Forest Stewardship Council Regional Certification Standards for British Columbia

Main Standards

Forest Stewardship Council Canada
October 2005

This standard was developed by the FSC BC Regional Initiative for Forest Stewardship Council Canada, and accredited by FSC International in October 2005.

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Introduction

To assist the reader, each occurrence of a defined term is **bolded** throughout these standards. A glossary of these terms is provided in Appendix A. Other publications referred to in the standards are listed in Appendix E.

The Geographic Area Covered by these Standards

The FSC Regional Certification Standards for B.C. are intended for application throughout the province of British Columbia, except for the portion of northern B.C. where the National Boreal Standard applies. This Boreal area is defined by the presence of the Boreal White and Black Spruce (BWBS) and the Spruce Willow Birch (SWB) **biogeoclimatic zones** (roughly the area within the Boreal, Sub-arctic and Sub-arctic Highlands ecodivisions (see glossary for **biogeoclimatic** and **ecoregional** classifications). **Forest management units** that include land covered by the B.C. Standard and the National Boreal Standard will normally be certified with the B.C. standard, unless the area outside of the boreal region is small, in which case the National Boreal Standard is used. In case of doubt the certification body should consult with FSC Canada.

British Columbia encompasses 95 million hectares or 234 million acres (the combined size of France, Germany and the Netherlands) with relatively little development. Forests, which cover about two-thirds of the province, are central to B.C.'s way of life—not only in terms of the economy and jobs, but also for recreation, drinking water, wildlife, and spiritual values.

British Columbia is a diverse province, more variable physically and biologically than any comparable region in Canada. Broadly speaking BC is a cool, moist, mountainous, forested region with areas of semi-arid, subarctic, and alpine climates. The province has been ecologically classified into 14 **biogeoclimatic zones**, based on mean annual precipitation, temperature, soils and vegetation. Forests dominate the vegetation but there are also areas of grasslands, wetlands, scrub and tundra.

Because of the wide variation described above, these standards are designed for use in any type of forest or **ecosystem** found in the province. For this reason they require site-specific interpretation by the forest **manager** and by the certification body suited to the specific ecological context of each **management unit**.

Small Operations

FSC-BC recognizes that scale and intensity of management varies from one **management unit** to another. In response to those differences there are an additional set of standards that apply to small operations in BC: *FSC Regional Certification Standards for BC – Small Operations Standards*. **Management unit**s meeting the criteria outlined below should use that document.

Small operations are defined as:

- meet the FSC-Canada definition of Small and Low Intensity Managed Forests (i.e. **SLIMFs** – **management unit**s less than 1,000 ha, OR **management unit**s that have an allowable annual cut that is <5,000m3 and less than 20% of the total mean annual increment of the productive forest area); or,
- are less than 2,000 ha. in area.

Indicators for Compliance with FSC Principles and Criteria in British Columbia

The following sections present the Indicators required of forest **manager**s for compliance with the FSC Principles and Criteria in British Columbia and Verifiers provided for use by certification bodies in verifying forest **manager**s' compliance. Verifiers are presented as examples, and may be supplemented or replaced with other appropriate Means of Verification.

Principle 1: Compliance with Laws and FSC Principles

Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

1.1 Forest management shall respect all national and local laws and administrative requirements.

Intent for Criterion 1.1:

In British Columbia, laws and regulations provided by provincial, federal and municipal governments govern forest management planning and practices. Legal requirements are in flux as governments implement new policies and legislation; during auditing certifiers need to familiarize themselves with current legal and regulatory requirements that apply to the **forest management unit**.

The best measure of "respect for all national and **local laws**" is the **manager**'s record of compliance with laws and regulations. Legal and regulatory measures governing forest management planning and practices anticipate non-compliance, but certification against these Standards demands a *good record of compliance*. These Standards require that certifiers determine what constitutes a good record of compliance by considering the following:

- Number of instances of non-compliance (there is not an established threshold for non-compliance, but in British Columbia a good record of compliance has routinely been measured as a compliance rate of greater than 95% with little or no **significant non-compliance**).
- No evidence of a pattern of recurring non-compliance.
- Evidence of corrective action including new policies implemented by the **manager** to avoid future non-compliance, mitigation of impacts associated with an act of non-compliance and the **manager**'s overall efforts to comply with laws and regulations (e.g., standard operating procedures, record keeping, worker training).

Recognizing that there is a degree of subjectivity involved in determining a good record of compliance, the Standards require certifiers to review written documentation relating to compliance and to interview government agency personnel responsible for compliance in making their determination.

1.1.1 Up-to-date copies of **applicable legislation and guidebooks** are maintained by the **manager** and made accessible to appropriate personnel. Electronic access is acceptable (see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on Applicable Legislation and Guidebooks).

1.1.2 Personnel who plan and implement management activities demonstrate knowledge of legal, regulatory and administrative requirements relevant to their responsibilities.

1.1.3 A good record of compliance with **applicable law** relating to forest management activities is demonstrated through a review of records held by **agencies responsible for enforcement or auditing of laws affecting forest management**.

1.2 All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid.

1.2.1 The **manager** pays stumpage for the full scaled volume of all logs from each cutting authority, as shown by cruise, scale and billing information maintained by **manager** and/or the provincial harvest and billing **database**, and demonstrates that all fees, royalties, taxes or other charges have been paid in a timely way in the manner prescribed by law or contract.

1.3 In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected.

1.3.1 The **manager** demonstrates respect for the spirit and intent of **binding international agreements** by:

a) maintaining copies of the agreements (electronic access is acceptable); and,

b) demonstrating familiarity and taking action consistent with those aspects of the agreements that are relevant to operations associated with the **management unit** and the FSC Guidelines on the ILO Conventions (see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on International Agreements).

1.4 Conflicts between laws, regulations and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case by case basis, by the certifiers and the involved or affected parties.

1.4.1 Situations where the **manager**'s compliance with the law would preclude compliance with the FSC-BC Regional Standards, or vice versa, are documented.

1.4.2 Where a **conflict** is found to exist, steps are taken and documented to ensure that the FSC-BC Regional Standards are met in the present and can be met in the **long term** in the **management unit**, including written evidence of necessary government approvals, designations, authorizations, or exceptions/exemptions from legal requirements. Note: Any **conflict** that cannot be resolved by the **manager**/owner and/or the certification body should be referred to FSC Canada.

1.5 Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities.

1.5.1 The **manager** has measures in place to protect the **management unit** from illegal/unauthorized activities.

Means of Verification:

1.5.1 (i) Presence of specific measures to prevent unauthorized activities (e.g., boundary notices, access controls).

1.5.1 (ii) Reporting system for illegal harvesting, settlement or other unauthorized activities.

1.5.1 (iii) Reports of such activities detected during management activities.

1.5.1 (iv) Interviews with relevant personnel, to assess their familiarity with procedures for reporting unauthorized activities.

1.6 Forest managers shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria.

1.6.1 The **manager** has made a publicly available, written commitment to adhere to the FSC-BC Regional Standards over the **long term**, which is signed off by the board of directors and/or equivalent senior authority, and included in the **management plan**.

Means of Verification:

1.6.1 (i) Membership in FSC.

1.6.1 (ii) Participation in standards development, review and improvement.

1.6.2 Full disclosure is made of all forest areas over which the **manager** has some management responsibility.

Means of Verification:

1.6.2 (i) A written strategy by the applicant to move towards managing all of its holdings in the region using a management regime that is consistent with the FSC's Principles and Criteria (e.g., grounded in similar management philosophies, ecological frameworks, and balancing of values and objectives).

Intent for 1.6.2 and 1.6.3:

FSC does not require a forest management enterprise to apply to have all of its forest operations certified, nor to agree to a timetable for such evaluation (FSC requirements on partial certification of large ownerships). It is the goal of FSC Canada to encourage certificate holders to move towards having all of their holdings FSC certified.

A **manager** can further demonstrate a long-term commitment to the FSC Principles and Criteria by meeting the FSC standard for controlled wood, i.e. not being involved in harvesting or handling wood that originates from areas where traditional or civil rights are violated; from forests where high conservation values are threatened; from genetically modified (GM) trees; from illegal harvesting or wood from areas which have been converted from **natural forest** to **plantation**s or non-forest uses (see FSC-STD-30-010).

1.6.3 The **manager's** non-FSC wood products are not from sources included in the categories outlined in FSC-STD-30-010 "FSC standards for forest **managers** supplying controlled wood".

Principle 2: Tenure and Use Rights and Responsibilities

Long-term tenure and forest use rights to the land and forest resources shall be clearly defined, documented and legally established.

2.1 Clear long-term tenure and forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be clearly demonstrated.

Intent for Criterion 2.1:

The general intent under this criteria is to specify what conditions fulfill the requirement for "clear long-term **tenure** and **use rights** to the land." Crown-granted lands (i.e. private land) and Indian Reserve Lands clearly meet that test, assuming the registered owner or the relevant **First Nation** is a party to the certification application or clearly states agreement with the management plan. Crown forests in British Columbia include various types of area-based and volume based **tenure**s. **Tenure**s can also be short-term or long-term (generally through renewal provisions). In the case of renewable area-based **tenure**s (e.g., Tree Farm License, Woodlot License, Community Forest Agreement), the **forest management unit** and associated management responsibilities are assigned to a specific geographic area, and generally extend over long periods through repeated renewals. These are deemed to meet the test of clear long-term **tenure** and forest **use rights** to the land.

In the case of renewable long-term volume-based **tenure**s (e.g., Forest License) a right to harvest a volume of timber is awarded to the licensee within a larger geographic area (Timber Supply Area); however, the licensee has no legal rights over any specific piece of land. In this case, the **manager** must be able to demonstrate that the land-owner (i.e., the Crown) is a co-applicant to the certification, or has provided assurances that the land-owner has no objection to implementation of measures consistent with the FSC-BC standards and the **manager**'s management plan, and will fully incorporate the impacts of the management plan when determining an AAC for the **management unit** for which certification is sought. In the case of short-term non-renewable licenses (e.g., Timber Sale License) , the **manager** must be able demonstrate that the landowner (i.e., the Crown) is the applicant or a co-applicant for certification, as the licensee alone has no long-term management rights over the harvesting area.

In the case of volume-based **tenure**s, and some area-based **tenure**s (e.g., TFLs with overlapping Pulpwood Agreements), where more than one **manager** may have timber harvesting rights and management responsibilities in partnership with the Crown within a defined area (e.g., a Timber Supply Area), certification of a **management unit** will require careful consideration by the certifier. In particular, long-term management requirements found in the Standards (e.g., protected reserve networks, watershed management) may call for the **manager** to seek a significant level of cooperation on the part of the Crown to ensure the **manager** can meet those requirements over the long-term. Certifiers should look for and document such assurances when auditing volume-based **tenure**s and other **tenure**s with over-lapping timber **tenure**s.

2.1.1 The **manager** has the legal right to manage the lands and to utilize the forest resources for which certification is sought, in one of the following circumstances:

a) the **manager** is named on the certificate of title for the area of land for which certification is sought and there are no reservations or charges that would constrain the **manager**'s right to manage the lands and utilize the forest resources for which certification is sought;

b) the **manager** has **customary rights** (e.g., **Aboriginal title**) to manage the land and utilize the forest resources in the **management unit**;

c) the **manager** has an area-based **tenure** or lease that is legally eligible to be renewed or replaced over a time period sufficient to achieve the long-term management objectives set out in the **management plan** (e.g., the **manager** has a Tree Farm License, Woodlot License, Community Forest Agreement);

d) the **manager** has a replaceable, volume-based **tenure** and either the Province and the **manager** jointly apply for certification, or the following requirements are met:

- at the time of initial certification, the **manager** demonstrates that efforts focused on the successful implementation of FSC-BC standards within the **management unit**, are being made with the Province and other overlapping forest **tenure** holders; and
- permits, licenses, plans or analyses issued and/or approved by the Province for the **management unit** adhere to relevant portions of FSC-BC regional standards, the **manager's management plan** and supporting operational plans, and
- timber supply analysis subsequent to initial certification provides for an AAC determination specific to the **management unit**; or

e) the **manager** has a non-replaceable license, and the application for certification has been made by the **manager** and the province or by the Province alone.

2.1.2 A legally documented description of the lands over which the **manager** has rights, and for which certification is sought, including a map, is included in the **management plan**. In the case of a volume-based **tenure**, a map showing the **manager's** chart/operating area, accompanied by written confirmation from the Province of the **manager's** rights in this area, is included.

2.1.3 Where the **manager** does not have title, the **manager** demonstrates that the owner/**Province** does not impose constraints that prevent the implementation of the FSC-BC Regional Standards or the **management plan** in the **management unit**.

2.1.4 Where **tenure** and forest **use rights** in the **management unit** are not held by a single **manager**, the management activities of other legal **tenure** holders do not undermine the achievement of **management plan** objectives or the **manager** has taken steps that mitigate for damages resulting from those activities.

Means of Verification:

2.1.4 (i) No evidence of activities of other **tenure** holders in the **management unit** that undermine the achievement of **management plan** objectives.

2.1.4 (ii) The **manager** has taken steps to mitigate damages resulting from such activities that may undermine the **management plan** objectives..

2.1.4 (iii) Mitigation measures result in no net loss to value affected.

2.2 Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.

2.2.1 In consultation with **local** people, the **manager** identifies, documents and, where appropriate, maps any **legal or customary tenure or use rights** in the **management unit** held by one or more people who reside within or adjacent to it.

2.2.2 The **manager**:

a) obtains **free and informed consent from local rights holders** to any portion of the **management plan** that affects their rights and resources; and,

b) if **local rights holder**s **dispute** that current or proposed management protects their rights and resources, the **manager** implements recommendations developed through a Criterion 2.3 **dispute** resolution process that protect their rights and resources, to the extent that these rights are consistent with the FSC-BC Regional Standards.

2.3 Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

Intent for Criterion 2.3:

The Indicators associated with this Criterion apply to a discrete set of circumstances. The certifier should pay close attention to the definitions provided in the glossary pertaining to the terms **disputes**, outstanding **dispute**, **local rights holders**, **local**, **customary rights** and **First Nation**s. These definitions are intended to clarify the scope of what is intended by **disputes** as they apply to **tenure** claims and **use rights**.

The certifier should pay particular attention to the efforts of all parties to resolve **disputes**, keeping in mind that **dispute** resolution requires the good faith efforts of all parties in order to succeed. The certifier should take into account circumstances where there is evidence that the **manager** has made a sustained effort to resolve a **dispute**, but other parties to the **dispute** have not responded to the opportunity provided.

In these Standards the term "**disputes** of substantial magnitude" is defined by the list items associated with Indicator 2.3.3.

2.3.1 The **manager** and the disputant(s) develop and implement a mutually agreed-to process to address **disputes** related to **tenure** claims and **use rights**.

2.3.2 To assist the mandatory consideration of **disputes** in the certification assessment of Criterion 2.3, the **manager** maintains a record of **disputes** and the status of their resolution, including evidence related to the **dispute** (whether generated internally, from outside experts or provided by disputants), and documentation of steps taken to resolve the **dispute**.

2.3.3 The **manager** is not involved in outstanding **disputes** of substantial magnitude involving a significant number of interests in relation to the **management unit**. The magnitude and extent depend on various factors including the following:

a) whether the **dispute** involves **local rights holder**s, **local forest workers**, or **local** residents;

b) whether the **dispute** involves the legal or **customary rights** of **First Nation**s;

c) the range of issues and/or interests involved;

d) whether the potential impacts on the disputant(s) are irreversible or cannot be mitigated; and /or

e) whether the **dispute** involves issues related to meeting the FSC-BC Regional Standards.

Principle 3: Indigenous Peoples' Rights

The legal and customary rights of indigenous peoples to own, use and manage their lands, territories and resources shall be recognised and respected.

3.1 Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.

Intent for Criterion 3.1:

The Standards direct the certifier to assess the relationship between the **manager** and the relevant First Nation(s). This relationship forms the basis for addressing the requirement of Criterion 3.1 relating to "**free and informed consent**." The relationship should clearly demonstrate whether the **manager recognizes and respects** the customary and legal rights of First Nations over their lands, territories and resources. See the glossary for a definition of lands, territories and resources.

While the Constitution and case law affirm **Aboriginal Rights** and Title, the lands, territories and resources to which rights and title are associated overlap with Crown ownership and the rights of Crown **tenure** holders. The process of determining where **Aboriginal Rights** and Title apply is a matter of negotiation between the Crown and First Nations (e.g., Treaty Process) and the outcome of litigation. A Crown **tenure** holder—for the purpose of these Standards the **manager**—has a different role from that of the Crown in relation to a demonstration of respect and recognition for **Aboriginal Rights** and Title.

These Standards do not address the relationship between First Nations and the Crown, but that between the **manager** and relevant First Nations. The Standards define the relationship between the **manager** and First Nations in terms of respect and recognition, and the interplay between consent and control as related to the management plan and operations on the **management unit**. The Standards set out a number of ways the existence of these elements can be determined. The tests in this case, are not a measure of the *degree* of respect and recognition, but whether all of these elements are apparent in the relationship, along with the effort made by the **manager** to consult with and accommodate the interests of relevant First Nations.

During an assessment certifiers need to take into account the following:

- Agreements between the relevant First Nation(s) and the **manager** that address the requirements of the Standards may be in writing or otherwise apparent. It can be anticipated that the exact form of an agreement, formal or informal, will vary depending on circumstances and the decision-making practices of individual First Nations.
- If during an assessment it is determined that, notwithstanding the efforts of the **manager**, relevant First Nation(s) have decided not to participate in measures that address the requirements of the Standards, this circumstance should be evaluated and taken into consideration by the certifier. The certifier should clearly distinguish between cases where the First Nation(s) are not participating because of dissatisfaction with management activities on the **management unit** or the **manager**, and a lack of interest or capacity to participate.
- Under no circumstances should certification proceed in the face of dissatisfaction of the affected First Nation(s) regarding management activities within the Management Unit.
- The ability of relevant First Nation(s) to participate in measures that address the requirements of the Standards may be limited by the availability of human and financial resources (capacity). Where this circumstance arises the certifier will evaluate the situation on a case-by-case basis including steps taken by the **manager** and/or First Nation(s) to mitigate the situation.

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Intent for Criterion 3.1 (cont'd):

- Claims to traditional territory made by more than one First Nation occasionally overlap geographically. In some cases overlapping claims are subject to protocol agreements or similar mechanisms between the relevant First Nations, while in others the overlap remains an open question. Where an overlapping claim occurs, it is beyond the ability of the **manager** to adjudicate or otherwise resolve this issue. Certifiers will have to consider this circumstance when it arises on a case-by-case basis, looking for agreements between relevant First Nations and efforts made by the **manager** in response to the circumstance.
- Where the land and/or traditional territories of more than one First Nation (i.e., discrete from overlapping claims) fall within the **management unit** being certified, the certifier will, as directed by the Standards, assess the relationship between the **manager** and each First Nation.

Application of the Standards are without prejudice to treaty, land claims settlements, or agreements First Nations may reach with government. The Standards shall not be construed as an acceptance of Provincial Crown title or extinguishment of **Aboriginal title**. The Standards do not derogate from the **Aboriginal rights** of First Nations.

Indicators of Recognition and Respect

3.1.1 The **manager recognizes and respects** the legal and **customary rights** of the **First Nation**(s) over their lands, territories and resources.

Means of Verification:

3.1.1 (i) **First Nation**(s) formally indicate clearly and unambiguously, either verbally or in writing, that their legal and **customary rights** over their lands, territories and resources have been **recognized and respected**.

3.1.1 (ii) **First Nation**(s) interests or concerns are clearly incorporated in the **management plan**.

3.1.2 If requested by a relevant **First Nation**(s), a protocol agreement(s) has been reached that provides for the nature of the relationship between the parties, including:

a) How the parties will establish and conduct their relationship;

b) The roles and responsibilities of the parties;

c) The interests of the parties;

d) A description of appropriate decision-making authorities for all parties; and,

e) Provides the framework for subsequent agreements necessary to give effect to the protocol.

3.1.3 Where a **dispute** arises the **manager** makes available an effective and fair resolution process to address the **dispute** as outlined under Criterion 4.5.

Indicators of Consent and Control

3.1.4 The **manager** has obtained **free and informed consent**, normally in writing, for the **management plan** from the appropriate **First Nation**(s) after either:

a) jointly developing the plan according to the process set out in a **joint management agreement**, or,

b) **consulting with the First Nation**(s) on the plan.

Means of Verification:

3.1.4 (i) Evidence of oral or written consent.

3.1.4 (ii) The relevant **First Nation** has the financial, technical and logistical capacity to enable them to participate on an informed basis in planning and decision-making.

3.1.5 Conditions under which consent has been given and under which it might be withdrawn, if any, are recorded in the **management plan**.

3.1.6 Where more than one **First Nation** is affected by the area being proposed for forestry activities, consent from each is ordinarily required.

Means of Verification:

3.1.6 (i) The **manager** has contacted all relevant **First Nation**(s).

3.1.6 (ii) Evidence of written or oral consent.

3.1.6 (iii) Where there are adjacent or overlapping areas, or shared territories, the **manager** has an ongoing relationship, based on mutual respect, with those **First Nation**s(s) that have close ties to the area of the **management unit** (e.g., **First Nation**s' communities within close proximity, have present activities within the **management unit**, have historical occupancy, traditional uses or traditional place names within the **management unit**, etc.).

3.2 Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples.

3.2.1 **Forest management** activities within the **management unit** are planned and implemented in such a way as to maintain the **resources and tenure rights** of the **First Nation(s)**, except in the following circumstances:

a) the **First Nation(s)** are satisfied with measures to offset the loss or diminishment (e.g., restoration, replacement, monetary compensation, or other consideration); or,

b) the **First Nation(s)** agree to accept the loss or diminishment.

3.3 Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognised and protected by forest managers.

3.3.1 **Forest management** activities within the **management unit** are planned and implemented in such a way as to protect **sites of special cultural, ecological, economic, or religious significance** to the **First Nation(s)** except in the following circumstances:

a) the **First Nation(s)** are satisfied with measures to offset the loss or diminishment (e.g., restoration, replacement, monetary compensation, or other consideration); or,

b) the **First Nation(s)** agree to accept the loss or diminishment.

3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence.

3.4.1 Where mutually agreed, the **manager** incorporates **First Nation(s) traditional knowledge** into the **management plan** and supporting operational plans and practices.

3.4.2 Parties have reached agreement on fair compensation where the **manager** has made use of the **First Nation(s) traditional knowledge.**

Principle 4: Community Relations and Worker's Rights

Forest management operations shall maintain or enhance the long-term social and economic well being of forest workers and local communities.

Intent for Principle 4:

The applicant should be a responsible corporate citizen and ensure **forest worker**s on the **management unit** are treated fairly, with respect and dignity, and use their influence to persuade contractors, subcontractors and over-lapping license holders to do the same. Responsible corporate citizenship for the purposes of Principle 4 is interpreted as:

- ensuring that local communities receive an equitable share of economic and social benefits from the extraction and processing of forest products from the **management unit**,
- ensuring that those adversely affected by management activities on the **management unit** are treated fairly; and,
- consulting with local and/or affected communities and the public (see glossary definition of "**directly affected persons**" and intent for Criterion 4.4. below), regarding their concerns with management activities on the **management unit**, and accommodating those concerns.

While consultation and consent from First Nations is expected to be a distinct process from public participation under Principle 4, this Principle otherwise applies equally to Indigenous communities and its interpretation should take into account issues that are often especially relevant in Indigenous communities, such as a shortage of capacity and resources.

Local communities and **forest worker**s should be interpreted based on the definitions of "**local**," "**forest worker**" and "**employee**" supplied in the FSC-BC glossary. Under this Principle, some indicators are directed towards the **employees** of the applicant, whereas others are directed at **forest worker**s. Note that "**forest worker**" is a more comprehensive term than is "**employee**". **Forest worker**s include the **employees** of contractors, overlapping or third-party licensees, as well as **employees** of the applicant or applicant entity. Both union and non-union workers are included. The requirements that can be applied to a contractor or overlapping or third-party license holder are somewhat limited by legal requirements, but in some cases, such as provision of disability and accident insurance, the applicant is required to remedy any deficiencies that may be present in the terms of employment offered by contractors and third-party licensees.

The **manager**'s policies to encourage local hiring should include benchmarks (e.g., local **employees** as a percentage of total **employees**, today and x years from now), and measures within the **manager**'s control to address potential barriers to employment on the **management unit** for groups currently underrepresented in the workforce, where this is identified as an issue through consultation.

It is recognized that sources of all goods and services may not presently be available locally, but the **manager** is expected to demonstrate that concrete steps are being taken to increase the amount of goods and services obtained locally; for example:

- setting the date, location, terms and specifications for bidding so that local suppliers and contractors may readily bid;
- giving local suppliers/businesses a right of first refusal on contracts for the supply of goods and services;
- eliminating corporate policies that preclude the use of local suppliers of goods and services;
- working with local suppliers to facilitate mutually beneficial solutions where obstacles exist to obtaining goods and services locally.

4.1 The communities within, or adjacent to, the forest management area should be given the opportunity for employment, training and other services.

Employment

4.1.1 **Local forest workers** are employed on the **management unit**.

Means of Verification:

4.1.1 (i) Written policies that encourage **local** hiring and evidence that such policies are being implemented.

4.1.1 (ii) **Local forest worker**s as percentage of total **forest worker**s.

4.1.1 (iii) Percentage of contracted activities captured by **local** companies or individuals.

4.1.2 Wages and benefits paid to **forest workers** are consistent with regional BC industry average.

Means of Verification:

4.1.2 (i) **Manager**'s and contractor's records relating to wages paid and benefits provided to **forest worker**s.

4.1.2 (ii) BC industry averages from BC Statistics.

4.1.3 The **manager** requires contractors to adhere to portions of the FSC-BC Regional Standards relevant to their activities on the **management unit**.

Training

4.1.4 The **manager** and contractors provide training opportunities and/or collaborate with **local** training providers and institutions, such that:

a) **local** people receive enhanced employment qualifications;

b) **forest workers** receive the training needed to comply with the FSC-BC Regional Standards and legal requirements applicable to their responsibilities; and,

c) **employees** receive skills upgrading to facilitate advancement within the **manager**'s operations**.**

Means of Verification:

4.1.4 (i) A documented skills development, training and professional development policy and program.

4.1.4 (ii) Interviews with **forest worker**s, union officers, contractors, **First Nations**, **local** community members and any institutions providing skills upgrading in the area.

4.1.5 The **manager** assists displaced **employees** to make the transition to new work (e.g., providing as much notice as possible; planning, job search and counseling assistance).

Goods and Services

4.1.6 The **manager** utilizes **local** goods and services.

Means of Verification:

4.1.6 (i) Policies and processes related to **local** procurement.

4.1.6 (ii) Tender notices.

4.1.6 (iii) Evidence of **local** procurement (e.g., contracts with **local** suppliers, lists of purchases).

4.2 Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families.

4.2.1 The **manager** develops and implements a safety program (for all **forest worker**s) to meet or exceed occupational health and safety regulations. The program includes:

a) assessing new forest practices for hazards and developing/communicating appropriate safety measures in relation to them, and

b) ensuring that **forest workers** are informed about potential health and safety risks, including provision of full information about the right to refuse work and the contents of **chemicals** used.

Means of Verification:

4.2.1 (i) Interviews with **forest worker**s, and union officers.

4.2.2 The **manager**'s operations have a consistently low accident frequency rate.

Means of Verification:

4.2.2 (i) Workers Compensation Board records and confidential **forest worker** interviews verify the accident history on the **management unit** (**manager**'s and contractor's).

4.2.2 (ii) **Forest worker** interviews indicate that the **manager**'s safety program enhances worker safety and is implemented consistently and fairly.

4.3 The rights of workers to organize and voluntarily negotiate with their employers shall be guaranteed as outlined in conventions '87 and '98 of the International Labour Organization.

4.3.1 The **manager**'s actions demonstrate support for the rights of **forest workers** to organize and voluntarily negotiate collective agreements. The **manager** adheres to labour/employment and human rights practices that protect **forest workers** from discrimination or harassment (e.g. , whistle blower protection, etc.).

Means of Verification:

4.3.1 (i) Interviews with **forest worker**s, human resources officials, union officers, and review of Labour Relations Board records.

4.3.2 **Managers**/contractors comply with applicable labour laws and collective agreements.

Means of Verification:

4.3.2 (i): Labour relations board/grievance records, and interviews with **forest worker**s and union officers.

4.4 Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups (both men and women) directly affected by management operations.

Intent for Criterion 4.4:

In British Columbia 95% of the commercial forest is publicly (Crown) owned, and private forest ownership, where it occurs, usually encompasses values important to the public. This means that the public has an interest in the management of forestland and that forest management benefits from public involvement because:

- People have a right to be meaningfully involved in decisions affecting them, especially when those activities are being carried out on publicly owned (Crown) lands;
- Interested and affected parties have knowledge and expertise – especially pertaining to local conditions – that can help improve the plan and the resulting forestry operations; and,
- Forest management planning that is adequately informed by the views of affected people is more likely to be politically acceptable and socially beneficial to affected communities.

The public participation requirements in the Standards are based on an understanding of the foregoing, recognizing the role the public plays in forest management. Special emphasis is placed on the interest of **directly affected persons** as defined in the Standards Glossary; however, certifiers should also take into account the interest of the broader public during assessments, giving consideration to the views of women and men. The public participation requirements in this standard are intended to supplement rather than supercede the other requirements in this standard.

4.4.1 The **manager** develops and implements a **plan for ongoing public participation** that accommodates the needs and preferences of **directly affected persons** in relation to the process**.**

4.4.2 **Directly affected persons** are provided with information used in making management decisions in a manner that allows them to understand potential impacts on their rights or interests, including reasonable technical or expert interpretation as required.

4.4.3 Consistent with the FSC-BC Regional Standards, steps to protect the rights or interests of **directly affected persons** are developed and agreed to through the public participation process, and implemented by the **manager**.

4.4.4 Where the **manager** and **directly affected persons** fail to reach agreement through the public participation process, a mutually agreed-to **dispute** resolution process is used as outlined under Criterion 4.5.

4.5 Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage.

