allows distinguishing the causes. Some important questions to consider when reviewing management effectiveness are:

- What changes have taken place in the HCVs, and what caused them?
- Are the planned management strategies and prescriptions being implemented?
- Have the risks and threats facing HCVs changed?
- How effective are the management strategies?
- Are monitoring strategies effectively identifying threats to HCVs and changes in HCV status?

4.1. Reviewing results and objectives

Managers need to interpret monitoring data to decide what change in an HCV or indicator should lead to a change in management (i.e. to identify the threshold for management action). However, identifying this threshold can be difficult, as there is always some fluctuation and error in data, especially in ecological or social ones, for which many factors cannot be controlled. Fluctuation may also arise from difference in conditions when the data are collected. To accurately interpret the data and detect a meaningful change, a solid understanding of indicators, and how they can be expected to vary over time and place, is critical. Accumulation of data over long period of time would also make it easier to discern the margin of error and reveal long-term trends and any aberrant change. If the results of monitoring remain unclear it will be good to consult relevant experts for their interpretation and advice on the development of new, clearer indicators.

Interpretation of monitoring data can help to establish whether an HCV is declining because of weak management implementation, ineffective management strategies or new/increasing threats. This should be followed by determination of whether management changes are required.

More frequent monitoring may be needed if the status of an HCV is of particular concern and has the potential to decline very rapidly, for example, if there is evidence of illegal harvesting of the only known population of a critically endangered plant. Extra monitoring may cost more in the short term, but a proactive approach to adaptive management can save costs over time by avoiding the need to restore HCVs (or the costs of losing certification status).

4.2. Using monitoring results to improve management

Understanding the cause of a decline in an HCV can inform appropriate management changes. For example, the adaptive management response to a decline caused by weak management implementation may be to have stricter operational monitoring, whereas addressing new threats could require entirely new management strategies. Simply changing management strategies may not always be sufficient to maintain an HCV. For example, in cases where monitoring shows that production activities have caused a significant decline in an HCV then rehabilitation strategies (e.g. forest restoration) should be implemented to restore the HCV to its baseline level.

It is highly likely that the status of HCVs and threats to them will continue changing over time, especially because there is often a lag period between disturbances and the response of ecological/biological processes. Likewise, socioeconomic contexts can also be expected to change over time. Therefore, to ensure HCVs are maintained over time, the adaptive management and monitoring process should continue throughout the lifetime of the production activities, appropriate to the scale, intensity and risk of threats to HCVs (e.g. intensity of production activities).

Appendix

Appendix 1: Composition of HCV Assessment Report

The following is the structure of the HCV assessment report used in the HCV Assessor Licensing Scheme of the HCV Resource Network (ALS_02_F, March 2019 version). This report template assumes that a team of qualified and licensed professionals are commissioned by the organization to conduct an HCV assessment before the organization starts management activities. In the HCV Assessor Licensing Scheme, reports are written with this template, reviewed and approved. It does not necessarily match the current circumstances of Japan, but this structure can be used as a reference. Report templates are updated from time to time, and the latest version can be downloaded from the HCV Resource Network website:

Appendix 2: IUCN Threat Classification System (ver. 3.2)

A system to classify and evaluate threats to species. This system has been developed by many organizations engaged in natural resources management and conservation.
http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme

- 1 Residential & commercial development
  - 1.1 Housing & urban areas
  - 1.2 Commercial & industrial areas
  - 1.3 Tourism & recreation areas
- 2 Agriculture & aquaculture
  - 2.1 Annual & perennial non-timber crops
    - 2.1.1 Shifting agriculture
    - 2.1.2 Small-holder farming
    - 2.1.3 Agro-industry farming
    - 2.1.4 Scale Unknown/Unrecorded
  - 2.2 Wood & pulp plantations
    - 2.2.1 Small-holder plantations
    - 2.2.2 Agro-industry plantations
    - 2.2.3 Scale Unknown/Unrecorded
  - 2.3 Livestock farming & ranching
    - 2.3.1 Nomadic grazing
    - 2.3.2 Small-holder grazing, ranching or farming
    - 2.3.3 Agro-industry grazing, ranching or farming
    - 2.3.4 Scale Unknown/Unrecorded
  - 2.4 Marine & freshwater aquaculture
    - 2.4.1 Subsistence/artisanal aquaculture
    - 2.4.2 Industrial aquaculture
    - 2.4.3 Scale Unknown/Unrecorded
- 3 Energy production & mining
  - 3.1 Oil & gas drilling
  - 3.2 Mining & quarrying
  - 3.3 Renewable energy
- 4 Transportation & service corridors
  - 4.1 Roads & railroads
  - 4.2 Utility & service lines
  - 4.3 Shipping lanes
  - 4.4 Flight paths