Intent for Criterion 4.5:

The Standards direct the certifier to evaluate the performance of the **manager** in relation to the rights, property, resources and livelihoods of local people who may be affected by the **manager**'s activities on the **management unit**. In the British Columbia context, this may encompass activities of local people such as trapping, tourism, recreation, access, use of **non-timber forest products**, livestock grazing, etc. It may also include the integrity of adjacent or nearby property, water **use rights** and amenities such as viewscapes, etc.

4.5.1 Grievances involving potential loss or damage related to the **manager's** forestry activities are resolved through a process mutually agreed to by the **manager** and the **grievor**(s).

Means of Verification:

4.5.1 (i) **Manager**'s records of grievances

4.5.2 (ii) Interviews with **local** people.

4.5.2 Where a **local** person or people have provided the **manager** with a **grievance notice**, the **manager** takes actions to resolve the grievance, for example:

a) in the case of a **grievance involving potential loss or damage** related to the **manager**'s forestry activities, the **manager** refrains from carrying out the activity(ies) until: a) the **manager** satisfies the **grievor**(s) that the activity(ies) will not cause loss or damage; or, b) effective measures are in place to protect the **grievor**(s) from the potential loss or damage set out in the **grievance notice**; or,

b) in the case of a grievance based on evidence that the **manager** is responsible for actual loss or damage affecting the **grievor**(s)' rights, property, resources or livelihoods, the **manager** provides the compensation (e.g., financial payment, restoration), if any, required to place the **grievor**(s) in the position that they would have been but for the activities of the **manager**, as agreed to by the parties or determined through arbitration.

4.5.3 The **manager** documents steps taken to resolve grievances, including evidence related to proof of loss or damage and amount of compensation, whether generated internally, or provided by outside experts or the **grievor**s.

4.5.4 Where a grievance results in arbitration, the costs of arbitration payable by the parties are determined by mutual agreement or, failing agreement, by the arbitrator(s), on the basis of the facts of the case, including the good faith of the parties and the parties' ability to pay.

4.5.5 Where it is determined, either by agreement or arbitration, that the **manager** is responsible for loss or damage to a **grievor**(s)' rights, property, resources or livelihood, the **manager** has measures in place to protect the **grievor**(s) from future loss or damage due to the **manager**'s activities.

Principle 5: Benefits from the Forest

Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.

5.1.1 The **management plan** and supporting operational plans describe activities in sufficient detail to enable costs of implementation to be credibly estimated.

5.1.2 The **manager**'s ability to implement the **management plan**, including investments necessary to maintain the ecological productivity of the forest and provisions to manage for other forest values, is confirmed by business plans and other relevant documents.

5.1.3 The **management plan** and/or supporting documents include information (quantitative when available) that demonstrate how environmental costs (e.g., greenhouse gases, waste disposal, noise pollution) and social costs (i.e., identified through **local** assessments and public consultation) associated with management activities have been considered. The documentation also includes information on what measures have been taken to offset, reduce or eliminate such costs.

5.1.4 When making investment and operational decisions, the **manager** sets benchmarks for reducing social and environmental costs over time and meets these benchmarks.

5.2 Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.

Local processing

5.2.1 The **manager** makes available a diversity of forest products from the **management unit** to **local** processors, at prevailing market rates, or at prices that cover the **manager**'s opportunity costs.

Means of Verification:

5.2.1 (i) Interviews with **local** processors regarding opportunities the **manager** provides them for enhancing their business.

Optimal use

5.2.2 Without **high grading**, the **manager** captures the optimal value of forest products throughout the production cycle (e.g., planning, harvesting, stand management, sorting, merchandising).

Means of Verification:

5.2.2 (i) Forest product sales records.

5.2.2 (ii) Interviews with value-added processors and competitive log markets in the area.

5.2.2 (iii) **Management plan** objectives related to optimizing value of forest products.

5.2.3 The **manager** evaluates different options for enhancing the optimal use of forest products from the **management unit** and implements measures to achieve optimal use.

5.3 Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.

5.3.1 The **manager** takes measures to minimize wood waste. The minimization of waste does not interfere with the requirements for **coarse woody debris** and snags as set out under Indicator 6.3.8.

5.3.2 While felling, skidding/yarding, bucking, sorting and handling, the **manager** takes steps to avoid breakage and damage while optimizing log utilization, grade and value.

5.3.3 While harvesting forest products, the **manager** takes steps to avoid damage to the residual stand, other **ecosystem** components, and special features.

5.4 Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product.

5.4.1 A diversity of timber and **non-timber forest products**, compatible with site conditions and **local** economic objectives for strengthening and diversifying the **local** economy over time, are produced at present, and predicted to continue under **management plan** forecasts.

Means of Verification:

5.4.1 (i) Interviews with forest-dependent businesses and **local** people regarding the **manager**'s record of adjusting forest management practices to accommodate strengthening and diversifying the **management unit**'s contribution to the **local** economy from non-timber forest uses, fish and wildlife.

5.4.2 In response to interest from the **local** community, the **manager** evaluates existing and potential production of **non-timber forest products** within the **management unit**, and identifies and implements **forest management** practices that produce a diversity of **non-timber forest products** compatible with site conditions and **local** objectives for strengthening and diversifying the **local** economy over time.

Means of Verification:

5.4.2 (i) Documentation of changes in forest management practices that are consistent with strengthening and diversifying the **management unit**'s contribution to the **local** economy from **non-timber forest products**.

5.4.2 (ii) Interviews with **local** timber and **non-timber forest product** companies regarding cooperation by the **manager** in economic diversification.

5.5 Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.

5.5.1 The **manager** identifies **ecosystem services** provided by the **management unit**, drawing on existing information (e.g., relevant assessments, inventories, studies) and public consultation as applicable.

5.5.2 The **manager** assesses and describes existing and potential impacts of **forest management** activities on **ecosystem services**.

5.5.3 The **manager** identifies and implements measures required to maintain or enhance the range of **ecosystem services** provided by the **management unit**.

Means of Verification:

5.5.3 (i) Interviews with **local** people regarding whether **ecosystem services** have been adequately maintained.

5.6 The rate of harvest of forest products shall not exceed levels which can be permanently sustained.

Intent of Criterion 5.6:

In British Columbia, the allowable annual cut (AAC) for Crown forest **tenure**s are determined by the provincial Chief Forester, and generally revisited every five years. Timber supply analyses are completed by **tenure** holders (i.e. the **manager**s) according to BC Ministry of Forests' specifications, and then submitted to the Chief Forester for determination of an AAC. The Chief Forester's determination is based on a number of factors, as defined in provincial legislation and policy (including information on standing timber inventories, site productivity, timber availability, current management practices, potential losses due to fire, insects or disease, as well as social and economic considerations).

AAC determinations for area-based Crown **tenure**s are for specific **management unit**s (e.g. Tree Farm Licenses), and are generally compatible with the approach outlined in Indicator 5.6.1. For volume-based **tenure**s in BC, AACs are determined for individual Timber Supply Areas (TSAs) which normally include a number of licenses. An application for FSC certification based on a single volume-based license that constitutes only a portion of a TSA would normally require a separate timber supply analysis that specifically addresses the land area for which certification is being sought (i.e. only a portion of a TSA). However, assumptions about management practices for the FSC **management unit** within the Ministry of Forests' TSA timber supply review process should also be consistent with the FSC management plan for that area. AAC calculations for private lands seeking certification should also be completed in a manner that meets the requirements of Criterion 5.6.

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Intent for Criterion 5.6 (cont'd):

The intent of Criterion 5.6 is to ensure that the process of timber supply analysis and AAC determination is thorough and accurate, and adequately addresses limitations on timber harvesting that may result from non-timber objectives, including social, economic, environmental and high conservation value objectives that are consistent with the FSC-BC Standards. The intent in Criterion 5.6 is also to ensure that present annual levels of timber harvest do not exceed levels that are sustainable over the long-term.

5.6.1 The rate of timber harvest for the **management unit** is based on a documented and comprehensive analysis, incorporating the following:

a) the management objectives and strategies for the full range of forest resources as set out in the **management plan**, including those for restoration;

b) practices employed to implement the strategies and operational approaches in the **management plan**, including those for restoration;

c) up-to-date inventories and the best available growth-and-yield data and projections;

d) land base reductions to account for areas that are reserved or unavailable for harvest due to economic or operational limitations;

e) volume reductions to account for stand level retention and recruitment for **ecosystem** components such as snags, wildlife trees and **coarse woody debris**;

f) non-recoverable losses such as those resulting from fires, insects and disease; and,

g) reductions required to protect non-timber values and forest-dependent economic activities.

5.6.2 The rate of timber harvest is determined in a manner that adequately reflects reliability and uncertainty associated with inventory data, management assumptions, growth-and-yield projections, and analysis methodologies.

Mean of Verification:

5.6.2 (i) Sensitivity analyses are undertaken to examine the potential timber supply impacts of uncertainties in data, growth projections and management assumptions

5.6.2 (ii) Where sensitivity analysis indicates potentially significant impacts on timber supply, an adequate margin of safety is included when setting the rate of harvest.

5.6.3 Where the **manager** harvests or has the ability to control the harvest of **non-timber forest products**, the **manager** assures that the rate of harvest reflects the best available inventory and productivity data, provides for sustainable production, and is adjusted when monitoring indicates over-harvesting.

5.6.4 The **manager** demonstrates that the average of the present and projected annual timber harvests over the next decade, and averages of projected timber harvests over all subsequent decades, do not exceed the projected long-term harvest rate, while meeting the FSC-BC Regional Standards over the **long term**.

5.6.5 After ten years of FSC certification, the **manager** demonstrates that the decadal averages of actual timber harvests in decades subsequent to FSC certification have not exceeded the projected long-term harvest rate. (Note: This indicator only applies in a Recertification)

5.6.6 Actual rate of timber harvest in any given year is no more than 25% above the projected long-term harvest rate, unless:

a) the **manager** has harvested an equivalent amount below the projected long-term harvest level within the last ten years and subsequent to FSC certification;

b) the **management unit** has a long-term annual harvest level less than 10,000 m3; or,

c) the **manager** can demonstrate that an elevated harvest rate is planned to address catastrophic events within the **management unit** (e.g. – fire, insects,) and that the 5 year average cut does not exceed the projected **long term** harvest level. Such a temporary increase in the actual rate of timber harvest takes place only after public consultation specific to the increase has taken place and the **manager** has addressed the related interests of **directly affected persons**.

Principle 6: Environmental Impacts

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

6.1 Assessment of environmental impacts shall be completed - appropriate to the scale, intensity of forest management and the uniqueness of the affected resources - and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.

Inventory

*(*see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC)*

6.1.1 Based on the best available information, the **manager** assembles relevant inventory data to establish the regional and **landscape level** context for environmental impact assessment (see *FSC BC Guidance*), including at a minimum:

a) **biogeoclimatic ecosystem classification (BEC)** mapping to the **variant** level for all **ecosections** which occur within the **management unit**;

b) percentage of Protected Areas by BEC **variant** and **ecosection** for the BEC units and **ecosections** that occur within the **management unit** (to a level below BEC **variant** where available); and,

c) extent and intensity of land use in surrounding portions of relevant BEC **variant**s and **ecosections**.

6.1.2 The **manager** collects and/or assembles reconnaissance level inventory information appropriate for **landscape level** planning and completion of a **management plan** for the **management unit** as a whole, including at a minimum:

a) **natural disturbance regime**;

b) list of potentially occurring **native species** (including at a minimum indicator plants, **focal species**, and other species of concern); and,

c) mapping of forest cover, BEC units to the **variant** level, hydrologic features, reconnaissance **terrain stability mapping**, cultural features, visual sensitivity, land use and other **tenure**s.

6.1.3 As part of the operational management planning process for landscapes and/or watersheds in which road-building or timber harvesting is proposed over the next five years, inventories, assessments and/or information **databases** of **ecosystem** characteristics, resources and environmental values are completed and/or assembled (see *FSC BC Guidance* on Inventory for further information). The inventory information should include information covering the following topics at a minimum:

a) terrain and **soil conservation hazard** mapping;

b) forest cover;

c) ecological classification to a level below the BEC **variant** (e.g., **site series** PEM/TEM), where required for habitat assessments for **focal species** or other species of concern;

d) distribution of seral stages and patch sizes, including non-forest types;

e) watershed condition, including **hydrologic features** present and specific indicators of hydrologic risk (e.g., **channel assessments,** present and projected **equivalent clearcut area - ECA**, extent of human-induced riparian disturbance, road density);

f) biodiversity information including **focal species** and their habitats; and

g) where access-sensitive species or their habitats are present (e.g., grizzly bears, ungulate winter range), assessments to determine measures for the protection of those species and habitats.

6.1.4 In areas proposed for road construction, timber harvesting, and/or other treatments that will likely affect water quality (e.g., fertilization) or stream channel integrity, detailed maps of **hydrologic features**, including **riparian classification**, are completed in advance of initiating management activities. The maps include identification of fish-bearing streams and domestic and irrigation water sources.

6.1.5 Where road construction or timber harvesting is proposed for areas rated with a moderate or high **likelihood of landslides**, areas rated as high or very high erosion potential, areas upslope of such hazardous areas (i.e. "gentle over steep"), or recharge areas for springs with domestic or irrigation water users; **detailed terrain assessments** and/or detailed **hydrologic assessment**s are completed to assess the risks to the environment and provide recommendations on mitigation or other measures to reduce risk (e.g., drainage plans).

6.1.6 In areas proposed for timber harvesting, prior to preparing stand level prescriptions and selecting harvesting methods, inventories at the cutblock or stand level are completed, including at a minimum:

a) stand structure, including occurrence of **live wildlife tree**s and snags, and relative amounts of **coarse woody debris** ;

b) presence of **aquatic habitats**, rare **ecosystem** features and/or other **critical habitat**s identified at the site level; and,

c) basic **ecosystem** and soil information.

Risk/Impact Assessments

*(*see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC)*

6.1.7 Based on the best available information, the **manager** prepares a written description of the estimated **range of natural variability** including reference to **ecosystem** conditions and **ecosystem functioning** (see *FSC BC Guidance* – Guidance on **RONV**). This description serves as an environmental base case (i.e. benchmark or reference **ecosystem** conditions) against which to measure potential environmental changes or impacts resulting from proposed management activities.

Means of Verification:

6.1.7 (i) Documentation of the methodology, assumptions and information used to define the **range of natural variability**.

6.1.7 (ii) Updates to the **range of natural variability** description as new information becomes available.

6.1.8 As part of the management planning process, an **environmental risk assessment** is completed, by comparing present and projected **ecosystem** conditions on the **management unit** to the **range of natural variability** (i.e.. "natural"). Increasing risk is defined as increasing deviation from natural. The risk assessment is **appropriate to the scale and intensity** of management activities, and the sensitivity of the affected **ecosystems. (**See *FSC BC Guidance* - Guidance on **RONV** and Risk Assessment**)**.

Inventory and Assessments Guide Management

6.1.9 The **manager** demonstrates that management planning and operational implementation are based on inventory information and the results of **terrain stability mapping**, **soil conservation hazard** assessments, **hydrologic assessment**s, habitat assessments and access-sensitive species assessments

6.1.10 Where an assessment completed under Indicator 6.1.8 indicates that environmental impacts of proposed management activities pose significant risk to biodiversity or other environmental values, then:

a) management activities do not occur; or,

b) the **manager** reduces the risk to a level comparable to that under **RONV** by employing an alternative management approach and/or mitigation measures; or,

c) the **manager** provides a written rationale that includes evidence the chosen option will not compromise **ecosystem integrity** in the broader context.

6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g. nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.

6.2.1 Habitats of red- and blue-listed species and plant communities (as defined by the BC Conservation Data Centre) and **threatened species** and **endangered species**, and species of special concern (as defined by the Committee on the Status of Endangered Wildlife in Canada) within a **management unit** are identified by field surveys or other means, and delineated on maps, subject to confidentiality requirements (see 7.4.1).

6.2.2 Where there are existing or potential habitats of red-listed, blue-listed, **endangered** or **threatened species**, or species of special concern, or red- or blue-listed plant communities present on the **management unit**, the **manager** demonstrates measures are in place on the **management unit** to minimize risk to the long-term persistence of those species and/or plant communities, by:

a) protecting those habitats and/or plant communities by including them in the protected reserve network;

b) avoiding habitat alteration that may result in increased risk to those species' and/or plant communities' long-term persistence; and/or,

c) where necessary, restoring those habitats and/or plant communities to a suitable condition.

Means of Verification:

6.2.2(i) Where population information is available, it demonstrates that the population levels of applicable species have not decreased or failed to increase, due to the **manager**'s activities within the **management unit**.

6.2.2(ii) Where habitat modeling for applicable species has been undertaken, it shows that proposed future management activities are not expected to contribute to increased risk to the species or limit recovery options.

6.2.3 Where a government recovery plan or species **management plan** has been prepared for a red- or blue-listed, **threatened** or **endangered species**, species of special concern or red- or blue-listed plant community whose habitat occurs within a **management unit**, the **manager** is implementing the recovery or species **management plan**. While recovery or species **management plans** are under development, the **manager** takes steps that are within his or her control to facilitate survival and recovery of the species or plant community.

6.2.4 The **manager** has training programs, standard operating procedures and/or protocols that specify measures for dealing with unexpected encounters with red- and blue-listed, **threatened** and **endangered species**, and species of special concern, or their habitats during operational activities. Field staff are aware of these measures. When these species or habitats are encountered, prompt notification is made to personnel who are capable of implementing prescriptions and practices designed to protect and promote the survival and recovery of the species, and these practices are implemented.

6.2.5 The **manager** cooperates with the government authorities to prevent the harming, harassing, capturing or taking of red- or blue-listed species, threatened or **endangered species**, or species of special concern within the **management unit**.

6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:

a) Forest regeneration and succession.

b) Genetic, species, and ecosystem diversity.

c) Natural cycles that affect the productivity of the forest ecosystem.

Intent for Criterion 6.3:

6.3 covers a wide range of different elements, with the broad intention of maintaining and restoring attributes, patterns and processes at multiple scales. Stand and landscape level scales are dealt with separately within the indicators, but the criteria is intended to provide an interwoven multi-scaled approach to management. The fundamental approach throughout is to use the range of natural

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Intent for Criterion 6.3 (cont'd):

variability (**RONV**) as the benchmark against which to guide or assess management targets (using information developed through 6.1.2 and 6.1.7, see *FSC BC Guidance* - Guidance on Applying **RONV** to Forest Management).

Key to this is an analysis of whether current and proposed future states are '**compatible with RONV**', which entails being within **RONV**, moving towards **RONV**, or providing evidence that functions and values are being maintained now and into the future.

Within 6.3, areas of focus are separated into Regeneration and **Succession**, Genetic, Species and Ecosystem Diversity, and Productivity.

Stand and landscape level characteristics are dealt with primarily but not solely in the 'Diversity' section:

6.3.1 asks for an assessment of restoration requirements, and requires development of prescriptions for restoring attributes. This indicator applies at all scales, as required by the current condition of the **management unit**.

Indicators 6.3.2 to 6.3.6 focus on regeneration, maintaining tree diversity during regeneration treatments, site preparation and the maintenance of early seral herb and shrub communities in relation to **RONV**.

6.3.7 and 6.3.8 ask for an assessment of the current and predicted future extent to which management results in stand types and stand level attributes that are compatible with **RONV**. Stand level attributes are the focus, but both stand and landscape level scales are refereed to, which captures the concept that these values vary at different scales; stand level averages may have more or less variability in different landscapes. In addition to considering **RONV**, minimum levels for retention are specified in 6.3.9, and are required because a) management never fully mimics natural disturbance and typically results in considerably higher removal of biomass from the site than do most natural disturbances and b) natural disturbance typically do not cease with the onset of management so harvesting is often in addition to continuing natural disturbances rather than replacing natural events.

6.3.10 focuses on landscape level parameters of seral stage distribution and patch size to ensure they are and remain compatible with **RONV**. 6.3.11 and 12 focus on other critical landscape level parameters, particularly connectivity and access management. 6.3.13 ensures the maintenance or restoration of unique features and non-forested ecosystems.

Soil conservation and site productivity issues are covered Indicators 6.3.14 – 6.3.17.

6.3.1 If there are portions of the **management unit** where previous management activities have resulted in conditions that are inconsistent with the FSC-BC standards (i.e. areas of **poorly managed natural forest**s or former **plantation**s), these have been designated **restoration areas**, and it is evident that activities are planned and being implemented to restore those areas to conditions that are consistent with FSC-BC requirements.

a) Forest regeneration and succession

6.3.2 Regeneration surveys confirm that successful and ecologically appropriate regeneration is occurring on disturbed forest lands.

6.3.3 When site preparation is utilized, the **manager** selects a site preparation method that takes into consideration and balances the following factors: effectiveness of achieving management objectives and minimization of negative environmental impacts (including soil degradation).

6.3.4 At the landscape and stand levels, the spatial extent, temporal longevity and structural characteristics of non-tree-dominated early seral stages (i.e., herb and shrub stages), are **compatible with natural disturbance regimes** and meet the needs of early-seral-dependent species and cultural uses.

Means of Verification:

6.3.4 (i) Where habitat modeling results are available, they confirm that habitat requirements for non-tree-dominated early seral stage habitats are not compromised by stand management activities such as weeding or brushing.

b) Genetic, species, and ecosystem diversity

Stand and Gene Level Issues

6.3.5 Regeneration methods implemented by the **manager** maintain or enhance the structural and genetic diversity of forest stands by:

a) showing a preference for natural regeneration; and/or

b) using artificial regeneration methods (e.g., planting), with seed or stock produced from **local provenances**.

6.3.6 Seed trees, advanced regeneration or other sources of natural or artificial regeneration are selected to maintain species and genetic diversity.

6.3.7 Silvicultural treatments, including regeneration, maintain a diversity of tree species and stand types compatible with the **range of natural variability** at the **landscape level**.

6.3.8 **Silviculture** and stand management prescriptions contain objectives and measures for the maintenance and/or restoration of stand structure to conditions **compatible with the range of natural variability** at the stand and **landscape level**s. Structural components, including at a minimum canopy complexity, **live wildlife trees**, snags and **coarse woody debris** are maintained or restored to quantities and distributions that are **compatible with RONV.** (see *FSC BC Guidance* - Guidance on Applying **RONV** to Forest Management, with particular focus on Section 6.2, "**Natural Disturbance Regime**s," for guidance on stand level retention and maintenance of other structural components).

Means of Verification:

6.3.8 (i) Comparisons between present and projected stand structures and **RONV** descriptions (see also Indicators 6.1.7, 6.1.8 and 6.1.10).

6.3.8 (ii) Rationales provided for stand structural conditions that are not compatible with **RONV**.

6.3.8(iii) Where species habitat modeling or assessments are available, they indicate that stand level habitat supply is consistent with the long-term persistence of naturally occurring species dependent on those habitats (appropriate to the size and location of the **management unit**).

6.3.9 Within each **cutblock area** (>200 m wide or 100 ha in aggregate), the retention of dominant and co-dominant green trees and snags is consistent with meeting objectives in Indicator 6.3.8, as patches and/or single trees, and exceeds the following minimum levels (stems/ha, of which a minimum of 25% are snags where present):

NDT 1		**NDT 2**		**NDT 3**		**NDT 4**	
ESSF	Other	ESSF	Other	ESSF	Other	PP	Other
12	8	15	10	12	8	4	8

Landscape and Ecosystem Level Issues

6.3.10 **Forest management** maintains or restores a distribution of seral stages, patch sizes and interior habitat that are **compatible with the range of natural variability.**

Means of Verification:

6.3.10 (i) Comparisons, by BEC **variant**, between projected levels of old and mature forest, and natural levels calculated from estimated stand-replacing disturbance return intervals indicate that projected levels are **compatible with the range of natural variability**.

6.3.10 (ii) Where habitat modeling for patch size distribution or species assessments are available for interior-habitat-dependent species, they indicate that the projected patch size distribution and/or supply of suitable habitat is compatible with the **range of natural variability** and/or the long-term persistence of those species (appropriate to the size and location of the **management unit**).

6.3.11 The **manager** has wildlife and/or **landscape level** objectives for landscape **connectivity**, consistent with the long-term persistence of naturally occurring species, and is implementing management strategies that include **connectivity** corridor mapping and maintenance of mature and old forest landscape **connectivity** between various landscape components, stand types and key habitats, appropriate to the size and context of the **management unit** (See also Indicator 6.1.1).

6.3.12 Access management measures are implemented where required to meet non-timber objectives (e.g., to minimize displacement of access-sensitive species such as grizzly bears, to prevent human contamination of domestic watersheds, to protect cultural sites). The measures are consistent with the recommendations from assessments for access-sensitive species (See 6.1.3 g) and other recommendations by **qualified specialists** (e.g., wildlife biologists, health officials).

6.3.13 Where they occur on a **management unit**, unique **ecosystems** (e.g., **antique forests**, rare **site series**), unique **ecosystem** features (e.g., caves, mistletoe platforms, mineral licks) and non-forest **ecosystems** (e.g., wetlands, grasslands, rock outcrops) are maintained or restored.

c) Natural cycles that affect the productivity of the forest ecosystem.

6.3.14 **Forest management** maintains soil fertility and natural soil processes by:

a) limiting **detrimental soil disturbance** to less than 7% of the **timber harvesting landbase**, or

b) limiting **detrimental soil disturbance** to less than 10% of the **timber harvesting landbase**, where there are off-setting environmental, cultural or other non-economic benefits for the increases over 7%, and the benefits are explained in a written rationale.

Means of Verification:

6.3.14 (i) Soil disturbance survey results.

6.3.14 (ii) Assumptions regarding roads, landings and other **detrimental soil disturbance** in timber supply analyses (See also Criterion 5.6).

6.3.14 (iii) Efforts to minimize **detrimental soil disturbance** in planning and implementation of road construction, timber harvesting and **silviculture** treatments.

6.3.15 Measures are being implemented to promptly rehabilitate (less than 5 years) temporary access structures and unplanned **detrimental soil disturbance**, including any **detrimental soil disturbance** that exceeds the levels in Indicator 6.3.14.

6.3.16 Where fertilizers or other soil amendments (e.g., pulp sludge, manure) are used, preference is given to non-chemical alternatives that are of equivalent effectiveness, and the **manager** verifies that the chemical composition of the fertilizers or soil amendments (including inert ingredients) are not in contravention of FSC requirements (See also Criterion 6.6 and Indicator 4.2.1).

6.3.17 When fertilizers or soil amendments are used, measures are employed to avoid contamination of surface and ground waters, protect non-timber forest values and maintain long-term soil health (e.g., maintenance of soil organic matter, pH balance).

Means of Verification:

6.3.17 (i) Pre-fertilization baseline data and post fertilization monitoring data on soil physical and chemical properties, surface waters and ground waters

6.4 Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.

Intent for Criterion 6.4:

Criterion 6.4 applies to a series of **protected reserves** that are established on the **management unit**. Using conservation biology principles, such a network should be established prior to other activities taking place, to ensure that critical areas are reserved (i.e. decide what to leave before deciding what to take). This is encapsulated in 6.4.1. In reality, most operations are on-going prior to certification and the intention is not that all operations cease while the network is established. However, the **manager** should be able to demonstrate that on-going operations are not foreclosing options to maintain critical values. There should be a rationale for each reserve to understand how it is contributing to the whole, and to be most efficient reserves may have multiple objectives.

/cont'd ……

Intent for Criterion 6.4 (cont'd):

The extent of the **protected reserves** within the **management unit** is to be determined based on the level of representation of ecosystems in the broader landscape or region surrounding the **management unit**. Retention levels could also be fine-tuned by the 'responsibility' of the **manager** for a particular ecosystem, which is defined by the percent regional occurrence of a particular ecosystem in the **management unit**.

Minimum levels of broad scale ecosystem representation are outlined in Table P6-1, but additional relevant conservation biology principles to consider should include:

a) ensuring representation of finer scale features (e.g. **site series** groups, **enduring features**, landforms, forest type, productivity class etc),

b) protection of habitat features not protected elsewhere in the **management unit** (e.g., **critical habitat**s for red- and blue-listed or access-sensitive species, - see also Indicators 6.1.3, 6.2.1, 6.2.3, 6.5*bis*.1 and 9.1.1),

c) **connectivity** within the management area and between adjacent areas,

d) protection of rare and endangered ecosystems and ecosystem conditions that are or are predicted to be at risk (e.g., interior forest conditions, old seral conditions), and

e) scientific reference areas.

The minimum area requirements under this criterion include reserves routinely set-aside in the **management unit** (e.g. riparian reserves, wildlife tree patches) provided they are defined as permanent or **dynamic reserve**s as defined in 6.4.3, 6.4.4 and 6.4.5 (e.g. **riparian reserve zone**s, but not **riparian management zone**s; not including *de facto* reserved inoperable areas unless these areas meet specific ecological objectives as per 6.4.1). The design and management of reserves should be reassessed after any large-scale disturbance events (e.g. fires or windthrow events).

6.4.1 A network of **protected reserves** is established at multiple scales and managed within the **management unit** (see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on Planning). The reserve network:

a) maintains key environmental values and options to reserve critical areas are not foreclosed by on-going operations;

b) is delineated on maps, and where applicable, includes mapping of **dynamic reserves** and **dynamic reserve** replacement areas;

c) has written objectives for each reserve area related to that area's contribution to maintaining or restoring **ecological integrity;** and,

d) meets the applicable minimum percentage area for **ecosystem** representation by BEC **variant** within the **management unit**, as determined by Table P6 – 1 (see below).

Table P6 - 1. Minimum required area of protected reserves for ecosystem representation within a management unit by BEC variant, based on the level of protection in the surrounding area.

Context Outside of Management Unit	Management Unit Requirements[3]
Percentage of Protected Areas[1] by BEC variant, Ecosection or[2] BEC variant/Ecosection	**Minimum Reserves by BEC variant (%)[4]**
>20%	12
16.1-20%	15
12.1-16%	18
8.1-12%	20
4-8%	22
<4%	24

[1] Legally established long-term protected areas that are managed to maintain and/or restore biodiversity (principally includes BC Protected Areas and Federal Parks; where appropriate, potentially includes Wildlife Management Areas and private lands secured by legal covenants).