- 5 Biological resource use
  - 5.1 Hunting & collecting terrestrial animals
    - 5.1.1 Intentional use (species being assessed is the target)
    - 5.1.2 Unintentional effects (species being assessed is not the target)
    - 5.1.3 Persecution/control
    - 5.1.4 Motivation Unknown/Unrecorded
  - 5.2 Gathering terrestrial plants
    - 5.2.1 Intentional use (species being assessed is the target)
    - 5.2.2 Unintentional effects (species being assessed is not the target)
    - 5.2.3 Persecution/control
    - 5.2.4 Motivation Unknown/Unrecorded
  - 5.3 Logging & wood harvesting
    - 5.3.1 Intentional use: subsistence/small scale (species being assessed is the target [harvest]
    - 5.3.2 Intentional use: large scale (species being assessed is the target) [harvest]
    - 5.3.3 Unintentional effects: subsistence/small scale (species being assessed is not the target) [harvest]
    - 5.3.4 Unintentional effects: large scale (species being assessed is not the target) [harvest]
    - 5.3.5 Motivation Unknown/Unrecorded
  - 5.4 Fishing & harvesting aquatic resources
    - 5.4.1 Intentional use: subsistence/small scale (species being assessed is the target) [harvest]
    - 5.4.2 Intentional use: large scale (species being assessed is the target) [harvest]
    - 5.4.3 Unintentional effects: subsistence/small scale (species being assessed is not the target) [harvest]
    - 5.4.4 Unintentional effects: large scale (species being assessed is not the target) [harvest]
    - 5.4.5 Persecution/control
    - 5.4.6 Motivation Unknown/Unrecorded
- 6 Human intrusions & disturbance
  - 6.1 Recreational activities
  - 6.2 War, civil unrest & military exercises
  - 6.3 Work & other activities
- 7 Natural system modifications
  - 7.1 Fire & fire suppression
    - 7.1.1 Increase in fire frequency/intensity
    - 7.1.2 Suppression in fire frequency/intensity
    - 7.1.3 Trend Unknown/Unrecorded
  - 7.2 Dams & water management/use
    - 7.2.1 Abstraction of surface water (domestic use)
    - 7.2.2 Abstraction of surface water (commercial use)

- 7.2.3 Abstraction of surface water (agricultural use)
- 7.2.4 Abstraction of surface water (unknown use)
- 7.2.5 Abstraction of ground water (domestic use)
- 7.2.6 Abstraction of ground water (commercial use)
- 7.2.7 Abstraction of ground water (agricultural use)
- 7.2.8 Abstraction of ground water (unknown use)
- 7.2.9 Small dams
- 7.2.10 Large dams
- 7.2.11 Dams (size unknown)

7.3 Other ecosystem modifications

8 Invasive & other problematic species, genes & diseases

8.1 Invasive non-native/alien species/diseases

- 8.1.1 Unspecified species
- 8.1.2 Named species

8.2 Problematic native species/diseases

- 8.2.1 Unspecified species
- 8.2.2 Named species

8.3 Introduced genetic material

8.4 Problematic species/diseases of unknown origin

- 8.4.1 Unspecified species
- 8.4.2 Named species

8.5 Viral/prion-induced diseases

- 8.5.1 Unspecified "species" (disease)
- 8.5.2 Named "species" (disease)

8.6 Diseases of unknown cause

9 Pollution

9.1 Domestic & urban waste water

- 9.1.1 Sewage
- 9.1.2 Run-off
- 9.1.3 Type Unknown/Unrecorded

9.2 Industrial & military effluents

- 9.2.1 Oil spills
- 9.2.2 Seepage from mining
- 9.2.3 Type Unknown/Unrecorded

10 Geological events

10.1 Volcanoes

10.2 Earthquakes/tsunamis

10.3 Avalanches/landslides

11 Climate change & severe weather

11.1 Habitat shifting & alteration

11.2 Droughts

11.3 Temperature extremes

11.4 Storms & flooding

11.5 Other impacts

12 Other options

12.1 Other threat

Threat Impact

For each threat, the timing of the threat (i.e. past, ongoing or future), its scope (i.e. the proportion of the total population affected) and severity (i.e. the overall declines caused by the threat) should be evaluated to calculate an impact score.