[2] Select the least constraining (see also *FSC BC Guidance– A companion document to the FSC Regional Standards for BC* – Guidance on Inventory).

[3] **Management unit**s meeting the "Small Operations" definition are exempt from the requirements in the table. See Small Operations Standards.

[4] Numbers refer to percentages of the naturally forested portion of the **management unit** applied by each BEC **variant**. Only the portions of the **dynamic reserve**s that have reached an age of at least 80% of the estimated average return interval for stand-replacing events contribute to meeting these requirements (See also Indicators 6.4.3 and 6.4.4).

6.4.2 The design and management of the reserve network contributes to the maintenance and/or restoration of **ecological integrity** by including at a minimum, areas whose size and distribution are sufficient to meet the following objectives:

a) includes representation of **ecosystem** variation within the **management unit** at a level more detailed than the BEC **variant**, using characteristics appropriate to the **management unit**

b) habitat requirements for naturally occurring species that are not provided for in a suitable condition in other parts of the **management unit**,

c) **connectivity** at the landscape and regional levels,

d) protection of rare and endangered **ecosystems** and **ecosystem** conditions that are or are predicted to be at risk (e.g., interior forest conditions, old seral conditions), and

e) scientific reference areas.

6.4.3 All **protected reserves** within **Natural Disturbance Types** 1 and 2 are permanent designations with fixed locations. Where the **manager** has identified ecological benefits for management treatments that mimic natural disturbances in **NDT**s 3 or 4, up to a maximum of 50% of the area of **protected reserves** in those **NDT**s can be managed as **dynamic reserves** (a minimum of 50% must remain permanent reserves).

6.4.4 Management treatments in **dynamic reserves** that are intended to mimic stand-replacing natural disturbances:

a) are employed on a frequency (i.e. rotation age) that is at least 1.2 times the estimated average return interval for those disturbances;

b) include stand level retention significantly above the estimated average natural retention levels for those disturbances;

c) use natural regeneration; and

d) allow for natural stand development.

6.4.5 Management activities within **protected reserves** are limited to low impact activities compatible with the protected reserve objectives, except under the following circumstances:

a) harvesting activities only where they are necessary to restore or create habitat to meet the objectives of the protected reserve, or to mitigate conditions that interfere with achieving the reserve objectives, or

b) road-building only where it is documented that it will contribute to the minimization of the overall environmental impacts within the **management unit** and will not jeopardize the purpose for which the reserve was designated.

6.5 Written guidelines shall be prepared and implemented to: control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.

6.5.1 Measures are implemented to ensure that occurrence rates of landslides, snow avalanches, waterborne erosion and sedimentation are not increased, due to road construction or forest harvesting, beyond the natural rates described in the description of the **range of natural variation** (see Indicator 6.1.7 and *FSC BC* Guidance - Guidance on **RONV**).

6.5.2 Road construction and forest harvesting do not occur on areas with a high **likelihood of landslide initiation,** or areas with a very high potential for snow avalanche initiation.

6.5.3 Road construction and forest harvesting do not occur on the following high risk areas, unless measures are implemented that reduce the risk of landslide or snow avalanche initiation, or prevent erosion and sedimentation:

a) areas of moderate **likelihood of landslide initiation** and high or very high landslide-induced stream sedimentation hazard;

b) areas of moderate **likelihood of landslide initiation** and a high to very high likelihood of the landslide reaching areas of human habitation;

c) areas with a high potential for snow avalanche initiation; and

d) areas of high or very high road/ditch/surface erosion hazard and high or very high sediment delivery.

6.5.4 Harvesting within or adjacent to areas with a high or moderate **likelihood of landslide initiation** does not significantly increase windthrow hazards in those areas.

6.5.5 The **manager** implements measures to maintain the **ecological integrity** of aquatic **ecosystems**, including at a minimum:

a) planning of road locations to minimize stream crossings and construction of roads within **riparian management area**s,

b) stream crossing construction measures to minimize disturbance to riparian areas, stream banks and stream channels,

c) timing of stream crossing construction to avoid fisheries sensitive seasons (e.g. spawning),

d) locating and constructing landings in ways that avoid **riparian management area**s and detrimental impacts on **hydrologic features**,

e) locating and constructing roads, landings, backspar trails and skidroads in ways that minimize disruption of natural drainage patterns (e.g., drainage systems are planned and constructed to avoid diversion of surface waters; road widths are minimized to limit the interception of subsurface water),

f) employing yarding techniques that do not disturb stream channels,

g) where stream temperature is critical, maintaining sufficient cover adjacent to those streams to ensure aquatic **ecosystem**s are not detrimentally impacted from temperature changes, and

h) where **channel assessment**s indicate decreasing stability, halting road construction and harvesting in relevant portions of watersheds, unless it can be shown that further development will not slow channel recovery or contribute to further channel instability.

6.5.6 **Machine-free zones** are established on all streams, lakes, wetlands and marine shorelines. The **machine-free zones** are:

a) at least 7 m in width;

b) not entered by machinery, except where required for construction of crossings or other approved infrastructure, or restoration of riparian or stream channel functions, and only if it can be demonstrated that no significant environmental damage will result; and

c) areas within which, if harvesting occurs, non-commercial trees and understory vegetation are retained for protection of riparian functions.

6.5.7 Active roads and other potential sediment sources are identified and monitored for sediment production on a regular basis. Deactivation, rehabilitation and/or restoration plans are prepared and implemented to control all significant human-induced sediment sources.

6.5.8 The **manager** employs measures to control increases in peak flow resulting from management activities, including in snowmelt-dominated watersheds, maintaining weighted **equivalent clearcut area (ECA)** to less than 25%, unless recommended otherwise by a publicly available **hydrologic assessment**.

6.5 bis Riparian ecosystems and all their functions shall be maintained or restored.

6.5.*bis*1 The **manager** maintains and/or restores riparian functions along rivers, streams, wetlands, lakeshores and marine shores by:

a) completing an **integrated riparian assessment** for the **management unit**, or each **riparian assessment unit** within the **management unit**, according to the framework found in Appendix B (Requirements for Riparian Management), or if not, in a manner that meets the intent and addresses all the issues raised in the framework; and,

b) implementing a riparian management regime that is consistent with the results of the assessment and meets or exceeds the retention budgets for Reserve Zones and Management Zones specified in Table 3 of Appendix B (Requirements for Riparian Management).

Means of verification:

P6.5*bis.*1 (i) Documentation of riparian management measures and field assessment of their implementation.

P6.5.*bis*1 (ii) Documentation of stream, wetland, lakeshore and marine shoreline inventories.

P6.5*bis.*1 (iii) Documentation of riparian assessment procedures, and rationale.

P6.5*bis.*1 (iv) Riparian management assumptions in timber supply analyses and allowable annual cut (AAC) calculations.

6.6 Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.

6.6.1 Where **chemical pesticides** are used on the **management unit**, plans are in place to continually reduce and finally eliminate their use through **integrated pest management**. The phase out period shall be a period of no more than 5 years from the date of initial certification of the **management unit**, and applies only to use on the **management unit** itself. The only exception would be the use of a **pesticide** for a limited time to control an exotic invasive species that poses a high risk to the **ecological integrity** of forest **ecosystem**s, where there were no known feasible non-chemical alternatives.

Means of Verification:

6.6.1 (i) Forest health plans with regard to controls of insect, diseases and weeds.

6.6.1 (ii) **Silviculture** plans and prescriptions related to brushing and weeding.

6.6.1 (iii) Assumptions in AAC calculations related to brushing and weeding and control of insects and disease.

6.6.2 Where **chemical pesticides** are used on the **management unit** during the phase out period, there is evidence of consistent effort to meet plans for their phase out, including the use of **integrated pest management**, with emphasis on prevention strategies.

Means of Verification:

6.6.2 (i) Forest health plans with regard to controls of insect, diseases and weeds – integrated pest management components.

6.6.3 Where tree seedlings or other materials for use on the **management unit** are purchased from outside suppliers, **manager**s take ongoing actions to source materials that are consistent with eliminating the use of **chemical pesticides**.

Means of Verification:

6.6.3 (i) Correspondence between the **manager** and suppliers who may be using **pesticide**s.

6.6.3 (ii) Selection criteria for requests for proposals, purchase orders, or bid selection related to any services or materials that may involve use of **pesticide**s.

6.6.4 **Chemical pesticides** prohibited by Criterion 6.6 are not used on the **management unit** (See **highly hazardous pesticides** in the glossary (Appendix A) and Appendix C).

Means of Verification:

6.6.4 (i) Records of chemical use on the **management unit**.

6.6.5 Where **chemical pesticides** are used, the **manager** takes measures to avoid risks to human health and the environment (e.g., prior notification of tree planters, **First Nation**s, and other forest users of **pesticide** use, stream buffers), and complies with regulatory requirements under the *Pesticide Control Act and the Workers Compensation Act*.

Means of Verification:

6.6.5 (i) Operational plans, field assessments and monitoring of **pesticide** applications.

6.6.5 (ii) Standard operating procedures regarding **pesticide** use on the **management unit** and regarding use of out-sourced materials that may be contaminated (e.g., tree seedlings).

6.6.5 (iii) Interviews with **forest worker**s (including contractors), **First Nation**s, **local** wildlife biologists and other forest users who may be impacted or familiar with impacts from **pesticide** use.

6.6.5 (iv) Permits issued for **pesticide** use in the **management unit**, and compliance monitoring for those permits.

6.7 Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.

6.7.1 The **manager** implements measures, including worker training, to prevent the unintended release of **chemicals**, petroleum products, containers and non-organic wastes, and avoid health and environmental risks due to their disposal.

Means of Verification:

6.7.1 (i) Standard operating procedures regarding the prevention of contamination from the use and disposal of **chemicals** and other potential contaminants.

6.7.1 (ii) Emergency plans for dealing with non-intentional release of chemicals and other potential contaminants.

6.7.1 (iii) Field observation of chemical storage and disposal.

6.7.1 (iv) Interviews with staff and contractors regarding the disposal and handling of chemicals and other potential contaminants (Are they trained?)

6.8 Use of biological control agents shall be documented, minimized, monitored and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.

6.8.1 Exotic **biological control agents** are used only as part of a pest management strategy for the control of **exotic species** of plants, pathogens, insects or other animals when other non-chemical pest control methods are, or can reasonably be expected to be, ineffective. Such use is contingent on peer-reviewed scientific evidence that the agents in question are non-invasive and are safe for indigenous species.

6.8.2 Where **biological control agents** are used, there is compliance with relevant provincial laws, national laws and internationally accepted scientific protocols, including, in 2002, the provincial Plant Protection Act and the federal Pest Control Products Act, Plant Protection Act and Canadian Environmental Protection Act.

6.8.3 No **genetically modified organisms** are used, in accordance with the FSC guidelines on **genetically modified organisms**.

6.9 The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.

6.9.1 Exotic plant or animal species are only introduced after a scientific evaluation that determines that they are not invasive and will bring environmental benefits without entailing significant adverse ecological impacts.

6.10 Forest conversion to plantations or non-forest land shall not occur, except in circumstances where conversion:

a) entails a very limited portion of the Forest Management Unit; and

b) does not occur on High Conservation Value Forest areas; and

c) will enable clear, substantial, additional, secure, long term conservation benefits across the Forest Management Unit.

a) Entails a very limited portion of the Forest Management Unit

6.10.1 Areas of new conversions to **plantation**s or other non-forest uses (NOT including roads, landings and other infrastructure directly related to forest management, see also 6.3.14):

a) do not exceed 5% of the **timber harvesting landbase** of the **management unit**;

b) are located in previously harvested poorly-managed forest, or if that forest type is not available, in previously harvested **well-managed natural forest**, or if that forest type is not available, in un-harvested, non old growth forest, and only if none of the previous areas are available, in old growth forest;

c) do not directly result in the area of old growth forest falling below the estimated mean area of old growth forest determined by the description of the **range of natural variability** completed under Indicator 6.1.7; and,

d) are otherwise consistent with Principle 10.

b) Does not occur on High Conservation Value Forest areas

c) Will enable clear, substantial, additional, secure, long term conservation benefits across the Forest Management Unit

6.10.2 **Appropriate to the scale and intensity** of operations, the **manager** demonstrates the conservation benefits enabled by conversion, and the impacts of the conversion, as evaluated and reported by **qualified specialists**. The evaluation process includes:

a) evaluation of the conservation benefits enabled by the conversion;

b) evaluation of the environmental impacts of the conversion itself, taking into account impacts both at the **management unit** level and at the **landscape level**;

c) the **social impacts** and benefits entailed by the conversion;

d) review of and input on the conversion area and the offsetting conservation benefits from **qualified specialists**, affected parties and relevant interests (e.g., **First Nation**s, agencies, **local** communities, conservation organizations);

e) conclusions regarding whether the offsetting benefits meet Criterion 6.10; and

f) if the conversion evaluation report concludes the proposed conversion meets Criterion 6.10, specific recommendations on how the offsetting benefits for conversions should be secured in a manner that ensures the benefits will be maintained over the **long term** (e.g., legal designations, restrictive covenants).

6.10.3 Management objectives and measures identified in the final evaluation report as outlined in 6.10.2 are incorporated into the **management plan** and other relevant documents, and are implemented.

Principle 7: Management Plan

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

7.1 The management plan and supporting documents shall provide:

a) Management objectives.

b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and profile of adjacent lands.

c) Description of silvicultural and/or other management system, based upon the ecology of the forest in question and information gathered through resource inventories.

d) Rationale for rate of annual harvest and species selection.

e) Provisions for monitoring of forest growth and dynamics.

f) Environmental safeguards based on environmental assessments.

g) Plans for the identification and protection of rare, threatened and endangered species.

h) Maps describing the forest resource base including protected areas, planned management activities and land ownership.

i) Description and justification of harvesting techniques and equipment to be used.

a) Management objectives.

7.1.1 A long-term **management plan** that confirms the **manager**'s commitment to the FSC-BC Regional Standards by describing long-term objectives, management strategies and operational approaches that comply with the Standards, is maintained and updated at least every five years (See *FSC BC Guidance – A Companion document to the FSC Regional Standards for BC* – Guidance on Planning). The **management plan** includes:

a) measurable management objectives and management indicator(s) by which their achievement can be assessed;

b) management objectives that address short- and long-term time frames as applicable, and which are sufficiently specific to provide a basis for developing operational strategies and practices;

c) depiction of the specific geographic area to which management objectives apply (e.g., **management unit**, specific reserve, **local** community);

d) a rationale, including underlying assumptions, for each management objective; and,

e) incorporates objectives derived from ongoing public participation (See also Indicator 4.4.1) and objectives identified through the **First Nation**s protocol (See also Indicator 3.1.2).

b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and profile of adjacent lands.

7.1.2 The **management plan** describes terrestrial and aquatic species and habitats and timber, non-timber, water, recreation, cultural and visual resources located within the **management unit**, with reference to applicable inventories (See also Indicators 6.1.1, 6.1.2, 6.1.3 and 5.6.1)

7.1.3 The **management plan** describes the **range of natural variability** (See also Indicator 6.1.7).

7.1.4 The **management plan** describes environmental limitations and risk identified through inventory and assessments (See also Indicators 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7, 6.1.8).

7.1.5 The **management plan** describes High Conservation Value Forest attributes and associated **conservation attributes** identified through assessments (See also Indicator 9.1.1).

7.1.6 The **management plan** describes historical land uses, socio-economic conditions, management regimes and conditions on lands within and adjacent to the **management unit**.

7.1.7 The descriptions, inventories and maps required for developing management objectives, strategies and practices are included or referenced in the **management plan**.

c) Description of silvicultural and/or other management system, based upon the ecology of the forest in question and information gathered through resource inventories.

7.1.8 Management approaches to be used in operational planning and implementation that will fulfill management objectives are described in the **management plan** (including where necessary, plans for phasing out **pesticide** use).

7.1.9 Operational plans are prepared to guide management activities at both the landscape and site level to implement the management objectives, strategies and approaches identified in the **management plan**.

d) Rationale for rate of annual harvest and species selection.

7.1.10 A rationale for the rate of annual harvest is included in the **management plan** and is supported by an analysis as set out under Criterion 5.6.

7.1.11 The **management plan** provides direction, for the purpose of operational planning, on the selection of tree species used in reforestation (See also Indicator 6.3.7).

e) Provisions for monitoring of forest growth and dynamics.

7.1.12 The **management plan** contains provisions for monitoring forest growth and dynamics (See also Indicator 8.2.3).

f) Environmental safeguards based on environmental assessments.

7.1.13 The **management plan** includes management strategies to minimize environmental impacts, consistent with the results of environmental assessments (See also Indicators 6.1.4, 6.1.5, 6.1.6, 6.1.7, 6.1.8, 6.1.9 and 6.1.10, and Criteria 9.1 and 9.3).

g) Plans for the identification and protection of rare, threatened and endangered species.

7.1.14 The **management plan** contains provisions for rare, threatened and **endangered species** (See also Criterion 6.2).

h) Maps describing the forest resource base including protected areas, planned management activities and land ownership.

7.1.15 A map and legal description showing the location and **tenure** status of the **management unit** is included in the **management plan** (See also Indicator 2.1.2).

7.1.16 **Legal or customary tenure or use rights** of others within the **management unit** are identified, described and, where appropriate, mapped and are included in the **management plan**.

7.1.17 Maps of a scale consistent with **management plan** reporting are included in the **management plan**, and larger scale maps consistent with operational planning are referenced to provide detail where necessary. **Management plans** include or reference accessible maps describing land use and management designations (including HCVFs) and other maps as necessary to describe the current status and, where values warrant, projected future conditions of forest and forest land characteristics related to management objectives.

7.1.18 Maps necessary for **management plan** reporting on management objectives flowing from Principles 3, 6, 9 and 10 are included in the **management plan**.

i) Description and justification of harvesting techniques and equipment to be used.

7.2 The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

7.2.1 Revisions to the **management plan** and supporting operational plans are made when required to respond to:

a) the results of monitoring (See also Indicators 8.4.1, 8.4.2)

b) new technical or scientific information garnered through assessments, land use planning or other sources relevant to the **management unit**.

c) new social and economic information garnered through public participation process and consultation (See also Indicators 4.4.1, 9.2.1, 9.3.4 and 9.4.3)

7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.

7.3.1 **Forest workers** receive adequate training and supervision to ensure proper implementation of the **management plan**.

7.4 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.

7.4.1 With the exception of sensitive or confidential commercial, cultural or ecological information, the **management plan**, supporting operational plans and assessments are made available to the public in a reasonable manner.

7.4.2 Input from interested parties, is solicited during public review of the draft **management plan**. Actions to address this input and accompanying rationales are documented in the **management plan** as appropriate.

Principle 8: Monitoring and Assessment

Monitoring shall be conducted – appropriate to the scale and intensity of forest management – to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

8.1 The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations as well as the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and repeatable over time to allow comparison of results and assessment of change.

8.1.1 A documented monitoring program is in place.

8.1.2 Persons responsible for implementing and maintaining monitoring programs are identified.

8.1.3 In a manner determined through consultation, **First Nation**s and **directly affected persons** participate in the design, implementation and evaluation of monitoring programs.

8.1.4 The monitoring program includes a monitoring plan maintained by the **manager**. The monitoring plan describes:

a) elements to be monitored including **HCVF**s as set out under Criterion 9.4;

b) monitoring Indicator(s) for each element;

c) rationale for the selection of each element and monitoring Indicator(s);

d) consistent and replicable monitoring procedures;

e) the frequency and intensity of monitoring, and the frequency of analysis, consistent with the nature of the monitoring Indicator(s), management activities, environmental sensitivity of the site, assessed risks, stakeholder concerns, performance history, and changing environmental conditions; and,

f) relevant baseline information.

8.1.5 The monitoring plan is periodically updated and available to those doing the monitoring or working with monitoring data, and a clear link between the monitoring plan and **management plan** is established.

8.1.6 Any change in monitoring procedure is documented, including details of any overlapping calibration when old and new procedures are run simultaneously.

8.1.7 Monitoring records are compiled in a secure, accessible monitoring **database**(s).

8.1.8 An adequate mechanism is implemented for quality assurance and quality control of the monitoring program.

8.2 Forest management should include the research and data collection needed to monitor, at a minimum, the following Indicators:

a) yield of all forest products harvested;

b) growth rates, regeneration and condition of the forest;

c) composition and observed changes in the flora and fauna;

d) environmental and social impacts of harvesting and other operations;

e) costs, productivity, and efficiency of forest management.

a) Yield of all forest products harvested

8.2.1 Data regarding the yield of timber harvested from the **management unit** (e.g., volume, species and grade) sufficient to assess performance with respect to management objectives, are collected and maintained in the monitoring **database**.

8.2.2 Where the **manager** is responsible for the harvest of **non-timber forest products** within the **management unit**, data regarding their yield, sufficient to assess performance with respect to management objectives, are collected and maintained in the monitoring **database**.

b) Growth rates, regeneration and condition of the forest

8.2.3 Data are collected and maintained in the monitoring **database** concerning growth rates, regeneration, forest health, productivity, condition of the forest, and disturbances resulting from forest operations or other causes.

c) Composition and observed changes in the flora and fauna

8.2.4 Data are collected and maintained in the monitoring **database** related to composition and observed changes in the flora and fauna as a result of forest operations and other disturbances, including sensitive species and their habitats. (See Indicator 6.1.3 g).

8.2.5 The condition of habitat identified under Indicator 6.2.1 is monitored, consistent with recovery and/or species **management plans** as set out under Indicators 6.2.2 and 6.2.3.

d) Environmental and social impacts of harvesting and other operations

8.2.6 Data are collected and maintained in the monitoring **database** related to the condition of selected watersheds (e.g., sensitive or consumptive watersheds) including, as applicable, sediment sources, **Equivalent clearcut area (ECA)**, channel stability and riparian condition.

8.2.7 **Appropriate to the scale and intensity** of operations, monitoring addresses **social impacts** resulting from management activities, focusing on elements identified through consultation with **First Nation**s and **directly affected persons**.

8.2.8 When employed on the **management unit**, the use and disposal of chemical **pesticide**s and other potential contaminants are monitored, with a focus on phase out strategies and avoiding environmental impacts and risks to human health (see also Criteria 6.6 and 6.7).

e) Costs, productivity, and efficiency of forest management

8.2.9 Costs and production associated with harvesting, including stumpage payments, are documented to enable evaluation of **forest management** efficiency.

8.3 Documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as "chain of custody".

8.3.1 A procedure is in place to identify FSC-certified products, including documentation regarding the date, cutting permit/cutblock of origin, quantity, and FSC certificate registration code of products leaving the **management unit**; for large operations this includes marking logs before transportation such that the cutting permit and cutblock of origin can be identified.

8.4 The results of monitoring shall be incorporated into the implementation and revision of the management plan.

8.4.1 Findings from monitoring are regularly summarized, analyzed and documented to identify discrepancies between outcomes (e.g., yields, growth, ecological changes) and expectations (e.g., plans, forecasts, anticipated impacts).

8.4.2 The results of monitoring are incorporated into periodic revisions of the **management plan**, policies and procedures.

8.4.3 Unanticipated impacts identified through monitoring are acted upon.

8.5 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring Indicators, including those listed in Criterion 8.2.

8.5.1 A regular summary is compiled of the results of monitoring. The summary is made available to interested parties.

Principle 9: Maintenance of High Conservation Value Forests

Management activities in High Conservation Value Forests shall maintain or enhance the attributes which define such forests. Decisions regarding High Conservation Value Forests shall always be considered in the context of a precautionary approach.

9.1 Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.

9.1.1 The **manager** has completed an assessment to determine the presence of **High Conservation Value Forests** (**HCVF**) and associated **conservation attributes** within or pertaining to the **management unit** according to the assessment framework found in Appendix D, or if not, in a manner that meets the intent and addresses all the issues raised in the framework (see also 9.1.2). The assessment is carried out by **qualified specialists**, including consultation with **directly affected persons** and relevant interests (e.g., **First Nation**s, regulatory agencies, **local** communities, conservation organizations).

Means of Verification:

9.1.1(i) Documented assessment methodology and roles of participants.

9.1.1(ii) Interviews with those involved in the **HCVF** assessment process.

9.1.2 The **HCVF** assessment:

a) is based on the best available information including scientific, traditional and **local** knowledge;

b) is conducted using a hierarchical approach that includes consideration and identification of **HCVF**s and **HCVF** attributes at global, regional, landscape and site levels;

c) identifies **conservation attributes** associated with each **HCVF** present, the significance of each conservation attribute, and measurable thresholds for their maintenance;

d) includes documentation of underlying assumptions, uncertainties in data and knowledge and how they have been dealt with, and the rationale behind management recommendations; and,

e) includes independent, third party input from and review by **qualified specialists**.

Means of Verification:

9.1.2 (i) Documented assessment methodology.

9.1.2 (ii) Assessment report, including associated maps and other documents.

9.1.2 (iii) Interviews with those involved in the **HCVF** assessment process.

9.1.3 When identified during the assessment, **HCVF**(s) and, where they can be represented spatially, associated **conservation attributes** are delineated on maps consistent with the scale of the designation and the HCV (e.g., global, national, regional, large home range, isolated occurrence). This is done in a manner that clearly demonstrates the location of the **HCVF**(s) in relation to the **management unit**. Where there is a need to maintain confidentiality regarding the location of a sensitive site, the exact location of the **HCVF** or conservation attribute is not mapped or the information is otherwise held in confidence.

Means of Verification:

9.1.3 (i) **HCVF** assessment report.

9.1.3 (ii) Accompanying maps.

9.1.3 (iii) **Management plan** maps.

9.1.3 (iv) Operational level maps when operations occur in **HCVF**s.

9.1.4 The assessment recommends management strategies and practices that will maintain or restore identified **HCVF conservation attributes** consistent with the **precautionary approach** including:

a) specific management measures to maintain or restore the **conservation attributes** (e.g., reserves, silvicultural practices, access management);

b) development and application of a risk assessment methodology appropriate to the conservation attribute to be maintained or restored (see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on Environmental Risk Assessment);

c) development and application of a monitoring program; and,

d) development and application of an adaptive management strategy appropriate to the conservation attribute and its level of sensitivity.

9.1.5 The assessment report, including the **manager**'s proposed strategies and measures for the maintenance of **HCVF**s and **conservation attributes**, with accompanying rationale, has been made available for review by qualified specialists, **directly affected persons** and relevant interests (e.g. **First Nation**s, regulatory agencies, **local** communities, conservation organizations).

9.1.6 The advice and comments received through the reviews referred to in indicator 9.1.5 and the response to them, are documented and maintained by the **manager**, and are made publicly available. Where the results of the assessment are contested by qualified specialists, **directly affected persons** and/or relevant interests; the onus is on the **manager** to prove that **HCVF**s and their associated **conservation attributes** have been adequately identified and assessed, and will be maintained under the proposed management strategies.

9.1.7 The assessment report is updated every five years or more frequently depending on the sensitivity of the **conservation attributes**. The update includes new information garnered through consultation, monitoring (See also Indicators 8.1.1-8.1.6 and 9.4.1-9.4.3) and adaptive management.

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

9.2.1 The forest **manager** consults with **directly affected persons**, **qualified specialists** and **First Nations** on the identification of the High Conservation Values and the management options thereof.

9.3 The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.

9.3.1 The **manager** documents in the **management plan** and supporting operational plans the measures necessary to maintain or restore each identified **HCVF** or **conservation attribute**.

9.3.2 The management strategies and measures selected to maintain or restore conservation attribute(s) are consistent with a **precautionary approach**, and with respect to each **HCVF** or conservation attribute, the **manager** shows that the measures:

a) will create conditions with a very high probability of securing the long-term maintenance or the restoration the **HCVF** or conservation attribute;

b) are being implemented; and,

c) are proving effective or are adapted as required based on the results of monitoring (See also Indicators 9.4.1-9.4.3).

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

9.4.1 The **manager** sets up and implements a program to monitor the status of **HCVF**s and **conservation attributes** including the effectiveness of the measures employed for their maintenance or restoration. The monitoring program is designed and implemented consistent with the requirements of Principle 8.

9.4.2 The monitoring program is capable of alerting the **manager** to changes in the status of an **HCVF** or conservation attribute, and determining if the conservation measures are effective in maintaining or restoring the **HCVF** or attribute. The results of monitoring are assessed consistent with the monitoring requirements of Indicator 8.1.1.

9.4.3 When monitoring results indicate increasing risk to a specific conservation attribute, the **manager** re-evaluates the measures taken to maintain or enhance that attribute, and adjusts the management measures to reverse the trend.

Principle 10: Plantations

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

10.1 The management objectives of the plantation, including natural forest conservation and restoration objectives, shall be explicitly stated in the management plan, and clearly demonstrated in the implementation of the plan.

10.1.1 Where **plantation** management regimes are employed in a **management unit**, social, economic and **natural forest** conservation or restoration objectives associated with those **plantation**s are being achieved.

10.2 The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods, shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocks shall be consistent with the patterns of forest stands found within the natural landscape.

10.2.1 The location, management and extent of **plantation** areas are consistent with **landscape level biodiversity** objectives, strategies and measures, including seral stage distribution, old-growth representation, patch size distribution, forest interior habitat, **landscape connectivity**, tree species diversity and the conservation of rare and **critical habitat**s (See Indicators 6.3.10 to 6.3.13).

10.3 Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.

10.3.1 Selection of species and genotypes for areas under **plantation** management regimes is compatible with **local** environmental conditions, forest health considerations and **biodiversity** objectives.

10.3.2 Design and layout, selection of species and planning of harvesting cycles for areas under **plantation** management regimes enhance the **management unit**'s overall contribution to the **local** economy (e.g., **local** processing, timber supply, **local** economic diversification).

10.4 The selection of species for planting shall be based on their overall suitability for the site and their appropriateness to the management objectives. In order to enhance the conservation of biological diversity, native species are preferred over exotic species in the establishment of plantations and the restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.

10.4.1 Preference is given to planting **native species** from **local provenances**.

10.4.2 Exotic tree species are only utilized where it has been demonstrated that they are not, or will not become invasive species, and will not result in the introduction of other pests or diseases, on or off the **management unit** (See also Indicator 10.8.2).