Timing options:

- Only in the past and unlikely to return
- In the past but now suspended and likely to return
- Ongoing
- Only in the future
- Unknown

Scope options:

- Affects the whole population (>90%)
- Affects the majority of the population (50-90%)
- Affects the minority of the population (<50%)
- Unknown

Severity options:

- Causing or likely to cause very rapid declines (>30% over 10 years or three generations; whichever is the longer)
- Causing or likely to cause rapid declines (20–30% over 10 years or three generations; whichever is the longer)
- Causing or likely to cause relatively slow but significant declines (<20% over 10 years or three generations; whichever is the longer)
- Causing or likely to cause fluctuations
- Causing or likely to cause negligible declines
- No declines
- Unknown

Threat Impact Scoring System (based on additive scores and defined thresholds)

Version: 1.0

a) Continuing threat

	Severity	Very rapid Score	Rapid Score	Slow Score	Negligible Score
Scope		3	2	1	0
Whole	Score 3	6	5	4	3
Majority	Score 2	5	4	3	2
Minority	Score 1	4	3	2	1
Negligible	Score 0	3	2	1	0

b) Threat may occur /return in the short term

	Severity	Very rapid Score	Rapid Score	Slow Score	Negligible Score
Scope		3	2	1	0
Whole	Score 3	6	5	4	3
Majority	Score 2	5	4	3	2
Minority	Score 1	4	3	2	1
Negligible	Score 0	3	2	1	0

c) Threat may occur/return in the long term

	Severity	Very rapid Score	Rapid Score	Slow Score	Negligible Score
Scope		3	2	1	0
Whole	Score 3	6	5	4	3
Majority	Score 2	5	4	3	2
Minority	Score 1	4	3	2	1
Negligible	Score 0	3	2	1	0

Impact Coding

- High impact
- Medium impact
- Low impact
- Negligible/ No impact

Appendix 3: Case Study

Case study 1: Conservation of Birds of Prey in Akaya Forest (HCV1)

Akaya Forest located in Minakami Town, around the border of Gunma Prefecture and Niigata Prefectures. It is a state-owned forest with the area of 10 km x 10 km (About 10,000 ha), located in the headwater of Tone River. The forest includes pristine natural forest, natural grassland, secondary forest, coniferous plantation, as well as wetlands where many rare, threatened, and endangered species inhabit. The forest also hosts nationally endangered birds of prey, Golden eagle (*Aquila chrysaetos*) and mountain hawk-eagle (*Nisaetus nipalensis*) and the beauty of the landscape has attracted many hikers.

Because Akaya Forests are not FSC certified, an HCV assessment in line with FSC requirements is has not been conducted. However, the area is highly likely to be HCV 1, 2, 3 for it rich biodiversity and pristine nature. The forests can be also HCV4, for it is also headwater of Tone River, which supply water to the Tokyo metropolitan area.

In Akaya Forest Project, Akaya Project Area Council, Japan Nature Conservation Society (NACS-J), and Kanto Forestry Bureau work together to restore biodiversity and sustain community development by involving local NPOs. The project area is divided into six zones according to their ecological and social attributes. Forests closed to settlements are managed focusing on sustainable use of forest and preservation of cultural tradition, Akaya Headwater Area, where forests have the highest naturalness, is managed with focus on conservation of mountain hawk-eagle. Based on the knowledge of the ecology of the eagle, the management plan includes following management methods:

- Natural forests and secondary forests are left to the natural succession.
- In plantations that are left unmanaged and shifting to natural vegetation, thinning or small-scale of clearing of planted trees are conducted and promote transition to natural vegetation.
- For plantations around 700 meters above sea level and those established in riparian area are considered to be suitable for nesting of mountain hawk-eagles, thinning is conducted to maintain proper density of planted trees and encourage trees to grow big and old.