10.5 A proportion of the overall forest management area, appropriate to the scale of the plantation and to be determined in regional standards, shall be managed so as to restore the site to a natural forest cover.

Explanatory Note for Criterion 10.5:

The presence of absence of **plantations** within a **management unit** is determined according to the definition in the Glossary. **Plantation** management is generally rare in BC; the vast majority of forest management and forest production in BC is focused on **natural forest** stands rather than **plantations**. Most of the forest areas that could potentially be classified as "**plantation** management regimes" are located in low elevation coastal forests, or rarely in low elevation interior wetbelt forests. However, these areas tend to generally be under-represented in BC's protected areas network, have significant pressures for non-forest landuses, and are often associated with increased threats to biodiversity values, as indicated by a higher frequency of red- and blue-listed species. One example would be the short-rotation cottonwood **plantations** on private lands in the Fraser Valley, where there are also extensive areas of forest conversion to agriculture and urban development, or on floodplains where there are extremely high biodiversity values.

Due to the relatively few **plantations** present in BC, and the significant threats to biodiversity already present in areas where most **plantations** already occur, it was felt that the Regional Standards for BC should require a high degree of restoration for existing **plantations**, and severely limit establishment of new **plantations**. Therefore Indicator 10.5.1 limits total **plantation** area to 10% of the **timber harvesting landbase** of a **management unit** (i.e. an existing total **plantation** would have to restore 90% of its area). Indicator 10.5.1 also requires that the **plantation** area occupy no more than 30% of the **THLB** in any single BEC **variant** to ensure that impacts associated with the **plantation** are not concentrated in one area.

10.5.1 The extent of area under **plantation** management regimes does not exceed 10% of the total **timber harvesting landbase** of the **management unit,** and no more than 30% of the **THLB** of any single BEC **variant** within the **management unit** (unless further concentration in a BEC **variant** would decrease environmental impacts).

10.5.2 Where the extent of area within the **management unit** that has stand characteristics and past or present management practices that are consistent with **plantation** management regimes (i.e. former or present **plantation**s) exceeds the maximum requirement under Indicator 10.5.1:

a) sufficient areas have been identified for restoration to **natural forest**s to meet the requirement within a timeframe less than the average rotation age of the **plantation**s;

b) the **restoration areas** are identified on maps; and,

c) they are actively being restored (See also Indicator 6.3.1).

10.6 Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.

10.6.1 Management practices in **plantation** areas are consistent with soil and water conservation measures specified under Criteria 6.3, 6.5 and 6.5*bis*.

10.7 Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.

10.7.1 Management regimes in **plantation** areas are designed to minimize forest damage from fire, pests, diseases, wind and other factors.

10.7.2 Where **plantation**s are shown to significantly increase the level of pest infestations or disease within the **plantation**s or in adjacent stands, **plantation** management is adjusted to avoid such problems or those **plantation**s are phased out in a timely manner.

10.7.3 Chemical use in **plantation** areas is consistent with Criteria 6.3, 6.6 and 6.7.

10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in Principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.

10.8.1 Where **plantation** management regimes are present, their management and impacts are monitored consistent with the measures specified in Principle 8.

10.8.2 Before exotic tree species are planted on an operational basis, the **manager** has completed exotic tree species research trials for each species that are:

a) limited to a maximum of 10 ha in aggregate;

b) of sufficient duration to determine potential long-term impacts (e.g., a full harvest rotation); and,

c) designed and assessed by **qualified specialists**, including a forester, conservation biologist and agrologist.

10.9 Plantations established in areas converted from natural forests after November 1994 normally shall not qualify for certification. Certification may be allowed in circumstances where sufficient evidence is submitted to the certification body that the manager/owner is not responsible directly or indirectly for such conversion.

10.9.1 Areas under **plantation** management regimes established before November 1994, or that were established since November 1994 and the **manager** or owner is not responsible directly or indirectly for the conversion, and do not meet Criteria 10.2 or 10.5 (e.g., exceed the requirements of 10.5.1), are designated **restoration areas** (See also Indicator 6.3.1).

10.9.2 Where areas under **plantation** management regimes have been established after November 1994, and the **manager** or owner are directly or indirectly responsible for the conversion, they are established in accordance with Criterion 6.10.

Appendix A: Glossary

The following list provides definitions for technical terms used in the FSC-BC Regional Standards. Terms that have been defined by FSC International are referenced as (FSC-AC, July 2004). All other terms have been defined by the BC Regional Standards for use in the British Columbia context. Where a term defined by FSC International has been further defined for use in the FSC-BC Regional Standards, the further definition follows the FSC International definition and begins with the phrase, "In the BC context…"

To assist the reader, each occurrence of a defined term is **bolded** throughout these standards**.**

Aboriginal Rights: A practice, custom or tradition integral to the distinctive culture of the aboriginal group claiming the right. Often **aboriginal rights**, including site specific rights, can be made out even if title cannot: based on R. v. Van der Peet, [1996] 2 S.C.R. 507; R. v. Adams, [1996] 3 S.C.R. 101. For a definition of **aboriginal rights** with regard to consultation, please see the definition for **consulting with the First Nation**.

Aboriginal Title: The unique title to the **First Nation**'s lands, territories and resources which arises from occupancy before the assertion of British sovereignty, or which arises from and reflects the pattern of land holdings under aboriginal law. **Aboriginal title** confers more than the right to engage in site-specific activities. What **aboriginal title** confers is the right to the land itself. If a Nation has **aboriginal title**, the land may be used for a variety of activities that need not be elements of a practice, custom or tradition integral to the distinctive culture of the aboriginal group claiming the right: based on Delgamuukw v. British Columbia, [1997] 3 S.C.R. 1010.

Agencies responsible for enforcement or auditing of laws affecting forest management: Includes the Ministry of Forests; Ministry of Environment; Ministry of Agriculture and Lands; the Forest Practices Board; the Private Managed Forest Land Council; the Department of Fisheries and Oceans; the Workers Compensation Board; and **First Nation**s agencies specific to individual **First Nation**s.

Antique forests: Old growth forests of exceptional age and/or environmental continuity; forest stands where the time since the most recent stand-replacing event exceeds the age of the oldest trees in the stand (often by 2 or more generations).

Applicable law: Includes applicable legislation as well as common law principles (e.g., legal principles related to contracts and **Aboriginal Title and Rights**).

Applicable legislation and guidebooks: The legislation and guidebooks that apply to the operations associated with the **management unit**. (see also *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on Applicable Legislation and Guidebooks).

Appropriate to the scale and intensity: The phrase "**appropriate to the scale and intensity**" is used in Indicators and Verifiers to indicate to a certifying body that judgment is required in deciding the level of effort that can reasonably be expected from a **manager** in addressing a particular element of the FSC-BC Regional Standard. The intent is to relate expectations to the **manager**'s resources, size of the **management unit**, and potential management impacts related to the specific element. Consideration should also be given to the significance of potential impacts of the management activities addressed, the sensitivity of values potentially affected, the reversibility of the potential effects and the relative importance of the values.

Aquatic habitats: Those parts of the environment on which an organism depends, directly or indirectly, in order to carry out its life, that are on, in or partially submerged in water.

Binding international agreements: For the purposes of Criterion 1.3, in the BC context, **binding international agreements** relevant to forest operations include:

- Convention on **Biological diversity**
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)
- Convention on International Trade in **Endangered Species** of Wild Fauna and Flora (CITES)
- Convention for the Protection of the World Cultural and Natural Heritage
- Convention on the Protection of Migratory Birds in Canada and the United States
- 1909 Boundary Waters Treaty
- Framework Convention on Climate Change
- North American Agreement on Environmental Cooperation
- International Labour Organisation (ILO) C.100: Equal Remuneration Convention
- ILO C.111: Discrimination (Employment and Occupation) Convention

Biodiversity: see Biological diversity

Biogeoclimatic Ecosystem Classification (BEC): A hierarchical system that organizes **ecosystems** at three levels of integration: site, regional and chronological. At the regional scale the system integrates climate, vegetation and zonal site classifications. The zonal or regional climate (reflected by vegetation and soil relationships) defines the basic biogeoclimatic unit, the subzone. Subzones are grouped into biogeoclimatic zones (based on similar climax tree species), and may be further subdivided into ***variants*** based on further refinements of climate (e.g., wetter, warmer, snowier), and the presence or absence of particular tree species. At the site level the most commonly used unit is the **site series**, defined as all land areas within a BEC subzone or **variant** with similar or equivalent physical properties that will produce similar plant communities at climax. **Successional** communities are grouped into a series of structural or seral stages for each **site series** to define the chronological level of integration (for further information see http://www.for.gov.bc.ca/research/becweb/becinfo).

Biological control agents: Living organisms used to eliminate or regulate the population of other living organisms (FSC-AC, July 2004).

Biological diversity values: The intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of **biological diversity** and its components. (See Convention on **Biological Diversity**, 1992) (FSC-AC, July 2004).

Biological diversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic **ecosystems** and the ecological complexes of which they are a part; this includes diversity within species, between species and of **ecosystems**. (See Convention on **Biological Diversity**, 1992) (FSC-AC, July 2004).

Chain of custody: The channel through which products are distributed from their origin in the forest to their end-use (FSC-AC, July 2004).

Channel assessment: Descriptions of stream reach characteristics, conditions, disturbance factors and ratings of channel stability; *reconnaissance assessments* usually include reach classification, airphoto interpretation of channel conditions before and after watershed disturbances (for channels > 30 m wide), and field-based descriptions of channel morphology and changes in morphology resulting from disturbance; *detailed assessments* include more detailed sampling and description of channel characteristics, including smaller channels (for further information consult FPC Channel Assessment Procedure Field Guidebook and Annex B on Riparian Assessments for references on procedures applicable to small streams - 1996).

Chemical pesticide: a synthetic chemical **pesticide** produced by a manufacturing process (FSC-AC , July 2004 and FSC-POL-30-601 FSC Chemical **Pesticide**s Policy July 2002-07); further elaborated in the BC context: chemical substances used to deliberately kill unwanted plants or other organisms; includes herbicides, insecticides, algicides, fungicides and rodenticides (see also **Pesticide** and **Highly hazardous pesticide)**.

Chemicals: The range of fertilizers, insecticides, fungicides, and hormones, which are used in **forest management** (FSC-AC 2004).

Coarse Woody Debris (CWD): Sound and rotting logs and large branches that have fallen or been cut and left in the forest, and that provide habitat for plants, animals, and insects and a source of nutrients for soil development (generally > 7.5 cm in diameter).

Compaction: An increase in the bulk density (mass per unit volume) and a decrease in soil porosity resulting from applied loads, vibration or pressure. It is undesirable for plant growth since the compacted soil has insufficient pore space to allow effective diffusion of gases and liquids necessary to permit or maintain root development and nutrient uptake in plants.

Compatible with natural disturbance regimes, patterns or the range of natural variability: Sufficiently similar in function, frequency, intensity, spatial extent and degree of heterogeneity to natural disturbances (e.g., those caused by fire or wind), to result in similar **ecosystem** characteristics and landscape patterns to those that result from natural disturbances; management strategies include a range of practices that represent a significant portion of the **range of natural variability** centered on the estimated mean or median condition (i.e. do not focus on strategies on either end of the range; landscape and/or regional seral stage distributions or amounts of old and mature forests are maintained within 2 standard errors of mean natural levels or +/- 25% of estimated mean when data are lacking); avoid doing the same thing everywhere all the time (e.g., high stand level retention in some areas, moderate and low in others, wildlife tree patches in some areas, single tree retention in others); management strategies do not include practices that attempt to mimic extreme events of low frequency (e.g., massive fires or hurricanes), as disturbance events of that magnitude will continue naturally and their frequency is likely beyond most planning horizons; where practices are outside the **range of natural variability**, there are mitigating factors that ensure the maintenance of **ecological integrity** in the broader context (see also *FSC BC Guidance– A companion document to the FSC Regional Standards for BC* – Guidance on Applying **RONV** to Forest Management).

Communities within, or adjacent to, the forest management area: see **local**.

Conflict: A situation where compliance with the law would preclude compliance with the FSC-BC Regional Standards or vice versa. The mere fact that the FSC-BC Regional Standards are more stringent than existing law does not by itself imply that there is a **conflict** for the purpose of Criterion 1.4.

Connectivity: The degree to which different habitat patches or environments are linked by single or multiple corridors of vegetation that provide habitat suitable for dispersal or seasonal movement of particular species, or the migration of **ecosystems** in response to long-term environmental change; conditions necessary for **connectivity** and its effectiveness will depend on the specific purpose of the **connectivity** and the requirements of species or **ecosystems** considered.

Conservation attributes: For the purpose of the FSC-BC Regional Standard a conservation attribute is an element, structure or process associated with a High Conservation Value, that can be monitored and managed to ensure its persistence over time. For example, if the HCV designation within a **management unit** is a consumptive watershed, the associated **conservation attributes** might include water quality and quantity, flow regimes, integrity of water courses and condition of seeps and springs. These **conservation attributes** would be identified during the **HCVF** assessment and management strategies to maintain and/or enhance them would be developed, implemented and monitored as appropriate.

Consulting with the First Nation: For purposes of FSC-BC, characteristics of a good consultation process include:

- The consultation process is designed with **First Nation**s' and is agreed to by both forest **manager** and **First Nation**.
- The **management plan** is developed with the **First Nation(s)** communities.
- The **First Nation(s)** are satisfied the schedule of consultation is sufficient to provide them with effective involvement in the development and monitoring of the plan.
- The **First Nation(s)** are satisfied their concerns have been appropriately recorded (e.g., in writing, maps, videos) and have been incorporated in the **management plan** as required.
- **First Nation(s)** identify the **resources and tenure rights** and the **sites of special cultural, ecological, economic, or religious significance** they require to be protected and indicate their locations on maps where appropriate.
- The extent to which proposed management activities may threaten or diminish the **resources and tenure rights**, or impact **sites of special significance** of the **First Nation(s)** is assessed to the satisfaction of the **First Nation(s)**.
- Strategies are developed and implemented to maintain the **resources and tenure rights** and to protect **sites of special significance** of the **First Nation(s)**.
- The **First Nation(s)** are satisfied the strategies are sufficient to avoid threatening or diminishing their **resources and tenure rights** and to protect their **sites of special significance**.
- In the case of an unanticipated threat or diminishment to resources or **tenure** rights or **sites of special significance** due to management activities, the **First Nation(s)** are satisfied appropriate measures are taken to maintain those resources or **tenure** rights (e.g., stop work, notification, assessment, mapping).
- Financial, technical or logistical capacity-building support, in proportion to the scale and intensity of operations, is available to the **First Nation(s)** where required to assist with consultation.

See also **Joint management agreement**.

Criterion (pl. Criteria): A means of judging whether or not a Principle (of Forest Management) has been fulfilled; "a category of conditions or processes by which forest management can be assessed: a criterion is characterized by a set of related indicators which are monitored periodically;"[adapted from The Montreal Process]. (FSC-AC, July 2004).

Critical habitat: An **ecosystem** or particular **ecosystem** element occupied or used by a species, or **local** population, that is necessary for their maintenance and/or long-term persistence, and where appropriate, recovery of a species or population. Habitat protection and management focuses efforts on maintaining or restoring suitability of the highest capability areas, while also ensuring an adequate supply of suitable habitat from other areas, when high capability areas are not in a suitable state.

Customary rights: Rights which result from a long series of habitual or customary actions, constantly repeated, which have by such repetition and by uninterrupted acquiescence, acquired the force of a law within a geographical or sociological unit (FSC-AC, July 2004).

Cutblock area: the gross area of an individual harvesting unit with defined boundaries, including: the net area to be reforested (NAR), areas of aggregated and dispersed retention and permanent access structures within the harvesting unit (excluding rock, wetland or other areas that in their natural state are non-forested **ecosystems**); aggregate **cutblock area** for the purposes of applying Indicator 6.3.8 is the combined **cutblock area**s of two or more nearby cutblocks that are < 100 ha individually (i.e. the minimum retention levels are met within the aggregated **cutblock area**, but not necessarily within each individual cutblock).

Database: An organized collection of related information.

Delegate control: In most cases, **First Nation**s are not the primary initiators or actors in forestry. Therefore, there will usually be an element of delegating control of forestry to a forest **manager** in FSC-certified operations. Implicit in the concept of **free and informed consent** in this context is the right to set conditions for delegation of control. Conditional delegated control means specific conditions for granting, withholding, or withdrawing consent for delegation of control are set. The conditions could also set benchmarks to be met by the forest **manager**. Those with authority to **delegate control** retain the right to revoke the delegation. **Indigenous peoples**' right to **delegate control** in the manner of their choosing is one of the "**legal and customary rights**" referred to in Principle 3. (See also "**free and informed consent**", and "**legal and customary rights**", FSC-BC Glossary)

Detailed terrain assessments: site specific assessments generally focused on terrain hazards related to individual road segments or cutblocks involving intensive ground checking; includes a FPC Terrain Stability Field Assessment (TSFA) and other related assessments where required (e.g., waterborne erosion hazards along ditchlines, highly detailed mapping of terrain features, stability or erosion hazards related to gentle over steep situations, the **likelihood of landslides** reaching areas of human habitation); (See also **Hydrologic assessment**s – the two may be combined when appropriate, and see FPC Mapping and Assessing Terrain Stability Guidebook 1999.)

Detrimental Soil Disturbance: Soil degradation; any change in physical, chemical or biological properties of the soil, including the organic forest floor or the mineral soil extending from the surface to the depth at which the unweathered parent material is encountered, that reduces soil fertility or forest productivity and/or results in adverse impacts on other **ecosystem** components (e.g., **compaction**, puddling, surface soil displacement, pH changes). This does NOT include *non-**detrimental*** **soil disturbance** (i.e. soil disturbance that does not result in productivity losses or other negative environmental impacts – e.g. drag scarification or micro mounding), and it does NOT include fully rehabilitated disturbance (e.g., rehabilitated temporary roads or fire guards). Methodology for determining sensitivity to such changes and their recognition can be found in the FPC Guidebooks for Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes 1999, Soil Conservation 2001, Soil Conservation Surveys 2001 and Soil Rehabilitation 1997.

Directly affected persons: Groups or people (both women and men) who:

- consider themselves directly affected by the proposed and current operations;
- reside in **communities within or adjacent to the management unit**; or,
- have legal or **customary rights** in the **management unit**.

Dispute: A **dispute** exists when the parties have exhausted consultative avenues to resolve their differences and the following occurs:

- a person or persons whose rights or interests are directly affected by the forest **manager**'s activities gives written notice to the **manager**, indicating that they wish to pursue a **dispute** resolution process and specifying:
    - which rights or interests are affected,
    - by which management activities,
    - in which location, and
    - what modifications are considered appropriate to avoid or mitigate impacts on the rights or interests;

  OR,
- the **manager** gives written notice to the disputant, in order to trigger the **dispute** resolution process and bring closure to the disagreement.

Dynamic Reserves: Mapped and designated areas of the reserve network, within **NDT** 3 or 4, where, if suitable replacement areas are available, management objectives include the application of treatments that mimic stand-replacing natural disturbance events and/or stand maintaining fires. In areas of frequent stand-replacement disturbances, these are areas managed on extended rotations with special measures taken to ensure harvesting, regeneration and stand development mimic natural processes as closely as possible. Where forest harvesting is utilized to mimic a stand-replacing disturbance, the frequency of the harvesting (i.e. rotation) is at least 1.2 times the estimated mean return interval of the disturbance, and stand level retention is similar in quality and distribution to the disturbance (i.e. post-harvesting ~ post-natural disturbance), but significantly higher in quantity than the estimated mean for the natural disturbance (i.e. upper end of **RONV**). Restocking is limited to natural regeneration, and where required to meet ecological objectives, fill-planting. Silvicultural systems utilized to mimic frequent low intensity fires and/or reduce fuel loading in areas with fire-maintained **ecosystems**, retain stand level habitat elements similar to those retained with natural fire regimes, and include the use of controlled burning wherever possible. Within **dynamic reserve** areas, only stands with an age of at least 80% of the estimated natural return interval for stand replacing events contribute to meeting the minimum protected reserve area requirements. **Dynamic reserve** areas less than that age are designated **dynamic reserve** replacement areas. (See also **Protected reserves**).

Ecological integrity: See **ecosystem integrity**.

Ecoregion: See **Ecoregional classification system**

Ecoregional Classification System: A system used to stratify BC's terrestrial and marine **ecosystem** complexity into discrete geographical units at five levels. The two highest levels, Ecodomains and Ecodivisions, are very broad and place British Columbia globally. The three lowest levels, Ecoprovinces, **Ecoregions** and **Ecosections** are progressively more detailed and narrow in scope and relate segments of the province to one another. They describe areas of similar climate, physiography, oceanography, hydrology, vegetation and wildlife potential. An **ecoregion** is an area with major physiographic and minor macroclimatic or oceanographic variation. There are 43 **ecoregions** in BC, of which 39 are terrestrial. An **ecosection** is an area with minor physiographic and macroclimatic or oceanographic variation and similar climate, physiography, oceanography, hydrology, vegetation and wildlife potential. There are 114 **ecosections** in BC varying from pure marine units to pure terrestrial units. **Ecosections** are meant to be mapped at small scales (1:250,000) for resource emphasis and area planning (See also http://srmwww.gov.bc.ca/rib/wis/eco/).

Ecosection: See **Ecoregional classification system**

Ecosystem: A community of all plants and animals and their physical environment, functioning together as an interdependent unit (FSC-AC, July 2004).

Ecosystem function, ecosystem functioning: Biotic or abiotic process that provides for the integration or interaction of various **ecosystem** components, the flow of nutrients or energy amongst those components, or otherwise causes changes through space and time.

Ecosystem integrity: The diversity of organisms at all levels, including genetic variation, species, populations, **ecosystems**, landscapes and their physical environments; the ecological patterns, structural attributes, functions and processes that are responsible for that **biological diversity** and also responsible for **ecosystem** resilience, allowing for recovery following disturbance.

Ecosystem services: The conditions and processes through which natural **ecosystems** provide life-support functions, such as cleansing, recycling, renewal and moderation (e.g., water purification and supply, climate regulation, carbon storage, slope stability, flood control, avalanche control).

Employee: An individual for whom any of the following apply:

- a staff member of the entity seeking certification;
- one who draws a salary from the entity seeking certification;
- one who is on the payroll of the entity, either in a full-time, part-time, or seasonal capacity; and/or,
- one for whom the entity withholds and remits income taxes in accordance with national and provincial laws.

Endangered species: Any species which is in danger of extinction throughout all or a significant portion of its range (FSC-AC, July 2004). In the BC context this term has a more specific meaning (See BC Conservation Data Centre (CDC) at http://srmwww.gov.bc.ca/cdc/ or COSEWIC at http://www.cosewic.gc.ca/).

Enduring feature: Biophysical land classification unit based on broad scale landforms, soils and vegetation zonation.

Environmental risk assessment: An estimate of the likelihood or probability of an adverse impact on the environment resulting from human activities (e.g., see *FSC BC Guidance– A companion document to the FSC Regional Standards for BC* – Guidance on **Environmental Risk Assessment**).

Equivalent clearcut area (ECA): An index of potential watershed level hydrologic impacts (e.g., increased peak runoff) due to forest cover removal, normally expressed as a percentage of the naturally forested area of a watershed; areas where forest cover has been completely removed by harvesting, fire or other disturbances are assessed as full percentages (e.g. clearcuts, intensive burns), areas with partial stand removal are pro-rated according to the percentage of the crown cover removed (i.e. equivalent to clearcut); areas partially recovered through forest regeneration are pro-rated according to the degree of crown closure and height of the regeneration; unweighted ECA is the resulting percentage of area in a non-hydrologically greened-up state; weighted ECA is calculated by adding the percentage ECA below the **H60 line** to 1.5 times the percentage for the area above the **H60 line** (the area with greatest potential to increase peak flows); the **H60 line** is the elevation at which a watershed's area is split into 60% of the area above and 40% below.

Exotic species: An introduced species not native or endemic to the area in question (FSC-AC, July 2004).

First Nation(s) (see **Indigenous Peoples)**

Focal Species: Focal species have been defined in a number of different ways. Most generically, they are species that are the subject of focus, for any of a wide variety of conservation reasons. In BC these typically include species listed as Identified Wildlife, or other species of interest. More specifically, **Focal Species** have been defined as a group of species that together provide a useful tool for determining minimum thresholds appropriate to a particular landscape at multiple spatial scales (Lambeck 1997); suitable **focal species** are the most sensitive in one of four categories:

- area-limited (e.g. umbrella species)
- dispersal limited
- resource-limited, and
- process-limited.

Forest integrity: The composition, dynamics, functions and structural attributes of a **natural forest** (FSC-AC, July 2004); in the BC context see also the definition of **Ecosystem integrity**.

Forest management/manager: The people responsible for the operational management of the forest resource and of the enterprise, as well as the management system and structure, and the planning and field operations (FSC-AC, July 2004). In the BC context, see "**manager**."

Forest management unit (FMU): a clearly defined forest area with mapped boundaries, managed by a single **manager**ial body to a set of explicit objectives which are expressed in a self-contained multiyear **management plan** (FSC-AC, July 2004; in the BC context see **management unit**).

Examples of **forest management unit**s: An FMU may be a community managed forest; a privately owned estate incorporating several blocks of woodland that are managed within an consolidated **management plan**; a management subdivision of a national forest service covered by a consolidated **management plan**; the forest of a region or country consisting of many independent forest owners would not be an FMU (because it is not managed by a single, recognised **manager**ial body according to a self-contained, multi-year **management plan**); The regional subdivision of a national forest service could be an FMU if it is managed according to a set of explicit objectives expressed in a self-contained multi-year **management plan**.

NOTE 1: A single, large FMU may be divided into several smaller FMUs by the development of independent **management plan**s for each of the smaller areas. Conversely, several smaller FMUs may be consolidated to create a single, large FMU if the **management plan**s are integrated into a single plan covering the whole area and managed by the same managerial body.
NOTE 2: It is not a requirement that all the forest area within an FMU be contiguous. An FMU may consist of a number of separate sites or blocks of forest.

Forest workers: Employees of the **manager**, and **employees** of contractors and subcontractors retained by the **manager**, who are involved in work associated with the **manager**'s operations on the **management unit** (e.g., operations including forest management, forest harvesting, timber sales, timber marketing, etc.). **Local** is considered equivalent to "**communities within, or adjacent to, the forest management area**" (as in Criterion 4.1).

Former plantations – See Other forest types

Free and informed consent: *Consent* has with two aspects to it: the consent must be *freely given*, and it must be *knowledgeably given*. Consent itself means to express willingness; to give permission; to agree. It also means a voluntary agreement; a permission. *Freely given consent* is consent that is voluntarily given, without manipulation, undue influence or coercion. Key to "freely given consent" is maintaining the essential dignity and individual/community's right to choose. *Informed consent* involves explicitly informing a participant in the process, its potential benefits and risks, the alternatives to participating, and the right to withdraw from the process at any time. Key to "informed consent" is the quality, timeliness and appropriateness of information used to decide consent. Implicit in the right of **free and informed consent** in this context is the right to set specific conditions for granting, withholding, or withdrawing consent. The conditions could also set benchmarks to be met by the forest **manager**. **Indigenous peoples**' right to grant, withhold or withdraw consent is one of the "**legal and customary rights**" referred to in Principle 3. (See also **delegate control**, and **legal and customary rights**).

Free and informed consent from local rights holders: For the purposes of Criterion 2.2, **free and informed consent** is considered given by **local rights holder(s)** where: a) **local rights holders** have participated in a public participation process under Criterion 4.4 that accommodates their needs/preferences with regard to scope and design (as demonstrated by lack of **disputes** regarding the process from **local rights holders**); and, b) having been informed of the opportunity to do so, no **local rights holder** has given written notice to the **manager** that they **dispute** that proposed management will protect their rights or resources.

Genetically modified organisms: Biological organisms which have been induced by various means to consist of genetic structural changes (FSC-AC, July 2004). In the BC context this is interpreted to be: organisms that result from the introduction, removal or suppression of genetic material through artificial means (e.g., bacterial vector, mechanical).

Grievance notice: Notification provided to the **manager**, in writing, by a **local** person or people regarding actual or potential loss or damage affecting their property, resources, livelihoods, or legal or **customary rights**, resulting from the **manager's** activities.

Grievance involving potential loss or damage: A grievance where there is evidence that proposed or ongoing forestry activities are likely to cause loss or damage to the rights, property, resources or livelihoods of a **local** person or people.

Grievor: A person who provides a **grievance notice** to the **manager**.

H_{60} line: See **equivalent clearcut area.**

HCVF: See **High Conservation Value Forests**

High Conservation Value Forest (HCVF): High Conservation Value Forests are those that possess one or more of the following attributes (The main points in bold below are the FSC International 2004 definition; details for application in the BC context are shown as subpoints; see Appendix D for information on the assessment of HCVFs):

1. **Forest areas containing globally, regionally or nationally significant: concentrations of biodiversity values (e.g. endemism, endangered species, refugia); and/or large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance**.
    - 1.1 Forest areas that include the **critical habitats** of globally, nationally or provincially **threatened species**.
    - 1.2 Forest areas that include the **critical habitats** of endemic species.
    - 1.3 Forest areas that support: unusually high naturally occurring species diversity, migratory concentrations of species or individuals, or other rare ecological or evolutionary phenomena.
    - 1.4 Large forest areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance (see Appendix D for assessment of "large").
    - 1.5 Forest areas associated with high-value fish habitat and other critical aquatic habitat.
2. **Forest areas that are in or contain rare, threatened or endangered ecosystems**.
    - 2.1 Forests designated as threatened or endangered at global, continental or national levels (e.g. **Ecoregions** or large forests designated as critical, endangered or vulnerable by WWF, WRI or Global Forest Watch).
    - 2.2 Plant communities designated as endangered or threatened (Red List) or vulnerable (Blue List) by the BC Conservation Data Centre.
    - 2.3 Forest areas containing mature and old forest where those age classes are becoming rare due to human activities.
    - 2.4 Forest areas that are under-represented in protected areas.

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

   3.1 Where downslope or downstream consequences of landslides, sediment production or snow avalanches are significant (e.g., spawning habitat, transportation or communication infrastructure), forest areas associated with unstable terrain (Class IV, V), highly erodible soils or snow avalanche starting zones.

   3.2 Forest areas on the **management unit** that protect the water supply of the community and individual water users identified through licensing data and consultation.

   3.3 Forests required for maintenance of flow regimes and/or flood prevention in other critical watersheds (e.g., riparian stands, forest stands above the H60 line in snowmelt-dominated watersheds).

4. **Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities)**.

   4.1 Forest areas that are the direct source of a significant portion of the **local** community's food supply identified through consultation.

   4.2 Forest areas that are the direct source a significant portion of materials used directly for community or ceremonial purposes by the **local** community, as identified through consultation (e.g., wood, skins, other non-food materials).

   4.3 Forest areas that are of cultural, religious or spiritual significance for the **local** community, or otherwise critical to its traditional cultural identity identified through consultation.

High grading: A logging operation in which only the higher value trees (based on species, size and quality) are removed from the stand, with no consideration for the quality of the remaining trees left behind, often felled but unused (Dunster & Dunster, 1996).

Highly hazardous pesticide: chemical **pesticide**s that have been identified in policy documents by FSC-AC as generally prohibited for use on FSC certified **management unit**s in FSC International Policy FSC-IP 0001 (Revised and Approved July 2002) (see Appendix C for a list of **highly hazardous pesticide**s and also **pesticide** and **chemical pesticide**).

Hydrologic assessment: An evaluation of water-related aspects of the environment, usually related to environmental risk or impacts resulting from past or proposed management activities; at the *watershed level* usually includes watershed and sub-basin delineation, mapping of **hydrologic features**, stream classification and evaluation of **equivalent clearcut area (ECA)**, road density, sediment sources and reconnaissance channel morphology; *detailed assessments* are site specific assessments relating to specific road segments or cutblocks (e.g., potential for diversion of surface and/or subsurface drainage, increase ECA over unstable terrain or downstream hydrologic impacts in areas of human habitation), or stream reaches (stream crossings, culvert size or flooding potential). Stream classification as part of a watershed level assessment may be based on airphoto interpretation or predictive models, while detailed assessments require field classification (See also **Detailed terrain assessment** – the two may be combined when appropriate).

Hydrologic Features: Water-related features visible at the land surface, such as stream channels, lakes, springs, seepage zones and wetlands.

Indigenous lands and territories: The total environment of the lands, air, water, sea, sea-ice, flora and fauna, and other resources which **indigenous peoples** have traditionally owned or otherwise occupied or used. (Draft Declaration of the Rights of **Indigenous peoples**: Part VI) (FSC-AC, July 2004).

Indigenous peoples: "The existing descendants of the peoples who inhabited the present territory of a country wholly or partially at the time when persons of a different culture or ethnic origin arrived there from other parts of the world, overcame them and, by conquest, settlement, or other means reduced them to a non-dominant or colonial situation; who today live more in conformity with their particular social, economic and cultural customs and traditions than with the institutions of the country of which they now form a part, under State structure which incorporates mainly the national, social and cultural characteristics of other segments of the population which are predominant." (Working definition adopted by the UN Working Group on Indigenous Peoples - FSC-AC, July 2004). In the BC context **First Nation(s)** refers to **indigenous peoples**.

Integrated pest management (IPM): An ecological method of pest control that relies on a combination of operational approaches to reduce damage to the forest rather than to eliminate the pest. An important goal of IPM is to minimize environmental impact. IPM techniques may include the use of natural predators and parasites, genetically resistant hosts, environmental modifications, and when necessary and appropriate, **chemical pesticides**.

Integrated riparian assessment: a process for developing, implementing and monitoring a riparian management strategy; the process includes a series of interrelated assessments focussed on defining the role of various riparian areas in maintaining the **ecological integrity** of aquatic **ecosystems** in a specified r**iparian assessment unit** (e.g., a watershed); these assessments then form the basis for the development and implementation of a riparian management strategy, and a monitoring program for use within an adaptive management framework. (See also **Riparian assessment unit** and the Appendix B, Requirements for Riparian Management, for more information.).

Joint management agreement: In the FSC-BC context, a **joint management agreement** is an agreement made between a forest **manager** and a **First Nation(s)** with the purpose of going beyond consultation, and into jointly setting goals, objectives, strategies, implementation, restoration and monitoring of the forest within the **management unit**. This can range from a relatively few areas of common interest to a quite thorough integration of industry and **First Nation** ideas throughout the whole **management plan**. A **joint management agreement** is not a substitute for consultation on the **management plan**, but rather is an enhanced form of consultation.

For purposes of FSC-BC, characteristics of a good **joint management agreement** include:

- The agreement is written in clear and unambiguous language.
- The **joint management agreement** is approved by the decision-making body or bodies as set out in the protocol agreement.
- Financial, technical or logistical capacity-building support, in proportion to the scale and intensity of operations, is available to the **First Nation(s)** where required to assist with development of the **joint management agreement**.

The agreement contains at a minimum:

- protection measures described in Criteria 3.2, 3.3 and 3.4;
- collaboratively developed objectives and strategies related to matters of importance to the **First Nation(s)** (e.g., revenue sharing, access to resources, training and employment, habitat restoration, cedar management, **non-timber forest product** management strategies);

- a process for involving **First Nation(s)** in collaborative development of all or part of the **management plan**;
- an appropriate consultation process (e.g., similar to that outlined in **consulting with the First Nations**, this Glossary) for consulting on any part of the **management plan** not covered by collaborative development; and,
- provisions for reviewing the **joint management agreement** and its effectiveness, and for renewal of the agreement.

Lakeshore management zone: The portion of a riparian area located adjacent to a **Lakeshore Reserve Zone**, or directly adjacent to a lake where there is no **Lakeshore Reserve Zone**, where management activities are designed to maintain or restore riparian functions and/or maintain the integrity of adjacent **Lakeshore Reserve Zone**.

Lakeshore Reserve Zone: The portion of a riparian area located adjacent to a lake where road construction and forest harvesting are prohibited, except where required for restoration of riparian functions.

Lands, territories and resources: Is the same as the FSC definition of **Indigenous lands and territories**: "The total environment of the lands, air, water, sea, sea-ice, flora and fauna, and other resources which **indigenous peoples** have traditionally owned or otherwise occupied or used." (See FSC definition of **Indigenous lands and territories**).

In the BC context, where Treaty definitions or geographic interpretations of a **First Nation**'s **lands, territories and resources** do not exist, the default definitions used are the FSC-BC Glossary definitions and the geographic interpretations used are the **First Nation(s)**' interpretations. Where Treaty definitions or geographic interpretations of a **First Nation**'s **lands, territories and resources** do exist, the definitions or interpretations provided therein are used. (See Glossary definitions of "**Indigenous lands and territories**", "**resource and tenure rights**", and "**sites of special cultural, ecological, economic, or religious significance**").

Landscape: A geographical mosaic composed of interacting **ecosystems** resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area (FSC-AC, July 2004). In the BC context, see definition of **landscape level**.

Landscape level: At a spatial scale above a single plant community or forest stand and below a region (See also definition of **Landscape**). This term is used in the generic sense, and although similar, is *not* intended to be synonymous with "**Landscape Unit,"** a defined planning area under the *Forest Practices Code*, usually between 50,000 and 150,000 ha in size, with boundaries based primarily on topographic or geographic features such as a watershed or group of watersheds.

Landscape Unit - See **Landscape level**

Legal and customary rights: In the BC context, **legal and customary rights** means **Aboriginal Rights and Title,** which are largely self-defined by non-treaty **First Nation**s, or Treaty Rights, which are mutually defined by **First Nation** and Federal Government at the time the treaty is settled.

Principle 3 and its four Criteria identify rights which specifically relate to FSC certification and which are protected at the Principle and Criterion levels. These rights, which may be modified by existing or future treaties, are:

- the right to "own, use and manage their **lands, territories and resources**";
- the right to "control **forest management** on their lands and territories";
- the right to identify their own "**lands, territories and resources**";
- the right to freely and knowledgeably grant, withhold or withdraw consent for **forest management** within their lands and territories;
- the right to **delegate control** for **forest management** and revoke that delegation; and
- the right to protection or accommodation of resource and **tenure** rights, **sites of special significance**, and use of intellectual property.

See also "**Aboriginal Rights and Title**", "**free and informed consent**", "**lands, territories and resources**", and "**delegate control**" – FSC-BC Glossary.

Legal or customary tenure or use rights: In the BC context and for the purposes of Criterion 2.2, **legal or customary tenure or use rights** include, but are not limited to the following:

- guide outfitters licences/certificates;
- angling guide licences;
- registered traplines and trapping licences;
- easements and covenants;
- public and private rights of way;
- statutory **tenure**s (e.g., licences, permits etc. under the *Land Act*, *Mineral Tenure Act*, *Range Act*, *Forest Act*);
- customarily or legally permitted uses of Crown land for gathering of **non-timber forest products**, hunting, fishing etc.;
- customarily or legally permitted uses of private land;
- rights or obligations related to construction, rehabilitation or maintenance of trails or other recreation facilities;
- rights to use public footpaths or roads (e.g. to access to well known landmarks, features or viewpoints);
- water use (licenced and unlicensed);
- common law rights of riparian owners; and,
- stream stewardship rights and obligations (by contract or pursuant to approvals, licences etc. under the *Water Act*).

Likelihood of landslides or landslide initiation: The likelihood that a landslide may occur. The BC FPC defines two kinds of **terrain stability mapping**: detailed and reconnaissance. Detailed mapping involves a five class terrain stability classification based on relative **likelihood of landslide initiation** (I – insignificant, II – very low, III – low, IV – moderate, V – high). Reconnaissance mapping involves a three class system (S – negligible likelihood roughly equivalent to detailed classes I – III, P - Potentially Unstable roughly equivalent to class IV, and U – Unstable roughly equivalent to class V). The FPC classes are defined according to the likelihood that a landslide(s) may occur following *conventional* timber harvesting (clearcutting) or road construction (sidecasting). (See also definitions of **Terrain mapping** and **Terrain stability mapping**, and FPC Mapping and Assessing Terrain Stability Guidebook 1999.).

Live wildlife tree: A live tree that provides **critical habitat** for wildlife; generally refers to trees with defects that produce habitats not present in healthy vigorously growing trees (e.g., mistletoe brooms, hollow cavities, forks).

Local: People are considered **local** where they permanently reside within daily commuting distance by car or boat from the **management unit**, or where they are part of the **First Nation** whose lands and territories contain or are contained within the **management unit**. "**Communities within, or adjacent to, the forest management area**" (as in Criterion 4.1) are considered equivalent to **local**.

Local laws: Includes all legal norms given by organisms of government whose jurisdiction is less than the national level, such as departmental, municipal and customary norms (FSC-AC, July 2004).

Local provenance: tree seed and seedlings that are in accordance with the limitations on seed transfer as set out in the "Chief Forester's Standards for Seed Use" (November 20, 2004 and April 1, 2005); a copy of the standards can be obtained at: http://www.for.gov.bc.ca/code/cfstandards/

Local rights holder: A person who resides within or adjacent to the **management unit** and holds **legal or customary tenure or use rights** in the **management unit**.

Long term: The time-scale of the forest owner or **manager** as manifested by the objectives of the **management plan**, the rate of harvesting, and the commitment to maintain permanent forest cover. The length of time involved will vary according to the context and ecological conditions, and will be a function of how long it takes a given **ecosystem** to recover its natural structure and composition following harvesting or disturbance, or to produce mature or primary conditions (FSC-AC, July 2004).

Machine-free zones: designated areas where tracks and wheels of ground-based equipment are prohibited.

Management plan: The **management plan** as required under Principle 7 of these standards.

Management Unit: In BC Provincial forests, at a minimum the **management unit** contains the entire geographically defined legal or administrative area associated with a given **tenure** (e.g., Schedule A and B lands set out in a Tree Farm Licence; all chart/operating areas associated with a Forest Licence); or, in the case of a certification involving all **tenure** holders in a Timber Supply Area, Innovative Forest Practices Agreement management area or similar legally recognized area, the full extent of that legally recognized area constitutes the **management unit** (see also **Forest management unit**).

Manager: The **manager** is the individual or legal entity that appears on the title documents for the land being certified, or on the relevant **tenure**/lease, and who ultimately has responsibility for ensuring the FSC-BC Regional Standards are met. However, because the way companies organize themselves differs, any given use of the word "**manager**" in the Standards is to be taken to refer to the individual or division of the title/**tenure** holder who has responsibility for the matter in question.

Marine shore management zone: The portion of a marine shore riparian area located adjacent to a **marine shore reserve zone**, or directly adjacent to a marine shore where there is no **marine shore reserve zone**, where management activities are designed to maintain or restore marine shore **ecosystem functions** and/or maintain the integrity of an adjacent **marine shore reserve zone**.

Marine shore reserve zone: The portion of a marine shore riparian area located adjacent to a marine shore where road construction and forest harvesting are prohibited, except where required for restoration of marine shore riparian functions.

Native species: A species that occurs naturally in the region; endemic to the area (FSC-AC, July 2004).

Natural cycles: Nutrient and mineral cycling as a result of interactions between soils, water, plants, and animals in forest environments that affect the ecological productivity of a given site (FSC-AC, July 2004).

Natural Disturbance Regime (NDT): an area that is characterized by a broadly homogeneous **natural disturbance regime** and **range of natural variability**; in BC the five **NDT**s listed below are defined by the FPC **Biodiversity** Guidebook 1995 (for further information see the Guidebook and also **range of natural variability** and **compatible with natural disturbance regimes**).

NDT 1 – Landscapes with rare stand-replacing events.

NDT 2 – Landscapes with infrequent stand-replacing events.

NDT 3 – Landscapes with frequent stand-replacing events.

NDT 4 – Landscapes with very frequent stand-maintaining fires.

NDT 5 – Alpine tundra and subalpine parkland landscapes.

Natural Forest: Forest areas where many of the principal characteristics and key elements of native **ecosystems** such as complexity, structure and diversity are present, as defined by FSC approved national and regional standards of **forest management** (FSC-AC, July 2004).
In the BC context, these areas are designated as a "**well-managed natural forest" –** an area with **natural forest** characteristics and a management regime that meet the requirements of Criteria 6.3 and/or 6.4 (See also definitions of **Other forest types**, **Plantation** and **Restoration area**).

Non-timber forest products: All forest products except timber, including other materials obtained from trees such as resins and leaves, as well as any other plant and animal products (FSC-AC, July 2004). In the BC context, this includes: fungi, lichens, flowers, seeds, roots, bark, leaves and other vegetation (or portion thereof), forest recreation, visual resources, and water, fish and wildlife utilized for human consumption. Wood or wood fibre is not included, although products that can be harvested from trees without tree mortality are included (e.g., harvesting of boughs, cedar bark or cones).

Other forest types: Forest areas that do not fit the criteria for **plantation** or **natural forest**s and which are defined more specifically by FSC-approved national and regional standards of forest stewardship (FSC-AC, July 2004). In the BC context three "**other forest types**" are recognized (See also definitions for **Natural forest**, **Plantation** and **Restoration area**):

a) **Poorly managed natural forest**: an area with sufficient alteration of **natural forest** characteristics and a history of past management practices such that neither the area nor the management regime meet the requirements of Criterion 6.3, but neither sufficient alteration of natural stand characteristics and/or a sufficiently aggressive management regime to be classified as a **plantation**; not acceptable for FSC certification without alteration of the management regime and designation as a **restoration area**.

b) **Former plantations (**undergoing restoration): an area having present stand characteristics and past management practices consistent with a **plantation** management regime; the present and future management regime includes measures to restore and maintain the area as a **natural forest** that meets the requirements of Criteria 6.3.

c) **Possible future plantation conversion**: an area with present characteristics of a **natural forest**, but with plans to implement a **plantation** management regime; conversion of these areas will be required to meet Criterion 6.10 and Principle 10.

Outstanding Dispute: A **dispute** is outstanding when a resolution to the **dispute** has not been achieved through a process as described in **Indicators 2.3.1 or 4.4.4.**

Pesticide: (including fungicide and herbicide): any substance, preparation or organism prepared or used in protecting plants or wood or other plant products from harmful organisms; in rendering such organisms harmless; and controlling organisms with harmful or unwanted effects. [The term **pesticide** is used here (instead of e.g. biocide) because (1) it is used in the FSC P&C and (2) the term biocide has other legal definitions and restrictions, and includes some household cleansing products.] (FSC-AC, July 2004, see also **Chemical pesticide** and **Highly hazardous pesticide**).

Plan for ongoing public participation: For the purposes of Criteria 2.2 and 4.4, a **plan for ongoing public participation** outlines the following aspects of an ongoing public participation process regarding the **manager**'s **forest management** activities/issues relevant to FSC certification of the **management unit**, to the extent requested by **directly affected persons** and in a manner **appropriate to the scale and intensity** of operations: a) scope and objectives of the process; b) mechanisms for contacting **directly affected persons** and effectively communicating with them (e.g., accommodating language or other barriers to participating); c) forms of consultation (e.g., public advisory group, workshops, interactive website, one-on-one meetings); d) decision-making methodology; e) facilitation, technical support and record keeping; f) timelines that allow adequate time for response; g) roles, responsibilities and obligations of participants; h) provision for reasonable participant assistance where required to allow **directly affected persons** to participate; i) accountability for decisions; j) a process for reviewing and revising the **plan for ongoing public participation**; and, k) a list of participants.

Plantation: Forest areas lacking most of the principal characteristics and key elements of native **ecosystems** as defined by FSC-approved national and regional standards of forest stewardship, which result from the human activities of either planting, sowing or intensive silvicultural treatments (FSC-AC, July 2004).

In the BC context, **plantation**s are mapped and designated areas of the **management unit** that are planned to be managed over the **long term** under a **plantation** management regime. **Plantation** management regimes are characterized by:

1. a *set of stand characteristics* that are present and observable on site, as a result of past and/or current practices,
2. a long-term *management regime* to maintain or intensify those stand characteristics, and
3. an *intent* to manage for economic or tree growth objectives to the exclusion of others.

Recognition of **plantation** management regimes requires the presence of all three of the following diagnostic parameters:

1. A portion or portions of the **management unit** where at least two of the following stand level characteristics of forest **ecosystems** are maintained in a highly altered state or eliminated (e.g., reduced to <60% of estimated natural levels):

- tree species diversity (especially deciduous spp. and/or other non-commercial spp. with significance to **biodiversity**),
- stand diversity (e.g., patchiness, presence of small openings, variability in tree species diversity, density and/or canopy layers),
- stand structures and associated habitats resulting from pathogens or physical damage (e.g., forked stems, mistletoe platforms, hollow boles, dead tops),
- early **successional** habitats (e.g., berry patches for bears or browse for moose; brush and herbaceous species that provide nutrients and organic matter for soil fertility),
- presence of mature and old trees,
- snags (e.g., nesting and foraging areas for cavity nesters, woodpeckers and bats), or
- **coarse woody debris** (e.g., habitat for rodents and amphibians, organic matter, water storage, seedling substrate).

2. On that same portion(s) of the **management unit**, a long-term management regime that maintains highly altered **ecosystems** and regularly employs at least three of the following management practices and/or treatments:

- shortened rotation ages, often based on economic factors rather than natural disturbance patterns (e.g., an average rotation age <60% of the mean return interval for the dominant stand-replacing disturbance factor – e.g., fire, wind),
- sanitation treatments (e.g., salvage logging of damaged or infected trees, thinning to eliminate trees with poor form)
- even-aged/single-canopy layer management where multi-aged/multi-canopy layer stands are prevalent naturally
- broad scale brushing and/or weeding (e.g., broadcast herbicide treatments or non-specific brushing, does not include manual seedling-specific methods)
- stocking control (thinning or spacing, except where undertaken to meet defined habitat objectives),
- mechanical site preparation (e.g., push-over logging, mounding, scarification)
- fertilization, or
- pruning (except where undertaken to meet defined habitat objectives).

3. Management objectives for that same portion(s) of the **management unit** that:

- include wood fibre and/or timber production as the primary objective, AND
- do NOT include objective(s) to maintain or restore stand structural characteristics compatible with natural forest management as defined under Criterion 6.3.

Plantations in relation to the other possible types of forests in the **management unit** (See also definitions for **Natural forest**, **Other forest types** and **Restoration area**).

Forest management Types	Parameters 1 (>2 degraded ecosystem components)	2 (>3 intensive practices)	3 a) (wood/fibre as main objective)	3 b) (restoration objectives)
Plantation	Yes	Yes	Yes	No restoration objectives
Former Plantation Undergoing Restoration	Likely yes in the past and present, but there is evidence that restoration is occurring and that future conditions will meet requirements under Criterion 6.3.	Likely Yes in the past, but likely No in the present and future.	Likely No	Restoration objectives are present
Poorly Managed Natural Forest	Yes	Likely Yes	Yes or No	May be restoration objectives
Well Managed Natural Forest	No	Likely No	No	No need for restoration
Possible Future Plantation Conversion	Yes or No at present, Yes in the future.	Yes or No at present, Yes in the future.	Yes	No restoration objectives

Poorly managed natural forest – See **Other forest types**

Possible future plantation conversion – See **Other forest types**

Precautionary approach: Tool for the implementation of the precautionary principle (FSC-AC, July 2004). In the BC context, the **precautionary approach** is defined as follows: The forest **manager** will often be required to act with incomplete knowledge of cause and effect relationships, and therefore a **precautionary approach** includes the following:

- The **manager** avoids actions that may lead to irreversible changes to **ecosystem function** and resilience.
- Alternative management strategies are developed and evaluated, including the alternative of no management intervention, to identify alternatives that are least likely to impair the viability of the species or **ecosystem**.
- The onus is on the **manager** to demonstrate that proposed management activities are not likely to impair **ecosystem function** and resilience.
- When previously unanticipated threats to **ecosystem integrity** are identified or knowledge of **ecosystem** processes increases, the **manager** takes timely, efficient and effective corrective actions.
- The **manager** remains mindful of the needs of future generations.

Principle: An essential rule or element; in FSC's case, of forest stewardship (FSC-AC, July 2004).

Principles of conservation biology: in the context of protected reserve network planning, applicable concepts from conservation biology include: complete **ecosystem** representation, protection of core habitats to ensure the maintenance of viable populations of all **native species** in natural patterns of distribution and abundance, sustaining ecological and evolutionary processes and the maintenance of a landscape that is resilient to environmental change. Many conservation biology practitioners translate these principles into the need for a network of well-distributed **protected reserves**, combined with adequate buffers and linkage areas to provide for dispersal, seasonal movement and adaptation to environmental change. The required size and distribution of the reserve network depends on the **ecosystems** and species present, landscape complexity and the extent and intensity of human disturbance in the surrounding matrix.

Protected reserves: Mapped areas designated by the **manager** for long-term protection from development; harvesting and road building are generally prohibited in reserves, except where used as part of a restoration plan (e.g. fuel reduction in association with controlled burning in fire-maintained **ecosystems**), or to meet the objectives for specific reserves (e.g. fire control, removal of invasive species). Individual reserve units less than 5 ha in size or less than 4 tree heights wide do not meet the requirements of a reserve for biodiversity, unless it can be demonstrated they meet specific **landscape level** habitat objectives (e.g., generally not individual stand level retention wildlife tree patches). Where **dynamic reserves** are utilized within a protected reserve network, the **dynamic reserves** are located in areas dominated by younger stands with the highest frequency of stand-replacing disturbance events, while the permanent portions of the network are located in areas with a lower frequency of stand-replacing disturbances and where older stands are more prevalent (See also **Dynamic reserves** and *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on Planning).

Province: The responsible ministry/agency of the **Province** of British Columbia.

Qualified specialist(s): Individuals whose expertise qualifies them to carry out work (e.g. assessments, design of management practices, etc.) required by the FSC-BC Regional Standards, taking into consideration the following:

- professional ethics and independence;
- accountability;
- experience;
- training;
- formal qualifications;
- familiarity with the FSC-BC Regional Standards;
- familiarity with the **ecosystem** conditions and/or cultural/social factors relevant to the **management unit**; and,
- commitment to professional standards of research/field work.

Range of natural variability (RONV): The range of dynamic change in natural systems in the last 2000 years prior to the influence of European settlers; it includes consideration of the range of **ecosystem** conditions such as seral stage distribution, patch size distribution, stand structure and disturbance regimes (i.e., frequency, intensity, spatial extent and heterogeneity of disturbances); FSC-BC includes **First Nation**s' prehistoric management systems (e.g., burning) as an integral part of **RONV**; similar concepts include natural variability, historical range of variability, reference variability and reference **ecosystems** (See also *FSC BC Guidance* - Guidance on **Range of natural variability** and a Planning Approach to Meeting the FSC-BC Regional Certification Standards).

Recognizes and respects, recognized and respected: From the Oxford Concise Dictionary of Current English, 1995, to recognize [a legal or customary right of **First Nation**s] is to acknowledge the existence, validity, character, or claims of that right. To respect that right contains two aspects: a) to avoid interfering with, harming, degrading, insulting, injuring or interrupting; and b) to treat with consideration, to heed or regard.

For purposes of FSC-BC, a legal and customary right is considered to have been **recognized and respected** when its existence has been acknowledged and damage to it or interference with it avoided, accommodated or compensated.

Resources and tenure rights: Include, but are not limited to the following:

- water, including community watersheds;
- fisheries, including fish habitat;
- **non-timber forest products**;
- access routes to resources, including trails and culturally modified trees (CMTs);
- trap-lines, traditional or contemporary;
- guiding operations;
- cultural tourism;
- hunting areas, including wildlife habitat;
- gathering areas such as food, artisan materials**;**
- culturally-specific resources such as cedar for coastal cultures;
- Tribal Heritage Parks;
- timber and forestry areas;
- subsurface areas, such as mineral and oil deposits; and
- traditional land management, including intentional burning to enhance berry and wildlife habitat production.

Restoration areas: Mapped areas of **poorly managed natural forest**s or **former plantations** that have been designated by the **manager** for restoration to **natural forest**s that meet the requirements of Criteria 6.3 and/or 6.4; areas that have management objectives to restore **natural forest** characteristics within a timeframe appropriate to the characteristics being restored; and that have restoration activities occurring on the ground to meet those objectives (See also **Other forest types**).

Riparian assessment unit: the area within which a single **integrated riparian assessment** is completed, and on which the riparian reserve and management area budgets are applied; for most stream- and river-based assessments the assessment unit would be a watershed or group of watersheds (e.g., a face unit); for plateaus or coastal plains, a **Landscape Unit** or a BEC **variant** within an **ecosection** may be more appropriate (See also **Integrated riparian assessment** and the Riparian Assessment Annex P6a, Requirements for Riparian Management, for more information).

Riparian classification: Classification of streams, lakes and wetlands based on various characteristics; for the purposes of the FSC-BC Standards classification, includes factors such as fish presence, stream channel width, domestic water licence presence, distance upstream from fish-bearing areas, wetland size, lake size.

Riparian management area: The portion of a riparian area of influence that includes the **riparian reserve zone** and the **riparian management zone**.

Riparian management zone: The portion of a riparian area located adjacent to a **riparian reserve zone**, or directly adjacent to a stream or wetland, where management activities are designed to maintain or restore riparian functions and/or maintain the integrity of adjacent **riparian reserve zones**.

Riparian reserve zone: The portion of a riparian area located adjacent to a stream or wetland where road construction and forest harvesting are prohibited, except where required for stream crossings or restoration of riparian functions.

Significant non-compliance: Non-compliance is significant either:

- when it results in or is likely to result in an adverse change from existing conditions that affects persons or the environment; or,
- because of factors such as:
    - the magnitude of the non-compliance event or conditions created;
    - the frequency of the non-compliance;
    - a high degree of concern from employees or the public;
    - the deliberateness (or intentionality) of the non-compliance;
    - the sensitivity of the values involved; or,
    - where non-compliance inhibits the ability of the public to provide meaningful input on proposed forest management.

Silviculture: The art of producing and tending a forest by manipulating its establishment, composition and growth to best fulfill the objectives of the owner. This may, or may not, include timber production (FSC-AC, July 2004).

Site series: See **Biogeoclimatic Ecosystem Classification (BEC)**.

Sites of special significance (including cultural, ecological, economic, or religious significance): Include, but are not limited to, sites relating to or associated with the following:

- Ceremonial/Spiritual/Religious (e.g. vision/spirit quest area repository for the dead, gathering place, sacred places);
- Traditional Oral History (e.g. origin story, legend);
- Cultural Landforms (e.g. named places, marker sites, legendary landforms);
- Supernatural Beings (e.g. supernatural areas);
- Transportation (e.g. grease trail, trading route, water route, portage area);
- Habitation (e.g. permanent village, seasonal residence, storage area);
- Recreational (e.g. gathering place, games or competition place);
- Cross-Cultural Interaction (e.g. first contact, trade with Europeans, or other **First Nation(s)**;
- Education and Training (e.g. where traditional skills, values or knowledge are conveyed).
- Evidence relevant to proof of **Aboriginal title**.

SLIMF (small or low intensity managed forest): a **forest management unit** which meets specific FSC requirements related to size and/or intensity of timber harvesting, and can therefore be evaluated by certification bodies using streamlined evaluation procedures. The applicable FSC requirements are defined in FSC-STD-01-003 **SLIMF** Eligibility Criteria (FSC-AC, July 2004, see *FSC Regional Certification Standards for BC – Small Operations Standards*.).

SLIMF group: A group of **forest management unit**s each of which meets the criteria as a **SLIMF** (see *FSC Regional Certification Standards for BC – Small Operations Standards*.).

Social impacts: The consequences to society as a whole, communities, or individuals of the **manager**'s decisions and activities that alter the ways in which people organize to meet their needs, live, work, play or interact.

Soil conservation hazards: Soil disturbance hazards; these indicate the sensitivity of a site to soil degrading processes which have the potential to result in negative impacts on soil fertility, forest productivity, water quality and/or development infrastructure (e.g., roads); frequency and/or intensity of these processes can be increased by poor planning or inappropriate application of management treatments, especially on sites with high hazards; categories of hazards include: soil **compaction** and puddling, soil displacement, waterborne soil erosion (surface soil or road and ditch), mass wasting and forest floor displacement (See FPC Mapping and Assessing Terrain Stability Guidebook (1999), Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook (1999) and Land Management Handbook 47 – **Silviculture** prescription data collection field handbook (2000).