The purpose of the above management method is to secure space within forests and to the forest environment suitable as a hunting grounds for young birds, as well as to secure big trees that the mountain hawk-eagle can nest.

It may be difficult to directly apply this example to small-scale private forests, as the project is for a large tract of state-owned forest with rich human and economic resources. Still, this case study presents a good example of proactive forest management for conservation of endangered species.

Case study 2: Chinese Cork Oak Forests of Asahi Breweries, Ltd. (HCV3)

Asahi Breweries, Ltd., which acquired the third FM certification in Japan in 2001, manages fifteen forests scattered in Miyoshi City and Shobara-shi of Hiroshima Prefecture. In total of 26 ha of forests are designated as HCV 3, including stand of Chinese cork oak (*Quercus variabilis*) and been forests around the top of mountains.

Figure 2 Chinese cork oak forest (HCV 3)

The company's forest stands of Chinese cork oak was established during World War II, when the supply of cork from overseas is threatened, by planting Chinese cork oak trees in the forest area where the species was naturally abundant, so the thick bark of the trees can be used as cork. After all, the oak was never utilized for cork production, and the forest stand is left to natural succession for 60 years since it was established. The forest has become a highly natural hardwood forest dominated by Chinese cork oak. Although it is a forest made by human hands, the organization designated the forest as HCV as it is nationally rare to have a forest where the Chinese cork oak occur in such high density. Also designated as HCV3 is the beech community located around the top of Mt. Mengame. The forest is a natural forest with little human disturbance, and the forest is designated as Nature Conservation Area of Hiroshima Prefecture for the rarity of beech forest in Chugoku District. The 5 ha of beech forest around the top of Mt. Nibuzaka does not have such designation by the government, but the organization has designated the stand as HCV3 after conducting investigation of the site following requests from the local people and confirming the conservation value. The entire forest area of Asahi Breweries Ltd. is designated as a water conservation forest reserve, and public benefit has been one of the important goal of the forest management from the beginning. The company has been proactive in implementing environmental education program. Since 2010, the company has delegated the biodiversity monitoring to a specialized company, which has found rare, threatened and endangered species such as the clouded salamander (*Hynobius nebulosus*), *Salvelinus leucomaenis imbrius,* and Eurasian Scops-owl (*Otus scops*). Based on such conservation activities and monitoring results, the Company developed "Asahi Forest Biodiversity Basic Policy" in 2014. Furthermore, the company invites investors, officials of the Ministry of the Environment, and experts such as university professors and researchers of the Forest Research and Management Organization to annual meetings to exchange opinions and decide the management methods. Regarding HCV, rather than banning forestry operations, the Company has developed handbook for conservation, utilization and collaboration, and has made a 3-year action plan to proactively utilize the forest resources while maintaining and improving its values. For example, in the Chinese cork oak forest that are designated as HCV3, the company makes a trial to create snags by conducting band-girdling.

Case study 3: Land of Ainu Folklore (HCV 6)

Saru River Basin of Biratori Town, Hokkaido is an “important cultural landscape” recognized by the national government as “cultural landscape of Ainu tradition and modern development”. In this area, traditional Ainu living habitats (Ioru), where Ainu peoples used to live, and places that appear in Ainu epic poetry (Yukar) are scattered in the landscape.

Mitsui & Co., Ltd. has large area of forest in this area, and it has been engaged with the local Ainu organization of the area. It obtained the map of Iorus from Biratori Town municipal government and identified three Iorus within its corporate forest to protect them as “cultural protected forests”. Through collaborative field survey with the local Ainu experts, it has identified culturally important sites, including Okikurumi and Muinoka, which are nationally designated scenic spots, “Pirka Noka.”

Figure 3 Muinoka, a site of Ainu folklore. The legend has it that the half-moon-shaped rock exposure was a winnowing basket that the wife of Okikurmi Kamuy (God) left behind when she was returning to heaven.

As an FSC FM certificate holder, the company classifies all forests based on their current condition and management purposes. Forests to be conserved are classified into protected forest, which are further divided into special protected forest, environmentally protected forest, protected forest for water and soil, and culturally protected forest. It considers that special protected forest is equivalent to HCV, but also implements appropriate management in other protected forests. For the management of culturally protected forest, it engages with a local Ainu Association.

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