Succession: Progressive changes in species composition and forest community structure caused by natural processes (nonhuman) over time (FSC-AC, July 2004).

Tenure: Socially defined agreements held by individuals or groups, recognised by legal statutes or customary practice, regarding the "bundle of rights and duties" of ownership, holding, access and/or usage of a particular land unit or the associated resources there within (such as individual trees, plant species, water, minerals, etc) (FSC-AC, July 2004).

Terrain mapping: Application of the BC Terrain Classification System to the mapping of the physical characteristics of the land surface (Howes and Kenk, 1997; Resources Inventory Committee, 1995). Terrain maps show the distribution of surficial materials, material texture, surface expression (landforms and material thickness), soil drainage, slope steepness and geomorphic processes such as mass movement. Where mapping objectives include **forest management** issues other than slope stability, other **hydrologic features**, soil characteristics or vegetation information may also be collected. (See also definitions of **Terrain stability mapping** and **Terrain and soil characteristics**.)

Terrain and soil characteristics: The physical and biological characteristics of the earth's surface: landforms and topography, geological materials, **hydrologic features**, and the natural earth-surface processes that bring about changes to landforms and surface materials. Terrain characteristics that appear on terrain and terrain stability maps are: surficial material, surficial material texture, surface expression (landform and material thickness), geomorphic processes, soil drainage and slope steepness. Soil characteristics commonly inventoried include surface soil and subsoil fine fraction textures, coarse fragment content, soil moisture regime, soil nutrient regime, depth to impermeable layer, and classification and depths of soil organic layers (See FPC Mapping and Assessing Terrain Stability Guidebook 1999 and Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook 1999, Howes and Kenk 1997 and definitions of **Terrain mapping** and **Terrain stability mapping**).

Terrain stability mapping: Terrain mapping combined with the interpretation of slope stability (landslide) hazards from the terrain data. Terrain stability maps generally show polygons labeled with landslide-initiation hazards (stability class) on a topographic base map. Additional features, such as landslide headscarps and debris flow tracks, are shown by representative ("on-site") symbols. Two kinds of **terrain stability mapping** are defined by the Forest Practices Code 1999: reconnaissance **terrain stability mapping** (RTS) and detailed **terrain stability mapping** (DTS). (See also definitions of **Terrain mapping**, **Terrain survey intensity level**, **Likelihood of landslide initiation** and Terrain stability field assessments, and the FPC Mapping and Assessing Terrain Stability Guidebook 1999).

Terrain survey intensity level (TSIL): The amount of field checking carried out for a terrain or **terrain stability mapping** project. Five TSILs are defined primarily according to the percentage of terrain polygons that are checked in the field: A: 75-100%; B: 50-75%; C: 20-50%; D: 1-20%; and E: no field checking. Full definitions for TSILs also specify rates of field progress per crew day, and average size of terrain polygons. TSIL is a significant measure of map reliability because mapping accuracy is often directly related to the amount of time spent in the field (See also definition for **Terrain stability mapping** and the FPC Mapping and Assessing Terrain Stability Guidebook 1999).

Threatened species: Any species, which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (FSC-AC, July 2004). In the BC context this term has a more specific meaning (See BC Conservation Data Centre (CDC) at http://srmwww.gov.bc.ca/cdc/ or COSEWIC at http://www.cosewic.gc.ca/).

Timber harvesting landbase (THLB): Productive forest land within the **management unit** where the **manager** has determined that forest harvesting is acceptable and economically feasible, given the requirements for meeting the FSC-BC Regional Standards, objectives for all relevant forest values, existing timber quality, market values and applicable technology. The **THLB** includes productive forestlands converted to non-forest use to facilitate **forest management** (e.g. roads, landings, borrow pits) as well as stand level retention areas not included in the protected reserve network. The **THLB** does not include productive forest lands mapped as a portion of the protected reserve network (e.g., riparian reserves, habitat reserves, unstable areas that meet biodiversity objectives) and other inoperable areas (e.g., low productivity sites, steep inaccessible terrain). Where **dynamic reserves** are present, the portions NOT meeting the criteria for counting as part of the protected reserve network are considered part of the **THLB** (i.e. age <80% of the estimated mean stand replacement interval.) (See also **Dynamic reserves**).

Traditional knowledge: Includes, but is not limited to knowledge of:

- **local** behaviour, distribution or cycles of fish, wildlife and plant life;
- broader climatic changes or cycles;
- **local ecosystem** or geomorphologic responses to natural or human disturbances;
- **local** population densities or changes in fish and wildlife;
- qualitative information about the utility of a variety of medicinal, edible, or material resource plants;
- requirements or activities needed to maintain or enhance **local ecosystems**.

Use rights: Rights for the use of forest resources that can be defined by **local** custom, mutual agreements, or prescribed by other entities holding access rights. These rights may restrict the use of particular resources to specific levels of consumption or particular harvesting techniques (FSC-AC, July 2004).

Variant: See **Biogeoclimatic Ecosystem Classification (BEC)**.

Well-managed natural forest: See **Natural forest**

Appendix B: Requirements for Riparian Management

The following are FSC-BC Requirements for riparian management under Indicator 6.5*bis*.1.

Context

Planning to maintain riparian values should be undertaken within the broader framework of conservation design and ecosystem-based management as presented in *FSC BC Guidance – A companion document to the FSC Regional Standards for BC* – Guidance on Planning.

Introduction

Riparian areas are **ecosystems** that occur adjacent or in the immediate vicinity of **hydrologic features** (e.g., streams, lakes, wetlands, estuaries). Riparian areas are influenced by the hydrologic feature (e.g., flood plains), and/or have the potential to directly impact the hydrologic feature (e.g., steep gully walls that supply sediment). Riparian forests protect hydrologic features by stabilizing stream banks and shorelines, and by filtering sediment that may otherwise reach the water body. Riparian forests are also essential to maintaining aquatic habitat for fish and other aquatic life. Riparian forests supply large logs to the stream channel to create pools and other habitat, they provide shade to regulate water temperatures, and they supply food for aquatic life through litterfall. Riparian forests and associated flood channels and wetlands are also important habitat to many species, including amphibians (e.g., salamanders, frogs), mammals (e.g., bears, moose, beaver) and many bird species (e.g., great blue herons, wood ducks, songbirds). The intent of the riparian requirements is to ensure these riparian functions are maintained along all waterbodies (in a manner that is **compatible with the range of natural variability** – **RONV**, see the glossary and *FSC BC Guidance– A companion document to the FSC Regional Standards for BC* – Guidance on Applying RONV to Forest Management).

The following sections describe an approach for meeting the riparian conservation requirements of Criterion 6.5. The approach involves assessments by **qualified specialists** to determine riparian management requirements for each **riparian assessment unit** (e.g., a watershed, See also Glossary and Assessment Framework below). This approach also includes a minimum budget of reserves and management zones to provide consistency of application, to provide certifiers with a definitive threshold, and to guard against misuse of the flexibility offered.

Assessment Framework

This section provides a framework for assessments and analyses that can contribute to developing site specific riparian management strategies. Table 1 summarizes the range of inventory and data needs that may be required across a full spectrum of riparian values. Specific requirements for inventory and assessment will vary with the characteristics of any given **management unit**, and therefore, not all elements of the framework will be applicable to all watershed assessment units. Table 2 summarizes the range of assessments that may be required to determine riparian management strategies for maintaining a full suite of riparian functions in any given situation. Table 3 provides a summary of threshold riparian area budgets for meeting FSC-BC riparian management requirements under Criterion 6.5. Where assessments determine that maintenance of

riparian functions requires retention in excess of the threshold budgets, the direction of the assessments should be followed. Where the assessments indicate that riparian functions can be adequately maintained with less retention than the threshold budgets, the remaining budgets can be used to fulfill other terrestrial habitat requirements associated with riparian areas (e.g., Criteria 6.2, 6.3, 6.4 and 9.3). Use of the riparian assessment approach involves six steps as described below and as illustrated in Figure 1.

Step 1. Inventory and Classification of Hydrologic Features.

The first step in riparian management is to identify, map and classify the **hydrologic features** present on the **management unit**. The FSC-BC classification system for hydrologic features is based on the BC provincial government classification; however, it groups some government riparian classes and splits some others.

Under FSC-BC Criterion 6.1, inventory and classification includes determination of watershed and sub-basin boundaries, **H60 lines**, location of springs, location and width of stream reaches, location and extent of lakes and wetlands, and the location of domestic and irrigation water intakes. Stream classification for deployment of riparian management strategies also requires the determination of the presence of fish and aquatic habitat, the distance upstream from fish-bearing waters, and the presence of licensing for domestic water use.

Although ideally the **manager** would map and classify all hydrologic features and riparian areas at the strategic planning stage, this is NOT a requirement of this approach. At the strategic planning stage the **manager** is only required to use existing information (e.g., TRIM maps, existing fish inventories, airphotos) to estimate amount and location of various hydrologic features. Actual field mapping and classification of waterbodies and riparian areas can be finalized at the operational level during road and cutblock layout. As more detailed operational information becomes available, it can be used to update the strategic information.

The classification for streams, wetlands, lakeshores and marine shorelines is provided in Table 1. These are adapted from the BC Forest Practices Code Guidebooks for Riparian and Lakeshore Management (BC MoF 1995a and 1995b) and the Clayoquot Sound Scientific Panel 1995. The definitions of S1a, S1b, S2, S3 and S4 classes are the same as the FPC; however, the specifications for riparian forest retention have been modified. FPC S5 and S6 stream classes have been subdivided to better account for streams potentially affecting fish-bearing reaches and those present in domestic watersheds, as follows:

- S5a streams include large non-fish-bearing streams, moderate-to-large streams likely to influence fish-bearing streams, and moderate-to-large streams in non-community domestic watersheds;
- S5b streams include moderate sized non-fish-bearing, non-community watershed streams that are: unlikely to influence fish-bearing streams, and not located in domestic watersheds;
- S6a streams include small non-fish-bearing, non-community watershed streams that are: likely to influence fish-bearing streams, or located in domestic watersheds.
- S6b streams include very small non-fish-bearing, non-community watershed streams, and small non-fish-bearing streams that are: not likely to influence fish-bearing streams, or not located in domestic watersheds.

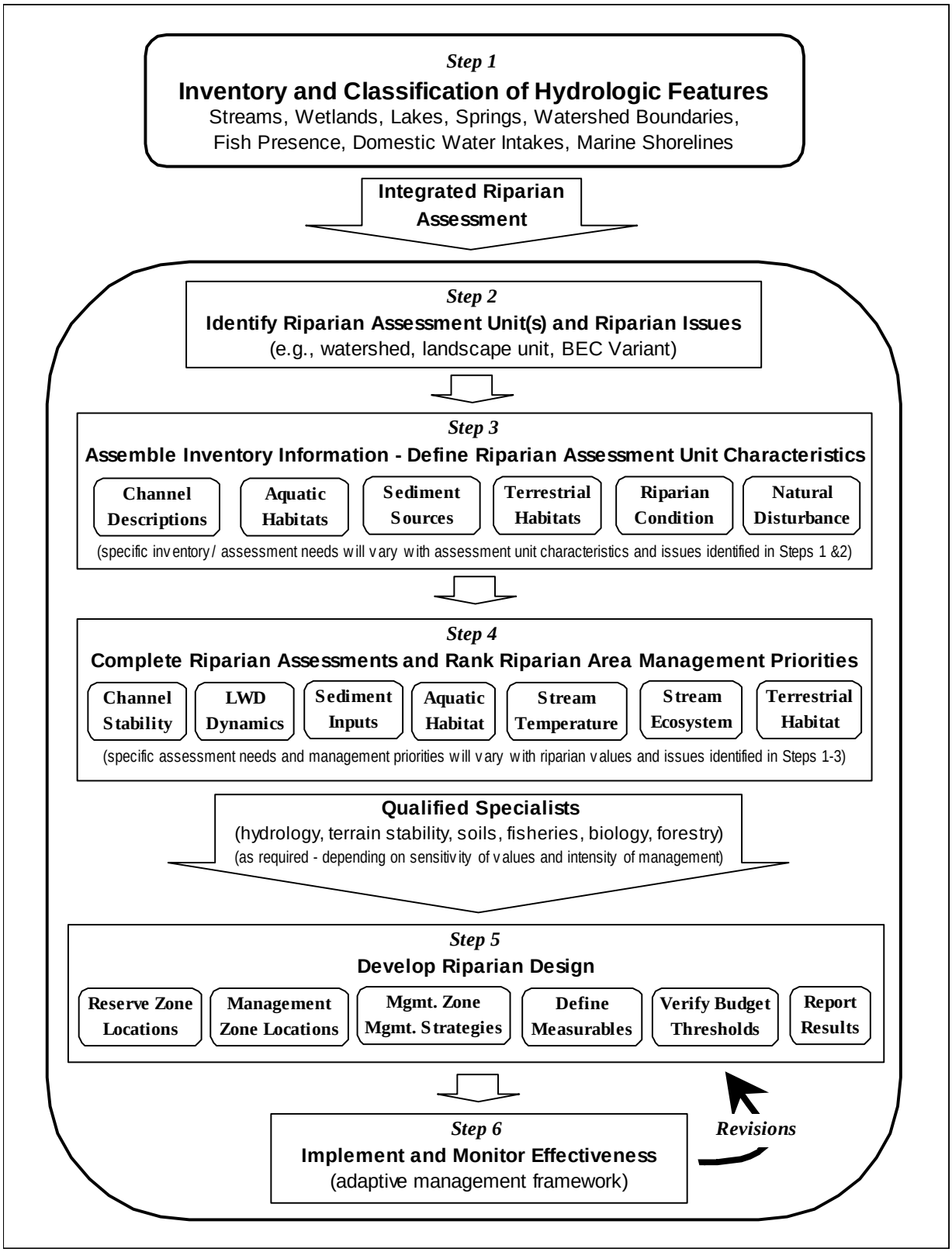

Figure 1. Schematic representation of the six steps necessary for application of the integrated riparian assessment procedure (aquatic habitat includes near-shore marine and littoral zones where applicable).

Step 2. Identification of *Riparian Assessment Unit(s)* and Riparian Issues.

Before commencing the assessment itself, an appropriate unit(s) for the assessment and application of the results must be selected. For stream channel riparian assessments the logical unit is usually a watershed or potentially a group of watersheds (e.g., on face units). For wetlands, lakeshore and/or marine shore riparian planning, or stream riparian planning on extensive plateaus or coastal plains, the unit may be a **landscape unit**, a BEC **variant** within an **ecosection** or possibly an **ecosection**. The appropriate size of assessment unit will vary depending on stream density, wetland and lake density, complexity of the marine shoreline, topography and other factors. In general, units should fall between 5,000 and 50,000 ha. Where appropriate units involve multiple **management unit**s, **manager**s and/or management agencies, as many as possible of the relevant parties should be involved in the assessment process. Where a **management unit** forms only a portion of the appropriate assessment unit, and an integrated assessment is not feasible, the **manager** can proceed with an assessment limited to the **management unit** (steps 2 through 4 below), but the assessment process must still define an appropriate assessment unit, and take into account the context of the whole assessment unit and the management regimes present in other parts of the assessment unit when developing a riparian management strategy for the **management unit** (step 5 below). Within each assessment unit, the types of hydrologic features present, known aquatic and terrestrial habitat use and sedimentation risks should be reviewed to identify the relevant riparian functions, potential riparian management issues, and what inventories and assessments may be required (see Tables 1 and 2).

Step 3. Obtain relevant *Riparian Assessment Unit* characteristics from inventory information.

This step focuses on using basic inventory information to identify important **ecosystem** and watershed processes, known sensitivities and specific critical or vulnerable sites (See Table 1). This step begins with identification and mapping of the spatial extent of the hydroriparian **ecosystem**, followed by assembly of more detailed information regarding various components of that **ecosystem**. Not all functions or inventory needs shown in Table 1 will necessarily be required in all assessment units. The recommended inventory and data sources, and interpretive requirements are built around the existing planning framework in British Columbia. Where information gaps exist, they may be filled through collection of additional inventory information, or through use of modelling and/or assumptions. All assumptions and their rationale should be clearly specified in the final riparian design report (prepared in step 5).

It is assumed here that many of the basic inventories are already available for many watersheds and other **Riparian Assessment Units**, especially Community Watersheds and High Value Fisheries Watersheds (See Table 1). Implementation of the Forest Practices Code and the Watershed Restoration Program has resulted in the completion of numerous relevant inventories including: **terrain and soil characteristics** and hazard interpretations, channel stability assessment and interpretation (including peak flow assessment), fish presence and aquatic habitat assessment, riparian condition, terrestrial **ecosystem** mapping, predictive **ecosystem** mapping and habitat capability mapping. The far right column of Table 1 indicates the type of information that must be extracted from these inventories to provide a basis for assessment of riparian management requirements.

Step 4. Complete riparian assessments and rank riparian areas for potential management strategies.

The riparian assessments shown in Table 2 are carried out with input from **qualified specialists** appropriate to the values and risks identified. The preliminary riparian functions and assessment needs identified in Steps 2 and 3 should guide the determination of what assessments are applicable for individual assessment units, and what specialists are appropriate. These assessments would normally include a multidisciplinary group of persons with expertise in hydrology, terrain/soils/geomorphology, fisheries habitat, wildlife biology, **landscape** ecology and forestry. These individuals may include many of the same people who conducted the inventories. In some situations the assessments may require focused expertise such as a specialist in amphibian biology, stand structure, windthrow management and/or salmon spawning habitat.

The goal of these assessments is to identify stream reaches and/or stream segments (i.e., sub-reaches) with aquatic habitat values, stream reaches that influence those values and stream reaches/segments that are vulnerable to riparian disturbance. Each assessment includes a ranking of vulnerable locations where greater riparian retention may be recommended and a description of the nature of the vulnerability and the potential constraint it poses on the management of riparian vegetation. All assumptions must be clearly identified. It is preferable that these assessments be carried out with interaction and exchange between the assessors as implied by Figure 1.

The array of potential riparian values, functions and vulnerabilities is reviewed on an analysis-unit basis (as indicated in Step 2), to develop a ranking of stream reaches for which riparian conservation measures are required. Riparian retention for terrestrial habitat forms an integral part of this step.

Step 5. Develop riparian management strategies and implement specific riparian management measures.

The **manager** should use his/her **local** knowledge and experience to develop riparian management measures. If they are available, the **manager** should also consult other studies such as riparian or watershed or channel assessments, fisheries or wildlife habitat surveys, TEM/PEM mapping, windthrow assessments or terrain stability mapping. The EBM Hydroriparian Planning Guide[1] and the Clayoquot Sound Scientific Panel report offer other compatible approaches to riparian management (especially for coastal areas). If the **manager** is uncertain regarding the identification of specific riparian values, risks to aquatic values or measures necessary to protect hydrologic features, the **manager** should consult with qualified specialists for further guidance.

Based on the compilation and integration of the various riparian values, functions and vulnerabilities, a riparian management design is developed that provides the temporal and spatial layout of forest reserve zones and management zones for riparian areas. The design should clearly indicate how and where the identified riparian components and functions have been addressed: e.g., channel stability (including bank stability and large woody debris), sediment control, aquatic habitat (including temperature and nutrient needs), floodplain functions (e.g., water storage, sediment accumulation), groundwater functions, terrestrial habitat functions of riparian areas and **landscape connectivity**. The riparian management regime should include long-term projections of riparian condition, and incorporate sufficient flexibility to accommodate stochastic disturbances and future revisions necessitated by monitoring results. The design should be mapped and summarized in the **management plan**. Supporting information should be compiled that include a rationale for the design, and data demonstrating that it meets or exceeds the minimum budgets set out in Table 3. The strategies and measures should also be reflected in assumptions for timber supply analyses and calculation of allowable annual cuts.

[1] Suggest sources of information and how to obtain them are listed in the references at the end of the Annex.

The riparian management budget minimums specified in Table 3 anticipate the utilization of both **riparian reserve zones** and **riparian management** zones. Because the width, distribution and potential importance of riparian areas vary from waterbody to waterbody, using a single width or retention level for all situations is inappropriate. Where streams are deeply incised in gullies or canyons, the riparian area may be relatively narrow, while streams that are in broad u-shaped valleys may have wide floodplains and the riparian areas may coalesce with valley bottom wetlands. In drier areas, coarse textured glaciofluvial terraces may extend right up to lakeshores or wetlands, leaving essentially no riparian areas on one side, while there may be a wide zone of wet soils and riparian vegetation on the other side. However, on average, a minimum level of retention will likely be required to maintain riparian values across a landscape, and this is the approach presented in Table 3.

The minimum requirements provided in Table 3 are intended to be applied by the **manager** in a manner that reflects the distribution of riparian values and risks to those values within the **management unit**. There is flexibility to utilize whatever combination of reserve zones and management zones that are appropriate to protecting the values present, as long as the average overall retention levels are equivalent to meeting or exceeding the minimum retention levels specified in Table 3. When applying riparian management measures, the **manager** should consider the riparian functions listed in column two of Table 2 and factors such as:

- channel and bank stability,
- terrain stability and other sediment sources,
- supply of large logs to stream channels,
- fish habitat,
- stream temperature requirements,
- the supply of nutrients from litterfall, windthrow,
- windthrow hazard,
- riparian habitat for other species, and
- other natural disturbance factors in the riparian area.

For example, deployment may include wide **riparian reserve zone**s along salmon spawning stream reaches or wide floodplains, and partial cutting management zones in wetter riparian areas without flooding, while canyons or dry terraces may have little or no reserve or management zones (see example in Figure 2). The riparian retention budgets in Table 3 are minimums – where risks to aquatic **ecosystem** values are high (e.g., unstable terrain in a community watershed), or riparian values are critical (e.g., high value salmon spawning habitat or red-listed species habitat), riparian protection may have to exceed the minimum budgets to adequately protect the values present.

Where a regional windthrow hazard assessment has suggested potential problems with the stability of specific riparian reserves or management zones, **local** windthrow hazard assessments are carried out and integrated with terrain stability information. The riparian design must be made consistent with the recommendations of these site-specific assessments, while also meeting objectives for the maintenance and/or restoration of riparian functions.

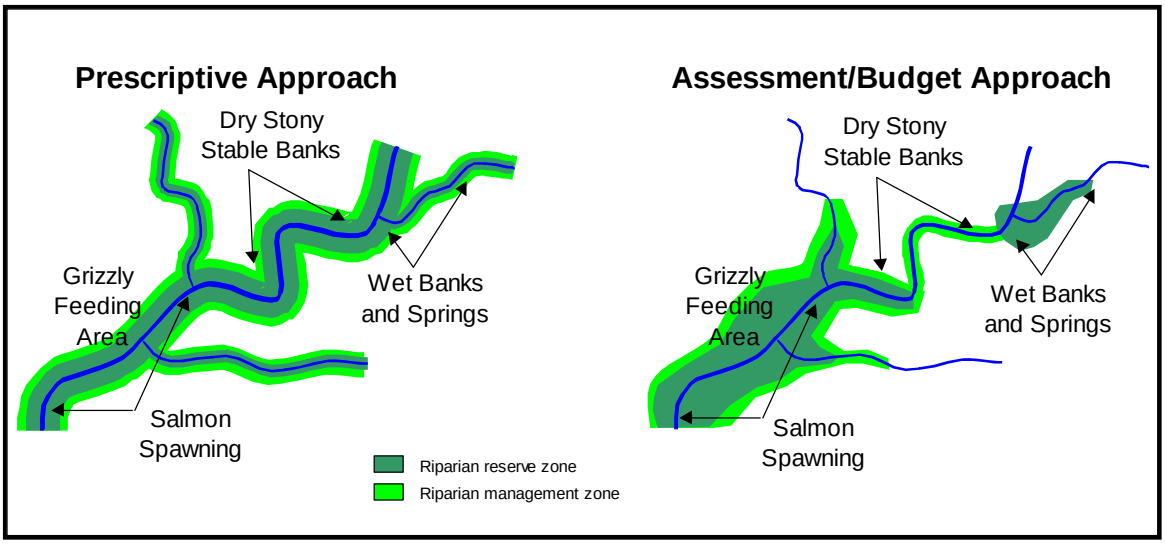

Figure 2. Schematic diagram of **riparian reserve zone** and management zone deployment under the FSC-BC approach – note that reserve and management zones vary in width depending on need, and may be zero in some stream reaches, as long as the minimum budgets are met within a watershed assessment unit, and they maintain or restore riparian functions and values.

Step 6. Monitor effectiveness and revise design as required (see also Principle 8).

This step involves three components.

a) Set objectives.

The monitoring and revision step begins with establishing monitoring objectives that address the following questions:

- What are the key cause-and-effect linkages between management and riparian function?
- What relevant trends are expected to be present?
- What physical conditions (aquatic/terrestrial) are desirable to maintain riparian integrity?

Prioritize the objectives. Make them focused and efficient. Include explicit consideration of natural variability.

b) Select appropriate variables and collect data.

For the objectives established in (a), selection of monitoring parameters is carried out with attention to the following:

- identify, evaluate, and prioritize options available to meet the objectives
- identify critical uncertainties in associated knowledge
- monitor over temporal and spatial scales appropriate to the objectives
- choose *measurable* variables
- tailor the monitoring plan to watershed-specific conditions and concerns
- make use of available data to extend the monitoring period

Examples of potential measurable variables include large woody debris pieces (minimum size) per 100 m, riparian stand characteristics (tree size, density, and species), change in stream temperature (over specific segments), percentage of stream with full shade, percentage of bank with active erosion, distribution of canopy closure over stream segments, percentage of pools, etc. Although monitoring of overall resource condition/change (e.g., fish populations) can be useful, this would not be considered part of a riparian monitoring design.

For each objective, a hypothesis should be established which expresses why the measurable variables are selected (rationale) and how they are expected to change in relation to resource trend.

Sampling design should include sampling locations, intensity, methods and schedule, and include identification of how quality assurance will be achieved. These details should be included in a summary report along with expected data analysis needs.

c) Analyze data and revise design.

As monitoring results become available, the objectives are evaluated in light of the following:

- compare outcome with established targets
- assess the effectiveness of the prescriptions in achieving the targets
- are resources responding as expected?
- assess the effectiveness of the targets in maintaining riparian functions – in terms of both the target values and the target parameters
- justification of the chosen monitoring parameters and the associated established targets
- effectiveness monitoring to assess level of success in reaching targets established in Step 4

The riparian design is then revised based on an analysis of the monitoring results.

Table 1. Inventory information and required interpretations for riparian assessments (inventory needs will vary between assessment units).

#	Inventory Information	Associated Riparian Functions[1]	Sources of Information	Inventory Data Interpretations Required for Riparian Assessments
1	Channel Descriptions	LWD recruitment Bank integrity	**Channel assessment**s (from IWAP/CWAP and/or Watershed Restoration Program); for small stream assessment methods see Carver and Putt 1999.	▪ Dominant processes maintaining channel stability/morphology and water quality. ▪ Specific locations where LWD is important/depleted in relation to channel stability/morphology. ▪ Location of channel migration zones and their activity level. ▪ Condition of banks and locations where trees are important to maintaining bank integrity.
2	Sediment Sources (existing and potential)	Sediment moderation	IWAP/CWAP Sediment Source Surveys; Level A & D **Terrain stability mapping**/Assessments; Level B & C Terrain/Soils Mapping and interpretations for TS, LISS, SE, RDE, SD	▪ Dominant processes creating stream sediment sources, and natural range of variability. ▪ Existing sediment sources (natural and development-related). ▪ Location of unstable terrain with potential for sediment delivery to streams. ▪ Location of sites with potential for sediment delivery due to surface erosion processes, especially those associated with road and ditchline erosion.
3	Aquatic Habitat (existing & potential with restoration)	LWD recruitment Stream temperature moderation Litterfall and nutrient dynamics	Stream classification surveys; MELP Regional Fisheries Information; DFO Fisheries Atlas; Fish Habitat Assessments; Fish Wizard website	▪ Dominant habitat-forming processes (including importance of LWD to aquatic habitat). ▪ Aquatic species diversity (fish, amphibians, benthic assemblages). ▪ Location of **critical habitat** sites and their vulnerability. ▪ Description of sediment sensitivity, temperature sensitivity and nutrient needs of aquatic species.
4	Terrestrial Habitats	Provision of Terrestrial Habitats	Wildlife and biodiversity surveys; Terrestrial **Ecosystem** Mapping; Predictive **Ecosystem** Mapping; Wildlife Capability maps; nutrient transfer research studies; airphotos with field verification	▪ Terrestrial species using or potentially using riparian areas (birds, mammals, herptiles). ▪ Riparian habitat types and features required to support terrestrial species present. ▪ Plant communities dependent on proximity to water (i.e. extent of hydroriparian **ecosystem**). ▪ Locations of riparian sites significant to terrestrial species. ▪ Role of riparian areas in landscape **connectivity**, patch sizes , seral stage distribution and transfer of marine/lake-derived nutrients from stream to forest (e.g. salmon carcasses).
5	Natural Disturbance Patterns of Riparian Areas	All	Windthrow hazard mapping; studies on the **range of natural variability** (fire regimes; insect/disease risks etc.)	▪ Role and effect of natural disturbance (fire, windthrow, etc.) in modifying the riparian areas. ▪ Expected past and projected riparian condition based on only natural disturbance patterns. ▪ Regional windthrow hazards in relation to riparian areas.
6	Riparian Condition (existing and projected)	All	IWAPs/CWAPs; Forest Cover mapping; FDPs; TRIM maps; Access **Management Plans;** Spatial Modeling for Timber/ Habitat Supply	▪ Existing riparian condition including identification of the cumulative effects of development. ▪ Restoration requirements to reestablish riparian function and aquatic **ecosystem integrity**. ▪ Projected riparian condition over next 250 years, incorporating planned development and the results of sensitivity analyses (including consideration of stochastic events, the **range of natural variability** and projected harvesting, roads and other development).

[1] Refer to Carver (2001) for explanation of riparian functions.

Table 2. Integrated riparian assessments to support selection of detailed riparian design (not all assessment units will require all assessments).

#	Assessment Type	Associated Riparian Functions[1]	Elements of the Assessments	Minimum Factors to be Considered
1	Channel Morphology, Condition, and Stability	LWD recruitment Bank integrity Moderation of sediment yield	Describe and classify all stream reaches. ▪ Develop generalized classes (and corresponding spatial layout) of stream behaviour and identify dominant processes of each type2. Establish relative importance and management needs of channel migration zones. Rank stream reaches or reach segments according to their sensitivity to changes in LWD recruitment, sediment inputs, and flow regime. Establish riparian management requirements for each class of stream behaviour2.	Stream channel characteristics: width, gradient, entrenchment, LWD requirement, presence/absence of fish and consumptive-use status Channel disturbance history (natural and development related) Channel sensitivity to riparian disturbance Aquatic habitat values Potential for flooding and/or channel-migration impacts on downstream human habitation and other infrastructure **Natural disturbance regime**s
2	LWD Dynamics	LWD recruitment Bank integrity Moderation of sediment yield	▪ Identify LWD recruitment rates (including size ranges) required to support channel morphology/stability and relevant **aquatic habitats**. ▪ Model LWD recruitment through time (including upslope sources). ▪ Rate priorities of stream reaches (or reach segments) for LWD recruitment requirements.	LWD recruitment factors (bank-erosion, windthrow, growth rates, species and size requirements etc.) Potential for reserve zones and/or management zones to meet identified LWD recruitment needs (e.g., RRZ widths, RMZ silvicultural systems).
3	Sediment Inputs	Moderation of sediment yield	▪ Identify stream reaches or reach segments with significant existing and potential for sediment sources or where sediment delivery to the stream channel could be reduced with increased riparian stand retention. ▪ Determine the location of riparian sites vulnerable to being deforested due to mass movements. ▪ Rate priorities of stream reaches (or reach segments) for riparian reserves for moderation of sediment inputs (include consideration of upslope management regimes).	Location and input rates of existing sediment sources. Location and extent of Class IV and V terrain-stability map polygons with a high hazard for Landslide Induced Stream Sedimentation. Location and extent of map polygons with a high hazard for Surface Soil Erosion and/or Road and Ditchline Erosion and a high hazard for Sediment Delivery. Development plans for roads and forest harvesting.

[1] Refer to Carver (2001) for explanation of riparian functions.

[2] An example application of this objective is found in the Channel Guild Concept (e.g., Plum Creek Timber Company) – other examples with suitable rationale may also be appropriate.

(table continued on next page)

Table 2 (cont'd). Integrated riparian assessments to support selection of detailed riparian design.

#	Assessment Type	Associated Riparian Functions[1]	Elements of Assessment	Minimum Factors to be Considered
4	**Aquatic habitats**	LWD recruitment Moderation of sediment yield	▪ Identify and describe all stream reaches (or reach segments) with significant **aquatic habitats** (fish, herptiles, benthics etc.). ▪ Identify non-fish-bearing reaches (or reach segments) with potential influence on downstream fish-bearing reaches (temperature, LWD, sediment delivery, organic material, etc.). ▪ Identify stream reaches or reach segments with aquatic habitat requirements for LWD that are above basic channel stability requirements. ▪ Rate priorities of stream reaches (or reach segments) for riparian reserve and management zones to maintain the integrity of **aquatic habitats**.	Fish species present including their diversity, abundance, and species sensitivities. **Aquatic habitats** for fish spawning, rearing, and migration. **Aquatic habitats** for other species. Habitat sensitivities to changes resulting from riparian-stand modifications (LWD, stream temperature, shading, nutrient inputs, etc.).
5	Stream Temperature	Moderation of stream temperature	▪ Identify temperature-sensitive species and values (including benthic assemblages); define appropriate target temperature ranges, and canopy requirements to achieve the temperature targets. ▪ Identify temperature-sensitive stream reaches (aquatic habitat areas and upstream reaches with potential influence on habitat areas). ▪ Rate priorities of stream reaches for riparian reserve and management zones to maintain stream temperatures within target ranges.	Types and locations of temperature sensitive species and values. Type, density, size of riparian vegetation necessary to maintain stream temperatures. Natural riparian disturbance patterns.
6	Stream **Ecosystem**	Litterfall and nutrient dynamics	▪ Identify nutrient sources and pathways in relation to aquatic values/species, and define the role of riparian vegetation in those pathways. ▪ Identify targets defined both spatially and temporally. ▪ Rate priorities of stream reaches for riparian reserve/management zones to maintain stream temperatures within the target ranges.	Types, rates and significance of litterfall to benthic communities, and other aquatic species.
7	Terrestrial Habitats	Provision of Terrestrial Habitats	▪ Identify riparian habitat needs of relevant terrestrial species and hydroriparian plant communities (including hydrophytic plant communities, rare **ecosystem**s and stand structural features such as CWD). ▪ Identify riparian area role in horizontal transfer of marine/lake derived nutrients from stream to forest. ▪ Identify riparian requirements for landscape **connectivity**. ▪ Rate priorities of stream reaches for riparian reserve and management zones to meet the habitat needs of terrestrial species and maintain rare **ecosystems**.	Riparian terrestrial habitat requirements particularly for microclimate, specialized vegetation (e.g., plant communities dependent on proximity to water) and stand structure (including invertebrates, reptiles, amphibians, birds, small mammals and large mammals); riparian role in providing habitat for species that transfer nutrients between terrestrial and aquatic **ecosystem** components (e.g., grizzly bears and salmon).

[1] Refer to Carver (2001) for explanation of riparian functions.

[2] An example application of this objective is found in the Channel Guild Concept (e.g., Plum Creek Timber Company) – other examples with suitable rationale may also be appropriate.

Table 3. *Minimum* budgets to be deployed during implementation of integrated riparian assessments. Budgets are to be applied at the *Riparian Assessment Unit* level.

Stream Class.[1]	Definition (fish presence, watershed status, stream width, stream class[1])	Riparian budget minimums[2,4] (RRZ/RMZ[3] widths and retention levels will vary depending on deployment)
S1a	Fish present or community watershed, >100 m wide	Minimum budgets for streams in these classes: RRZ – 6 ha/km RMZ – 8 ha/km with 65% BA retention (30 m reserve and 40 m 65% retention mgmt. zone or other combinations that result in equivalent retention)
S1b	Fish present or community watershed, 20-100 m wide	
S2	Fish present or community watershed, 5-20 m wide	
S3	Fish present or community watershed, 1.5-5 m wide	Minimum budgets for streams in these classes: RRZ – 6 ha/km RMZ – 4 ha/km with 65% BA retention (30 m reserve and 20 m 65% retention mgmt. zone, or other combinations that result in equivalent retention)
S4	Fish present or community watershed, <1.5 m wide	
S5a	Fish absent, not in community watershed, >3 m wide, and: a) in a domestic watershed, and/or b) ≤500 m upstream of fish-bearing stream, and/or c) >10 m wide	Minimum budgets for streams in this class: RRZ – 4 ha/km RMZ – 4 ha/km with 65% BA retention (20 m reserve and 20 m 65% retention mgmt. zone or other combinations that result in equivalent retention)
S6a	Fish absent, not in community watershed, 0.5-3 m wide in the interior (1-3 m on the coast), and: a) in a domestic watershed, and/or b) ≤250 m upstream of fish-bearing stream	
S5b	Fish absent, not in community watershed, 3-10 m wide, non domestic watershed, and >500 m upstream of fish-bearing stream	Minimum budgets for streams in this class: **NDT**s 1,2 and 4: RMZ – 3 ha/km with 30% BA retention **NDT** 3 RMZ – 3 ha/km with 10% BA retention (15 m mgmt. zones with 30% and 10% retention respectively or other combinations that result in equivalent retention)
S6b	Fish absent, not in community watershed, and: a) 0.5-3 m wide and not in a domestic watershed and >250 m up-stream of fish-bearing stream, or b) < 0.5 m wide in the interior (< 1 m in the coast)o	

[1] S1 – S4, W1 – W5, L1 – L4: classification according to BC Forest Practices Code **Riparian Management Area** Guidebook 1995; S5a, S5b, S6a and S6b as defined above.

[2] Riparian budgets are applied at the level of a **riparian assessment unit** (generally watersheds or other **landscape level** ecological units of 5,000 – 50,000 ha), budgets and stream lengths are calculated and applied to forested portions of the **management unit** (i.e. not in AT or ESSF parkland); where stream densities are high and there is overlap between RRZs or RMZs, the budgets should be reduced by an amount equivalent to the degree of the overlap (e.g., on wet portions of the coast).

[3] RRZ – **riparian reserve zone**; RMZ – **riparian management zone**.

[4] Budget equivalencies for streams can be calculated by multiplying the ha/km by 5 to get the equivalent width of zone in metres (e.g., 6 ha/km ~ 30 m on each side of a stream). The intent of the flexibility is also to allow limited trade-off between the reserve and management zones and between classes, as long as the "equivalent total retention" is comparable (e.g., 10m of reserve zone is equivalent to 20m of management zone at 50% retention); however, total reserve zone area should never be below 80% of the budget for any specific class (i.e. conversion of all reserves zones to management zones is not acceptable).

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Table 3 (cont'd). *Minimum* budgets to be deployed during implementation of integrated riparian assessments. Budgets are to be applied at the *Riparian Assessment Unit* level.

Wetland Class[1]	Definition (wetland type, wetland class[1])	Wetland Riparian Budget Minimums[2,4] (RRZ/RMZ[3] widths and retention levels will vary depending on deployment)
W1-5	Wetlands >1 ha, wetlands 0.25-1 ha in selected BEC **variant**s, wetland complexes and other wetlands with fish	Minimum budgets for wetlands in this class: RRZ – 2 ha/km of wetland perimeter RMZ – 1.5 ha/km with 30% BA retention
Other Wetlands	Unclassified wetlands without fish	Minimum budgets for wetlands in this class: RMZ – 1.5 ha/km with 30% BA retention
Lakeshore Class[1]	**Definition (lake size and type, lakeshore class[1])**	**Lakeshore Riparian Budget Minimums[2,4] (RRZ/RMZ[3] widths and retention levels will vary depending on deployment)**
L1-4	Lakes >1 ha, lakes 0.25-1 ha in selected BEC **variant**s and other lakes with fish	Minimum budgets for lakes in this class: LRZ – 1.5 ha/km of lakeshore LMZ – 1.5 ha/km with 30% BA retention
Other Lakeshores	Unclassified lakes without fish	Minimum budgets for lakes in this class: LMZ – 1.5 ha/km with 30% BA retention
Marine Shoreline Class[1]	**Definition (marine shoreline class[1])**	**Marine Shoreline Riparian Budget Minimums[2,4] (RRZ/RMZ[3] widths and retention levels will vary depending on deployment)**
Open water beaches and low shorelines	Shores with beaches (e.g., shores of unconsolidated cobbles or sand) or low shores without beaches (bluffs < 5m) adjacent to open waters	Minimum budgets for marine shorelines in this class: MRZ – 5 ha/km of marine shore MMZ – 3 ha/km with 50% BA retention
Open water bluffs and cliffs	Shores without beaches and with bluffs >5m or steep bedrock cliffs adjacent to open waters	Minimum budgets for marine shorelines in this class: MRZ – 2 ha/km of marine shore MMZ – 1.5 ha/km with 50% BA retention
Protected waters	Protected water lagoons or estuaries	Minimum budgets for marine shorelines in this class: MRZ – 4 ha/km of marine shore MMZ – 1.5 ha/km with 50% BA retention

[1] Riparian wetland classes (W1-5) and riparian lakeshore classes (L1-4) are based on FPC classes as defined in the BC Forest Practices Code **Riparian Management Area** Guidebook 1995; marine shoreline classes adapted from Clayoquot Sound Scientific Panel 1995.

[2] Riparian budgets are applied at the level of a **riparian assessment unit** (generally watersheds or other **landscape level** ecological units of 5,000 – 50,000 ha), budgets and wetland edges, lakeshores and marine shoreline lengths are calculated and applied to forested portions of the **management unit** (i.e. not in AT or ESSF parkland); where hydrologic feature densities are high and there is overlap between RRZs or RMZs between features, the budgets should be reduced by an amount equivalent to the degree of the overlap (e.g., on wet portions of the coast).

[3] RRZ: **riparian reserve zone**; RMZ: **riparian management zone**; LRZ: **Lakeshore Reserve Zone**, LMZ: **lakeshore management zone**; MRZ: **marine shore reserve zone**, MMZ: **marine shore management zone**. Marine shores are defined as the seaward edge of forest vegetation, and MRZs and MMZs are measured inland from that point.

[4] Budget equivalencies for wetlands, lakeshores and marine shorelines can be calculated by multiplying the ha/km by 10 to get the equivalent width of zone in metres (e.g., 2 ha/km ~ 20 m along the edge of the feature). The intent of the flexibility is also to allow limited trade-off between the reserve and management zones and between classes, as long as the "equivalent total retention" is comparable (e.g., 10m of reserve zone is equivalent to 20m of management zone at 50% retention); however, total reserve zone area should never be below 80% of the budget for any specific class (i.e. conversion of all reserves zones to management zones is not acceptable).

Sources of Further Information:

FPC Guidebooks – available at:
http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/Guidetoc.htm

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Other References

BC Ministry of Forests and BC Ministry of Environment, Lands and Parks. 1998. Riparian assessment and prescription procedures. Watershed Restoration Program Tech. Circular No. 6. MoF and MELP. Victoria, BC

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Carver, M. 2001. Riparian Forest Management for Protection of Aquatic Values: Literature Review and Synthesis. Unpubl. report for FSC-BC. Nelson, BC. 48 pp.

Clayoquot Sound Scientific Panel. 1995. Sustainable Ecosystem Management in Clayoquot Sound: Planning and Practices. Report 5, Province of BC. Victoria, BC. 296pp. Appds.

Appendix C: Highly Hazardous Pesticides

The following is a list of highly hazardous **pesticide**s that are prohibited for use on FSC certified forests, as referred to under Criteria 6.6 and Indicator 6.6.4. This list is from FSC International in the policy "Chemical **Pesticide**s in Certified Forests: Interpretation of the FSC Principles & Criteria" (FSC International Policy (FSC-IP 0001) Revised and Approved July 2002). . This list is current at the time of printing these standards, but the FSC website should be consulted for the most up-to-date list and other policy changes.

Name of chemical	Reason for prohibition (cf. section 4)
Aluminum phosphide	Toxicity similar to sodium cyanide. WHO Table 7.
aldicarb	WHO Table 1, Class Ia.
aldrin	CHC
benomyl	Persistence: 6 - 12 months. Toxicity: LD50 100 mg/kg. LC50 60 - 140 microg/l. Mutagen.
brodifacoum	WHO Table 1, Class Ia. Permitted for control of rodents in Chile, when they are vectors of Hantavirus transmission, in houses and camps.
bromadialone	WHO Table 1, Class Ia. Permitted for control of rodents in Chile, when they are vectors of Hantavirus transmission, in houses and camps.
carbaryl	Toxicity: LD50 of 100 mg/kg in mice.
chlordane	Organochlorine. Persistence: half-life of 4 years. Toxicity: oral LD50 in rabbits approx. 20-300 mg/kg.
DDT	CHC
diazinon	Toxicity: 0.0009 mg/kg/day. LD50 2.75 - 40.8 mg/kg.
dicofol	Persistence: 60 days. Biomagnification: log Kow 4.28.
dieldrin	CHC
dienochlor	Organochlorine. Toxicity: LC50 of 50 microg/l in aquatic environments.
difethialone	WHO Table 1, Class Ia. Permitted for control of rodents in Chile, when they are vectors of Hantavirus transmission, in houses and camps.
dimethoate	Toxicity: RfD 0.0002 mg/kg/day. LD50: 20 mg/kg in pheasants.
endosulfan	Organochlorine. Toxicity: LD50 much less than 200 mg/kg in several mammals. RfD 0.00005 mg/kg/day.
endrin	Organochlorine. Persistence: half-life >100 days. Toxicity: LD50 <200 mg/kg. Biomagnification high in fish.
gamma-HCH, lindane	CHC
heptachlor	Organochlorine. Persistence: half-life 250 days. Toxicity: LD50 100-220 mg/kg in rats, 30-68 mg/kg in mice. RfD 0.005 mg/kg/day. Biomagnification: Log Kow 5.44.

Name of chemical	Reason for prohibition (cf. section 4)
hexachlorobenzene	WHO Table 1, Class Ia.
mancozeb	Toxicity: RfD 0.003 mg/kg/day.
methoxychlor	Persistence: half-life 60 days. Toxicity: RfD 0.005 mg/kg/day. LC50 <0.020 mg/l for trout.
metolachlor	Biomagnification: log Kow 3.45.
mirex	Organochlorine. Persistence: half-life > 100 days. Toxicity: LD50 50-5000 mg/kg. Carcinogen. Bioaccumulation high.
oryzalin	Persistence: Half-life 20-128 days. Toxicity: LD50 100 mg/kg in birds.
oxaphene (camphechlor)	Organochlorine. Persistence: > 100 days, high. Bioaccumulation high.
oxydemeton-methyl, Metasystox	WHO Table 2, Class Ib.
oxyfluorfen	Toxicity: RfD 0.003 mg/kg/day Log Kow 4.47. (Goal, Koltar)
paraquat	Persistence: > 1000 days. Toxicity: RfD 0.0045 mg/kg/day. Log Kow 4.47.
parathion	WHO Table 1, Class Ia.
pentachlorophenol	WHO Table 2, Class Ib.
permethrin	Toxicity: Log Kow 6.10. LC50 0.0125 mg/litre in rainbow trout. To be prohibited, with a derogation to the end of 2003 for use with seedlings and young planted trees, when used with minimal impacts on insects and aquatic systems. (Permasect)
quintozene	Organochlorine. Persistence: 1 - 18 months. Toxicity: high. Biomagnification: Log Kow 4.46.
simazine	Toxicity: RfD 0.005 mg/kg/day.
sodium cyanide	WHO Table 2, Class Ib.
sodium fluoroacetate,	1080 WHO Table 1, Class Ia. Permitted for control of exotic mammals in Australia and New Zealand, where they cause damage to native plants or animals.
2,4,5-T	Organochlorine. Toxicity: medium to high in mammals. Often contaminated with dioxin.
rifluralin	Toxicity: RfD 0.0075 mg/kg/day. Log Kow 5.07. LC50 0.02 mg/litre. (under review, to be clarified)
Warfarin	WHO Table 2, Class Ib. Permitted for use against exotic mammal pests of native forests, including grey squirrels in UK, by approved operators with approved traps.
Pesticides containing lead (Pb), cadmium (Cd), arsenic (As), or mercury (Hg).	

Appendix D: High Conservation Value Forest Assessment Framework[2]

Context

This Appendix provides a framework for meeting Principle 9 of the FSC-BC standards. It is presented separately here for ease of use, but should also be considered an integral component of the larger **ecosystem**-based management framework and conservation design presented in the *FSC BC Guidance*.

Background

The Forest Stewardship Council (FSC) introduced the concept of **High Conservation Value Forests (HCVFs)** in 1999 when Principle 9 was revised. The concept focuses on the environmental, social and/or cultural values that make a particular forest area of outstanding significance. The intent of Principle 9 is to ensure precautionary management of those forests such that identified High Conservation Values are maintained, restored or enhanced. The FSC-BC definition of **HCVF**s is provided in the glossary.

Purpose of the HCVF Assessment Framework

The purpose of this framework is to assist applicants for FSC certification in determining whether some or all of the forest area under their management is a High Conservation Value Forest. The framework is organized as a series of questions that guide the applicant through the assessment process. The assessment will then be verified and validated by the certification body during the certification assessment process. Although the framework specifically follows the **HCVF** definition provided by the FSC, it can also be used as a guide outside of the certification process to supplement conservation planning in forest **ecosystems**.

As part of the **HCVF** assessment, the **manager** should also consider the results of assessments required under Indicators 6.1.1-6.1.7 , as well as **tenure** distribution, community adjacency and social, economic and cultural factors pertaining to forest habitats and uses of the forest relevant to each of the potential **HCVFs** being assessed

Using the Framework

The framework is organized as a table covering 6 categories derived from the definition of **HCVF**s from the FSC standards. The 6 categories are:

[2] This framework was adapted from Appendix 3 of the Canadian Boreal FSC Standards (2003). The original version of the checklist was developed by an FSC Canada HCVF workshop in January 13-14, 2003. Parts of the framework originated from an interim HCVF toolkit develop by WWF-Canada and Tembec Inc. and an international working group (convened by ProForest UK).

Category 1: Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, **endangered species**, refugia);

Category 2: Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the **management unit**, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;

Category 3: Forest areas that are in or contain rare, threatened or endangered **ecosystems;**

Category 4: Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control);

Category 5: Forest areas fundamental to meeting basic needs of **local** communities (e.g., subsistence, health); and,

Category 6: Forest areas critical to **local** communities´ traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such **local** communities).

Each category is associated with a series of question that aim to identify whether the **management unit** contains any of the values relevant to each category. Negative answers to these questions mean that the forest operation likely does not include High Conservation Values (HCV) in that category. Positive answers lead to further investigation and more detailed questions.

In the following table, the first column (Item) contains a number of general questions associated with the determination of whether the HCVs are present in the forest area. The second column (Rationale) explains the rationale for the conservation of the particular value. The third column (Possible Sources) provides sources of information on these values (e.g., COSEWIC lists in Canada, Conservation Data Centre lists, etc.). The fourth column (Criteria and Guidance for Assessing HCVs) is used if the response to any of the first series of questions (Item column) is positive. It includes a series of sub-questions to assist the applicant in determining whether the evidence supports a **HCVF** designation. These questions have been structured as Yes/No answers.

The significance of the question in determining HCV status is indicated by the words DEFINITIVE or GUIDANCE.A positive response to any question that is labelled DEFINITIVE means that the elements under consideration are HCVs. However, a negative response to a question labelled DEFINITIVE should not be interpreted to mean that the HCV threshold has not been reached. Rather, the applicant should then answer the questions labelled GUIDANCE. Positive answers indicate the potential presence of HCVs. If a number of questions labelled GUIDANCE are answered positively, it strengthens the potential for the presence of HCVs. It is then expected that the applicant will provide a summary substantiating why the forest area was identified as an HCVF. In the case that most/all answers are negative it is a clear indication that the forest area does not contain HCVs. This is verified and validated by the certification body during the certification assessment process.

The framework is not intended to be a prescriptive approach. Guidance in interpreting the six components of the HCVF definition leads the investigation to develop the evidence and thresholds for making an HCV designation. Whether or not an HCV designation is determined, the applicant should provide a rationale for the decision.

The Issue of Scale

Criterion 9.1 of Principle 9 states that assessments for the presence of HCV attributes will be appropriate to scale and intensity of forest management. This implies that the expectations for smaller or less intensively managed forest operations would be lower than for larger or more intensively managed operations. For this reason, the BC Small Operations standards have a less intensive HCVF assessment procedure.

The FSC definition implies that there are multiple scales at which HCVFs and their attributes are identified. For example, "globally or nationally significant" would be applied to broad landscapes or **ecoregional** scale forests that are significant on a global, continental or Canadian level, while "regionally significant" might apply to a watershed or a particular **ecosystem** that is significant at the provincial or regional level.

The FSC definition also seems to imply differing scales between the various HCVs. For example, 'large landscape level forest' (Category 2) will tend to be large in geographic scale (e.g. > 500,000 ha) and so the thresholds used to describe them and related **conservation attributes** must be relevant to that large scale. Identification of an HCV Forest based on "concentrations of biodiversity values" (Category 1) may be large, medium or small (e.g. <1000 ha) in geographic scale, and should be appropriate to the biology of the species or groups of species in question. Forest areas identified as HCV Forests on the basis of "being in or containing rare, threatened or endangered **ecosystems**" (Category 3) might encompass a range of scales, from large areas to single stands or ecosites. Forests identified as providing "basic services of nature" (Category 4), and "basic needs of communities" (Category 5) might be medium to large in scale and their values and related **conservation attributes** should be relevant to those scales.

Selection of a particular scale at which to assess a HCV will directly impact the identification of values, and will have implications for designing appropriate management and monitoring systems. For example, assessment at too small a scale will likely increase the risk of management in that **ecosystem**, and will potentially compromise a **precautionary approach**. The draft checklist included in this document suggests a hierarchical approach to defining HCVs that starts with a broad scale and works down to a finer scale assessment.

HCVs are environmental, ecological and socio-economic in nature and thus they are unlikely to follow administrative boundaries. The HCV and the HCVF within which it is located may be smaller or larger than the **management unit** being audited for certification. This should be taken into account by the forest **manager**, though the **manager**'s direct responsibility is limited to the forest over which she/he controls.

The Precautionary Approach

An important component to the management of HCVFs is the application of a "**precautionary approach**"(see FSC-BC glossary definition). As HCVs are values that are deemed to be the "most important" and thus require the highest "duty of care", the application of a **precautionary approach** is one way of helping to ensure that we maintain these values. There are numerous specific interpretations of a **precautionary approach**. In general, they all describe an approach where the onus is on the **manager** to demonstrate a low risk of negative impact from management activities, taking into account uncertainty about relationships or values. HCVF management does not necessarily require full protected or reserve establishment, but it does require an increased level of management over what would be applied to non-HCVF areas (see Figure 1).

FSC Principle 9 Advisory Panel[3] defined a **precautionary approach** in the context of Principle 9 as: "Planning, management activities and monitoring of the attributes that make a **forest management unit** a HCVF should be designed, based on existing scientific and indigenous/**traditional knowledge**, to ensure that these attributes do not come under threat of significant reduction or loss of the attribute and that any threat of reduction or loss is detected long before the reduction becomes irreversible. Where a threat has been identified, early preventive action, including halting any potentially detrimental action, should be taken to avoid or minimize such a threat despite lack of full scientific certainty as to causes and effects of the threat".

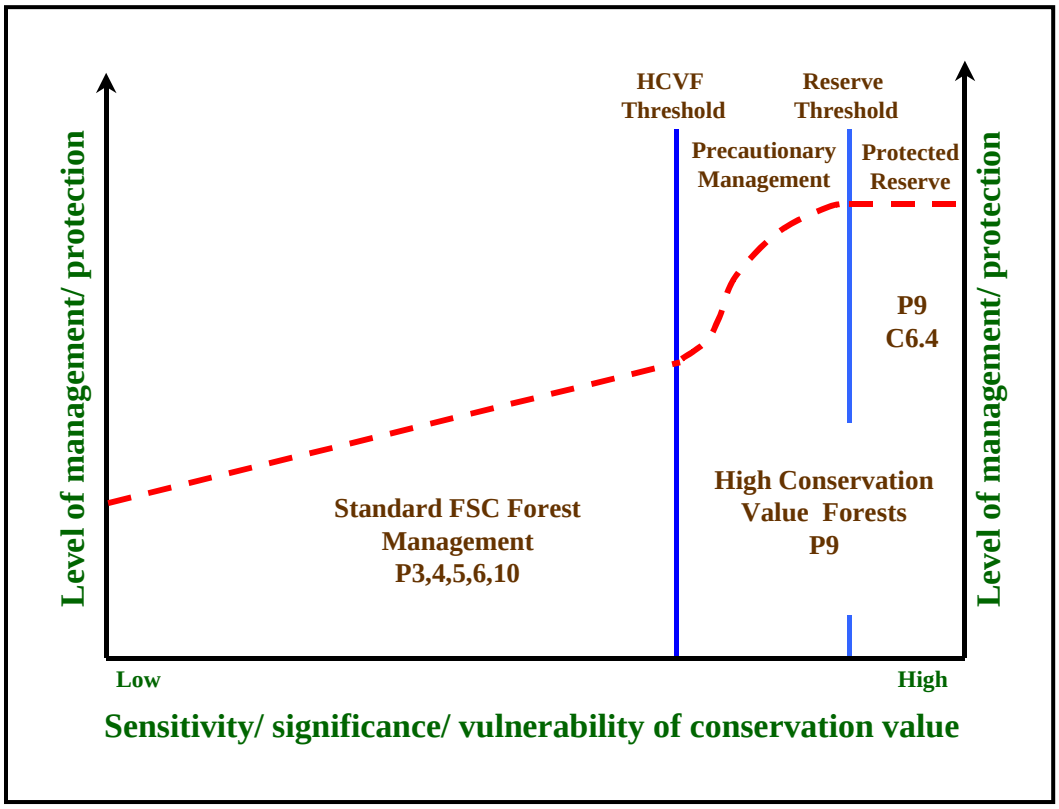
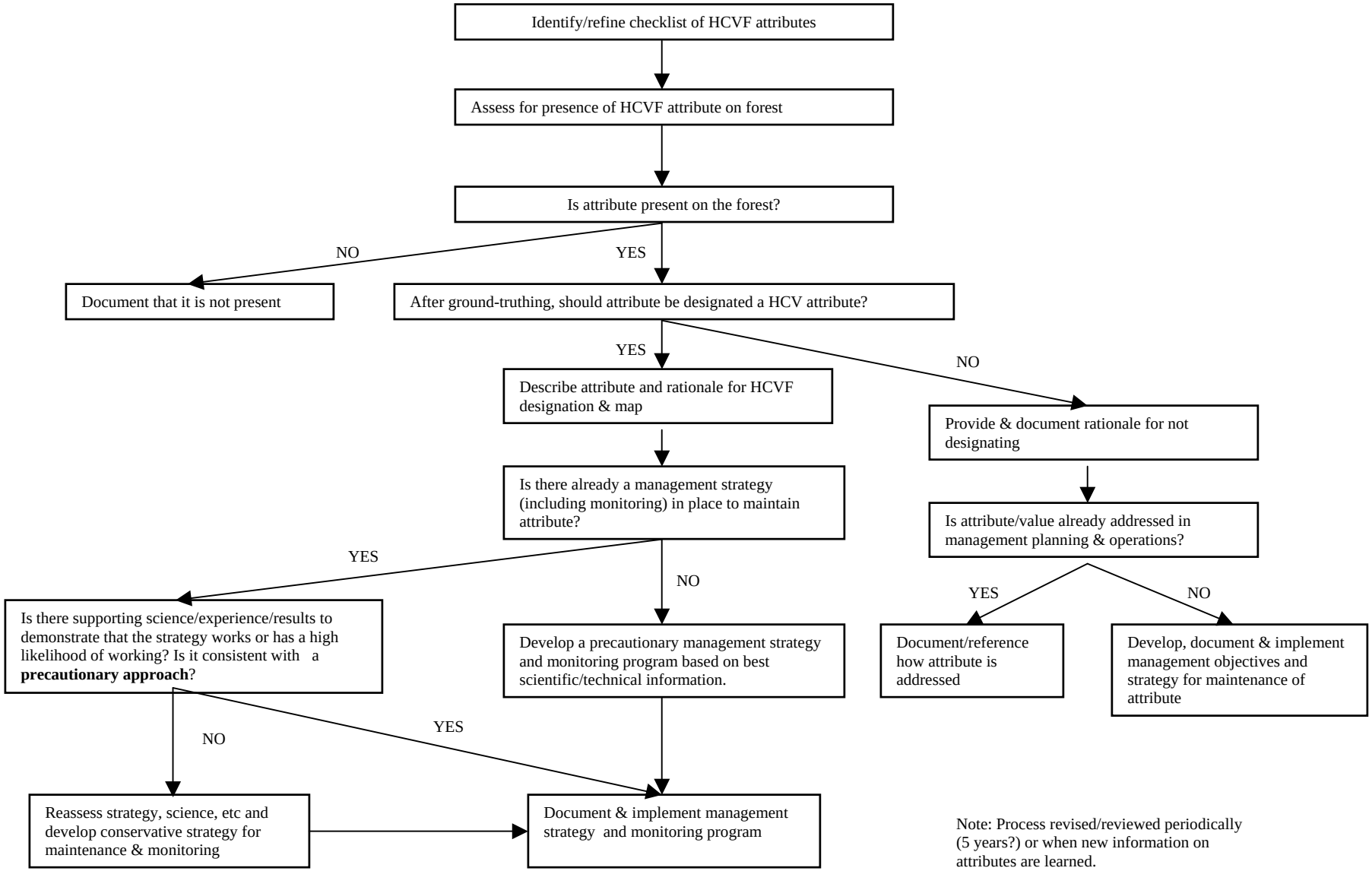


Figure 1. Schematic diagram indicating the differences between HCVFs and non-HCVFs in relation to the sensitivity and significance of conservation values and the level of management or protection required.

[3] Draft Principle 9 Advisory Panel Recommendation Report Version 1.2, March 2001, Forest Stewardship Council.

Figure 2. Process Flow Chart for Meeting P9 Requirements



FSC-BC Checklist for Assessment of High Conservation Values and Identification of HCV Forests

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
Category 1) Forest areas containing globally, nationally or regionally significant concentrations of biodiversity values.			
1. Does the forest [4] contain species at risk or potential habitat of species at risk as listed by international, national or territorial/provincial authorities?	Ensures the maintenance of vulnerable and/or irreplaceable elements of biodiversity. This indicator allows for a single species or a concentration of species to meet HCV thresholds.	*Global*: CITES (Appendix I and II AND III)[i], IUCN red data list[ii], Conservation Date Centre[iii] G1 and G2 element occurrences. *Regional/national*: Species designated as rare, threatened or endangered by provincial, territorial or national legislation (e.g., provincial red lists and COSEWIC[iv] list in Canada). Information is managed in each province by Conservation Data Centres. The list of focal and species representative of habitat types naturally occurring in the **management unit** is determined or reviewed by qualified ecologists (specialists). *Background information*: WWF **Ecoregion** Conservation Assessment[v].	- Are there any rare, threatened or **endangered species** in the forest, or potential **critical habitat** for those species?(DEFINITIVE) - Are there any ecological or taxonomic groups of rare species that would together constitute a HCV? (GUIDANCE) *For example, the presence of a complete assemblage of species with critical ecological functions or taxonomic or evolutionary status (e.g., top predators, a suite of closely related rare species) which included a given number of threatened or **endangered species** might be considered more important than the same (or a higher) number of **threatened species** from a wide range of ecological or taxonomic groupings.* - Do any of the identified rare, threatened or **endangered species** (individually or concentration of species) have a sensitivity to forest operations? (GUIDANCE)
2. Does the forest contain	Ensures the	Range and population estimates from	- Does the forest include or lie within a globally significant

[4] "Forest" refers to forest areas within the **management unit** seeking certification. It does not refer to areas outside the **management unit** (e.g. forests in adjacent protected areas).

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
a globally, nationally or regionally significant concentration of endemic species?	maintenance of vulnerable and/or irreplaceable elements of biodiversity. Endemic species are more likely to be addressed under Principle 6 because their range/extent is geographically restricted. Hence, meeting the threshold of "critical and/or outstanding" likely requires a concentration of endemic species.	national or **local** authorities and **local** experts for rare and endemic species. Background information: WWF **Ecoregion** Conservation Assessment (www.panda.org). Conservation International 'hotspot' areas [vi] (www.conservation.org)	centre of endemism? (DEFINITIVE – Sources include WWF Global 200 **Ecoregion**s and Conservation International Hot Spots.) - Is there a concentration of endemic species in the forest that includes species representative of habitat types naturally occurring in the **management unit**? (DEFINITIVE) - Are there any ecological or taxonomic groups of endemic species or sub-species that would together constitute a globally or nationally significant concentration? (GUIDANCE) *For example, refugia during glacial periods (Yukon interior plateau, portions of Vancouver Island), Pleistocene relics (shores of Lake Superior) and geographically isolated areas that may have promoted genetic drift in certain species (e.g., wolves on mainland coastal (Central Coast) British Columbia) may fall into this category.* - Do any of the identified endemic species have a demonstrated sensitivity to forest operations? (GUIDANCE) - Does the forest contain **critical habitat** of species identified in the above questions? (GUIDANCE)
3. Does the forest include **critical habitat** containing globally, nationally or regionally significant seasonal concentration of species (one or several species, e.g., concentrations of wildlife in breeding sites, wintering sites, migration sites, migration routes or corridors –latitudinal as well as altitudinal, watershed level forests or	Addresses wildlife habitat requirements critical to maintaining population viability (regional "hot spots").	*Global*: BirdLife International[vii], Audubon Society.[viii] Conservation International *Regional/national*: National and **local** agencies with responsibility for wildlife conservation; Results from habitat models **Local** experts, **traditional knowledge** Bird Studies Canada.[ix] Ducks Unlimited Canada[x]	- Is there a concentration of species in the forest that is unusually high compared to the surrounding landscape? (DEFINITIVE) - Is there an IBA (Important Bird Area) in the forest? (DEFINITIVE) - What proportion of the global, national or regional population (i.e., > 1% is the threshold used in the RAMSAR Convention) uses the wildlife concentration area (i.e., to determine importance for species persistence)? (GUIDANCE) - Are there similar wildlife concentration areas within the region? How protected are they? (GUIDANCE) - Is it a wildlife concentration area for more than one species? (GUIDANCE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
riparian forests associated with high value fisheries habitat)?			- Are there any landscape features or habitat characteristics that tend to correlate with significant temporal concentrations of species (e.g., where species occurrence data is limited)? (GUIDANCE) - Are there any ecological or taxonomic groups of species or sub-species that would together constitute a regionally significant concentration? (GUIDANCE)
4. Does the forest contain **critical habitat** for regionally significant species (e.g., species representative of habitat types naturally occurring in the **management unit**, focal species, species declining regionally, including concentrations of aquatic species whose habitat is dependent on riparian forest or watershed condition)?	Population and meta-population viability	Regionally significant species are determined using the sources below. 1. Conservation Data Centre G3, S1-S3 species and communities 2. Range and population estimates from national or **local** authorities and **local** experts for: • red- and blue-listed species (see sources above); • species at risk (in existing legislation and/or policy); • results from habitat models, • species representative of habitat types naturally occurring in the **management unit** or focal species; and, • species identified as ecologically significant through consultation. The list of focal and species representative of habitat types naturally occurring in the **management unit** is determined or reviewed by qualified ecologists (specialists).	- Is there known **critical habitat** for a regionally significant species (including aquatic spp.)? (DEFINITIVE) - Is the regionally significant species in significant decline as a result of forest management? (DEFINITIVE) - Is the population of regionally significant species locally at risk (e.g., continuing trend is declining rather than stable or improving)? (GUIDANCE)
5. Does the forest support concentrations of species at the edge of	Relevant conservation issues include vulnerability against	*Range and population estimates from national or **local** authorities and **local** experts for:*	Are any of the range edge or outlier species a focal species or species otherwise representative of habitat types naturally occurring in the **management unit** ? (DEFINITIVE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
their natural ranges or outlier populations?[xi]	range contraction and potential genetic variation at range edge. Outlier and edge of range populations may also play a critical role in genetic/population adaptation to global warming.	• red- and blue-listed species (see sources above), • focal species, • major forest (tree species) types, and • species identified as ecologically significant through consultation. The list of focal and species representative of habitat types naturally occurring in the **management unit** is determined or reviewed by qualified ecologists (specialists).	- Are there any ecological or taxonomic groups of range edge and/or outlier species/sub-species that would together constitute a globally, nationally or regionally significant concentration? (GUIDANCE) - Are the species potentially negatively impacted by forest management? (GUIDANCE) - Are there naturally occurring outlier populations of commercial tree species? (GUIDANCE)
6. Does the forest lie within, adjacent to, or contain a conservation area: a) designated by an international authority, b) legally designated or proposed by relevant federal/provincial/ territorial legislative body, or c) identified in regional land use plans or conservation plans.	Ensures compliance with the conservation intent of a conservation area and that regionally significant forests are evaluated for consistency with the conservation intent. (Note: Conservation areas that are withdrawn from industrial activity do not constitute HCV for management purposes, but their values may need to be maintained or enhanced in adjacent or buffer areas.)	International designations include: UNESCO World Heritage Sites[xii] RAMSAR sites[xiii] International Biological Program sites Legally designated sites in Canada/BC: CCAD (available from GeoGratis) WWF Designated Areas Data Base MSRM Areas under deferral pending completion of land use planning and-or completion of protected areas system. **Local** government land use plans. Other conservation planning exercises (e.g., WWF-Canada conservation suitability analysis). Where there is conflicting information regarding the location and/or conservation status of a conservation area designated by an international authority, then the forest **manager** should assume that the forest contains HCVs.	- Are the values for which the conservation area has been identified consistent with the assessment of HCVs in this framework? (DEFINITIVE) - Do permitted uses in the conservation area include industrial activities (i.e., not legally withdrawn from industrial activity; e.g., not IUCN category I or II)? (GUIDANCE) - Are there forest areas important to connect conservation areas in order to maintain the values for which the conservation areas were identified? (GUIDANCE) - Are there forest areas important to buffer conservation areas in order to maintain the values for which the conservation areas were identified? (GUIDANCE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
Category 2) Forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.			
7. Does the forest constitute or form part of a globally, nationally or regionally significant forest landscape that includes populations of most **native species** and sufficient habitat such that there is a high likelihood of long-term species persistence?	The forest must not only be large enough to potentially support most or all **native species**, but long-term, large-scale natural disturbances can take place without losing their resilience to maintain the full range of **ecosystem** processes and functions (i.e., naturally functioning landscape).	Permanent infrastructure data from government sources or forest companies; Global sources include: Digital Chart of the World Global Forest Watch for selected forest regions. Appropriate scale (stand level) of vegetation inventories; Habitat suitability models. Forest inventories of harvests or other depletions; Non-permanent roads; Exploration activity (e.g., seismic, drilling).	Are there forest landscapes unfragmented by permanent infrastructure and of a size (depending on scale) to maintain viable populations of most species? (DEFINITIVE) *Example thresholds for boreal forests:* - *Globally significant threshold > 500,000 ha and free of permanent infrastructures/roads and < 1% non-permanent human disturbances;* - *Nationally significant threshold 200,000 to 500,000 ha free of permanent infrastructures/road and < 5% of non-permanent human disturbances;* - *Regionally significant threshold 50,000 to 200,000 ha and free of permanent infrastructures and < 5% non-permanent human disturbances;* - *Regionally significant threshold could drop to 10,000 ha in landscapes with extensive development history (see #10 below)* - To assist in the development of management prescriptions, the description of the high conservation value should go beyond size and also include measures of forest quality to be maintained or enhanced for the persistence of **native species**. Aspects of forest quality may include, but need not be limited to, the two sets of guidance questions below. If unfragmented forest landscapes do not meet the size thresholds above, then there are no large landscape level forest HCVs. In this situation, remnant intact forest landscapes may be identified as part of Item #10. - Do the unfragmented forest landscapes include a sufficient range in habitat types and sufficient area of suitable habitat for **native species**? (GUIDANCE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
			- *Do the unfragmented forest landscapes include known populations of* species representative of habitat types naturally occurring in the **management unit** sufficient for their *long-term persistence (i.e., > 100 years)?* - *Do the unfragmented forest landscapes include a seral stage distribution that is within RONV?* - Are the levels of road density and habitat fragmentation sufficiently low within the large unfragmented forest landscapes to permit the persistence of most **native species**? (GUIDANCE) - *Are densities of non-permanent (e.g., tertiary) roads below levels cited in the scientific literature for a naturally functioning landscape?* - *Are levels of forest conversion and/or alteration of seral stage distribution resulting from human activities below levels appropriate for a naturally functioning landscape?* -Are the unfragmented landscape sufficiently large or isolated from human development to allow for continued functioning of **natural disturbance regime**s and patterns?
Category 3) Forest areas that are in or contain rare, threatened or endangered ecosystems.			
8. Does the forest contain naturally rare **ecosystem** types?	These forests contain many unique species and communities that are adapted only to the conditions found in these rare forest types.	Conservation Data Centre G1-G3 community types; WWF **Ecoregion** Conservation Assessments; Conservation International National vegetation surveys and maps; **Local** Research institutions Authorities on Biodiversity (e.g., NatureServe, Infonatura)	- Are there **ecosystem**s that have been officially classified as being rare, threatened or endangered by a relevant national or provincial organization? (DEFINITIVE) - Is a significant amount of the global extent of these **ecosystem**s present in the country and/or **ecoregion**? (GUIDANCE) - Are these **ecosystem**s potentially negatively impacted by forest management? (GUIDANCE)
9. Are there **ecosystem** types or **ecosystem** type conditions within the	Vulnerability and meta-population viability.	Relevant government authorities; WWF **Ecoregion** Conservation Assessments;	- Does the forest consist of mature and/or old forest stands, where the amount of old forest remaining in that BEC **variant** has been reduced to less than 50% of estimated

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
forest or **ecoregion** that have significantly declined, or under sufficient present and/or future development pressures that they will likely become rare in the future (e.g., old seral stages)?	Naturally occurring seral stage distributions are an essential element of habitat management This indicator includes anthropogenically rare forest **ecosystem** types (e.g., late seral forests).	Suitable forest or vegetation inventories; Potential vegetation mapping; Regional and **local** experts; Conservation Data Centre S1-S3 community types.	natural occurrence of old forest? (DEFINITIVE) - Have these **ecosystem**s significantly declined (e.g., > 50% loss)? (GUIDANCE) - Is there a significant proportion of the declining **ecosystem** type within the **management unit** in comparison to the broader **ecoregion**? (GUIDANCE) - Does potential vegetation mapping identify areas within the **management unit** that can support the declining **ecosystem** type (i.e., regeneration potential)? (GUIDANCE) - How well is each **ecosystem** effectively secured by the protected area network and the national/regional legislation? (GUIDANCE)
10. Are there ecosystems, that are poorly represented in protected areas, and likely to become rare in an intact state due to ongoing human activities?	Maintenance of benchmarks or controls are essential to responsible management	MSRM data on protected area representation	Does that **management unit** contain intact or undeveloped watersheds over 5,000 ha in size containing **ecosystem**s that are under-represented in protected areas (e.g., BEC **variants** with <10% representation)? (DEFINITIVE) Where there are no intact watersheds over 5,000 ha containing under-represented elements, are there smaller watersheds or other ecologically significant areas that contain those elements? (GUIDANCE) Does the **management unit** contain **ecosystem**s that are under-represented in protected areas (<10% by BEC **variant**, **site series** or groups of **site series**)? (GUIDANCE)
11. Are large landscape level forests (i.e., large unfragmented forests) rare or absent in the forest or **ecoregion**?	In regions or forests where large functioning landscape level forests are rare or do not exist (highly fragmented forest), many of the remnant forest patches require consideration as potential HCVs (i.e., best of the rest).	Global Forest Watch intactness mapping: Forest cover data provided by companies/government.	- Are moderate to large remnant patches (thousands of hectares) the best examples of intact forest for their community and landform types? (GUIDANCE) - Do the intact remnant patches include a logical ecological unit (e.g., a watershed, sub-basin, a group of home ranges)? - Do the largest remnant forest patches include a significant proportion of late seral stands (i.e. old forests)? (GUIDANCE) - Do the remnant forest patches include a significant proportion of structural features such as woody debris and

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
	Identifies remnant forest patches/blocks where unfragmented (by permanent infrastructure) landscapes do not exceed size thresholds.		standing dead trees (i.e., structurally complex)? (GUIDANCE) - Do the largest remnant forest patches include known populations of species representative of habitat types naturally occurring in the **management unit**, especially access-sensitive species? (GUIDANCE)
12. Are there nationally /regionally significant diverse or unique forest **ecosystem**s, forests associated with unique aquatic **ecosystem**s?	Vulnerability; species diversity; significant ecological processes.	Relevant government authorities; WWF **Ecoregion** Conservation Assessments; Regional environmental background studies.	- Are there important and/or unique geological areas that strongly influence vegetation cover (e.g., serpentine soils, marble outcrops)? (GUIDANCE) - Are there important and/or unique microclimatic conditions that strongly influence vegetation cover (e.g., high rainfall, protected valleys)? (GUIDANCE) - Do these **ecosystem**s possess any exceptional characteristics (including exceptional species richness, critical species, etc.)? (GUIDANCE)
Category 4) Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).			
13. Does the forest contribute to maintaining the quality, quantity and seasonal timing for water flows that are a source of drinking water, irrigation water or water for a critical economic activity?	The potential impact to human communities is so significant as to be 'catastrophic' leading to significant loss of productivity, or sickness and death, and there are no alternative sources of drinking water. Availability of high quality water may be critical to agriculture or	The forest **manager** should obtain the information from the relevant authorities (resource management studies, relevant economic development studies, traditional occupancy studies, regional land use plans, etc.) to determine if the wrong actions or management could cause serious cumulative or catastrophic impacts on these basic services. Sources of information include **First Nation**s communities, **local** communities, **local** organizations and enterprises, British Columbia Ministry of Water,	- Is the watershed or recharge area critical to maintaining the quality, quantity and seasonal flows of the primary drinking water source for a community or group of individuals? (DEFINITIVE) Is the watershed or recharge area critical to maintaining the quality, quantity and seasonal flows of agricultural irrigation water sources, or water for other significant economic activities? (GUIDANCE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
	other economic activities	Land and Air Protection, British Columbia Ministry of Forests, British Columbia Ministry of Sustainable Resource Management, and **local** and regional government.	
14. Are there forests that provide a significant ecological service in mediating flooding and/or drought, controlling stream flow regulation, and water quality?	Forest areas play a critical role in maintaining water quantity and quality and the service breakdown has catastrophic impacts or is irreplaceable.	Hydrological maps; Hydrologists in government departments or local research institutions.	- Are there high risk areas for flooding or drought? (DEFINITIVE) - Are there particular forest areas (i.e., a critical sub-watershed) that potentially affect a significant or major portion of the water flow (e.g., 75% of water in a larger watershed is funneled through a specific catchment area or river channel)? (GUIDANCE) - Does the forest occur within a sub-watershed that is critically important to the overall catchment basin? (GUIDANCE) - Are there particular forest areas (i.e., a critical sub-watershed) that potentially affect water supplies for other services such as reservoirs, irrigation, river recharge or hydroelectric schemes? (GUIDANCE)
15. Are there forests critical to erosion control?	Soil, terrain or snow stability, including control of erosion, sedimentation, landslides, or avalanches.	Maps, remote sensing data, aerial photos, Governmental departments, Consultation with relevant experts.	- Are there forest areas where the degree of slope carries high risk of erosion, landslides and avalanches? (DEFINITIVE) - Are there soil and geology site types that are particularly prone to erosion and terrain instability? (GUIDANCE) - Is the spatial extent of erosion-prone or unstable terrain such that the forest is at high risk (also of cumulative impacts)? (GUIDANCE)
16. Are there "interface" forests that play a significant role determining the potential spread of wildfires into developed areas, or other areas where fire would be harmful?	Management of interface forests can significantly affect the potential spread of wildfires	Ministry of Forests and **local** communities fire interface plans	- Are there forest areas where there is a high risk of uncontrolled, destructive fire and in which forest areas or forest types can act as a barrier to the spread of these fires? - Do these forest areas contain or are adjacent to human settlements or communities that would be at risk from uncontrolled, destructive forest fire? - Do these forest areas contain or are adjacent to places of important cultural value that would be severely damaged or destroyed by uncontrolled fire (e.g., sacred places,

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
			archaeological sites)? - Do these forest areas contain or are adjacent to protected areas that contain threatened or **endangered species** or **ecosystem**s?
Category 5) Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health).			
17. Are there **local** communities that use the forest? (This should include both people living inside the forest area and those living adjacent to it as well as any group that regularly visits the forest.) - Is anyone within the community making use of the forest for basic needs/ livelihoods? (Consider food, medicine, fodder, fuel, building and craft materials, water, income). If it is not possible to say that it is NOT fundamentally important, then assume that it is.) (Look at members or subgroups rather than treating the community as homogeneous.)	There is a distinction being made between the use by individuals (i.e., traplines) and where use of the forest is fundamental for **local** communities.	Sources of information 1. Consultation with the communities themselves is the most important way of collecting information. 2. Literature sources such as reports and papers, where available, can be very useful sources of information. 3. Knowledgeable people and organizations such as **local** community organizations, NGOs, or academic institutions. This type of group can often provide a quick introduction to the issues and provide support for further work. 4. Review of studies of traditional land use and non-timber use of the forest. 5. Review of socio-economic profiles of communities. Sources of information include **First Nation**s communities, **local** communities, **local** organizations and enterprises, British Columbia Ministry of Sustainable resource Management, British Columbia Ministry of Forests, and **local** and regional government.	Having established that the community uses the forest to fulfill some needs it is now necessary to assess whether it is fundamental to meeting any basic needs. The way that this will be done will be enormously variable, depending on the socio-economic context and the need. However, it will always involve consultation with the community itself. The following are general guidance questions to assess whether the value meets HCV thresholds. - Is this the sole or a significant source of the value(s) for the **local** communities? (GUIDANCE) - Is there a significant impact to the **local** communities as a result of a reduced supply of these values? (GUIDANCE) - Are there values that, although they may be a small proportion of the basic needs, are nevertheless critical? (GUIDANCE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
Category 6) Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).			
18. Is the traditional cultural identity of the **local** community particularly tied to a specific forest area?	See FSC-BC standards glossary for definition of **local**	Sources of information 1. Consultation with the communities themselves is the most important way of collecting information. This is also a difficult thing to do and may require professional help in the planning or implementation. 2. Knowledgeable people and organizations such as **local** community organizations or academic institutions. This type of group can often provide a quick introduction to the issues and provide support for further work. 3. Literature sources such as reports and papers, where available, can be very useful sources of information. 4. Review studies of traditional land use and non-timber use of the forest. 5. Review of socio-economic profiles of communities. 6. Review of websites, community promotional material, brochures, etc.	- Do the communities consider that the forest is culturally significant? (This can only be identified in co-operation with **local** communities. This requires the forest **manager** to consult with local communities. Where consultation is not possible then you must assume it is culturally significant). Possible indicators for cultural importance include: 1. Names for landscape features; 2. Stories about the forest; 3. Sacred or religious sites; 4. Historical associations; and, 5. amenity or aesthetic value. The difference between having some significance to cultural identity and being critical will often be a difficult line to draw and as with meeting basic needs, the way in which it is established will be very variable. However, some key points to consider are: • To be an HCV, the forest must be **critical** to the culture. • For FSC certification **all** identified values must be addressed even if they are not critical, but will be dealt with under other principles. Two potential indicators for critical: 1. Will changes to the forest potentially cause an irreversible change to the culture? (GUIDANCE) 2. Is the particular forest in question more valuable than other forests? (GUIDANCE)
19. Is there a significant overlap of values	Consideration of several spatially	Neighbourhood analysis can be used to summarize point values (e.g., species	- Are there several overlapping conservation values? (GUIDANCE)

Item	Rationale	Possible Sources	Criteria and Guidance for assessing HCV
(ecological and/or cultural) that individually did not meet HCV thresholds, but collectively constitute HCVs?	overlapping values is important in optimizing conservation management. Individual values that do not meet the threshold for critical and/or outstanding may collectively meet the threshold.	occurrences, feeding areas, mineral licks, spawning areas) within a spatial window of a size that is relevant for the **ecosystem** type and values under consideration. If concentration of single values was not undertaken in any of the previous steps (e.g., S1-S3 species occurrences) then include this in the analysis. Overlays of multiple values to assess spatial coincidence.	- Do the overlapping values represent multiple themes (e.g., species distribution, significant habitat, concentration area, relatively unfragmented landscape)? (GUIDANCE) - Are the overlapping values within, adjacent to, or in close proximity to an identified HCV or existing conservation area? (GUIDANCE) - Are the overlapping values adjacent or in close proximity to an existing protected area or candidate for permanent protection? (GUIDANCE) - Do the overlapping values provide an option to meet protected areas representation requirements (i.e., overlap an under-represented landscape as assessed using a protected areas gap analysis)? (GUIDANCE)

Appendix E: List of Publications Referred to in the Standards

BC Ministry of Forests. Forest Practices Code Guidebooks: available on the web at: http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/Guidetoc.htm

- Mapping and Assessing Terrain Stability 1999
- Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes 1999
- Soil Conservation 2001
- Soil Conservation Surveys 2001
- Soil Rehabilitation 1997.
- Channel Assessment Procedure Field Guidebook 1996
- Biodiversity 1995

BC Ministry of Forests and BC Ministry of Environment, Lands and Parks. 1998. Riparian assessment and prescription procedures. Watershed Restoration Program Tech. Circular No. 6. MoF and MELP. Victoria, BC

BC Ministry of Forests and BC Ministry of Environment, Lands and Parks. 1995. The **Riparian Management Area** Guidebook. MoF and MELP. Victoria, BC.

BC Ministry of Forests and BC Ministry of Environment, Lands and Parks. 1996. Channel Assessment Procedure Guidebook and Field Guidebook. MoF and MELP. Victoria, BC

BC Ministry of Forests and BC Ministry of Environment, Lands and Parks. 1999. Coastal Watershed Assessment Procedure Guidebook (CWAP) : Interior watershed assessment procedure guidebook (IWAP) – second edition. MoF and MELP. Victoria, BC.

BC Ministry of Forests and BC Ministry of Environment, Lands and Parks. 1996. Lake Classification and Lakeshore Management Guidebook: Nelson Forest Region. MoF and MELP. Victoria, BC.

Bibby, C.J. 1992. Putting biodiversity on the map: Priority areas for global conservation. Washington, D.C.: Integrated conservation and Development Project (ICDP).

Carver, M. and D. Putt 1999. Channel assessment and sediment source review with rehabilitation prescriptions - Ross, North Aylmer, and South Aylmer Creeks, Queen's Bay Area. Unpubl. report for Meadow Creek Cedar Ltd. Nelson, BC. 23pp. Appds.

Carver, M. 2001. Riparian Forest Management for Protection of Aquatic Values: Literature Review and Synthesis. Unpubl. report for FSC-BC. Nelson, BC. 48 pp.

Clayoquot Sound Scientific Panel. 1995. Sustainable Ecosystem Management in Clayoquot Sound: Planning and Practices. Report 5, Province of BC. Victoria, BC. 296pp. Appds.

Curran, M., I. Davis, and B. Mitchell. 2000. Silviculture Prescription Data Collection Field Handbook - Interpretive Guide for Data Collection, Site Stratification, and Sensitivity Evaluation for Silviculture Prescriptions. Land Management Handbook 47. Province of B.C. Victoria, B.C.

Draft Principle 9 Advisory Panel Recommendation Report Version 1.2, March 2001, Forest Stewardship Council

Howes, D.E. and Kenk, E. 1997. Terrain Classification System for British Columbia. MOE Manual 10 (version2). Fisheries Branch, Ministry of Environment; Surveys and Resources Mapping Branch, Ministry of Crown Lands, Province of British Columbia. 102 p.

Resources Inventory Committee, 1995. Guidelines and Standards for Terrain Mapping in British Columbia. Province of B.C. Victoria.

Ricketts, Taylor, Dinerstein, Olson, Loucks et al. 1999. Terrestrial Ecoregions of North America, a conservation assessment, World Wildlife Fund/United States and Canada, Island Press.

Utzig, G.F., P.Ag., Holt, R.F., R.P.Bio. August 15, 2000 Forest Stewardship Council BC Regional Initiative Principle 9 Technical Consultation Background Paper

General References for Glossary:

Dunster, J. and K Dunster. 1996. Dictionary of Natural Resource Management. UBC Press. Vancouver, B.C.

Ministry of Forests Glossary – website link
http://www.for.gov.bc.ca/PAB/PUBLCTNS/GLOSSARY/GLOSSARY.HTM

FSC Publications

FSC-AC, February 2000. FSC Principles and Criteria

FSC-AC Policies – for up-to-date versions please consult:

http://fsc.org/fsc/about/documents/Docs_cent/2

[i] CITES (Convention on International Trade in Endangered Species). All species that are listed on Appendix I and II can be found at: http://www.cites.org/eng/append/index.shtml

[ii] IUCN Red Data Lists of Threatened Species can be found at: http://www.iucn.org/themes/ssc/red-lists.htm

[iii] Most provinces run Conservation Data Centres (CDCs) which maintain records of occurrences of internationally, federally and provincially listed species. The information is usually stored in a central repository containing a computerized **database**, map files and an information library, which are accessible for conservation applications, land use planning, park management, etc.

[iv] Information on Canadian federally listed species can be obtained at: http://www.cosewic.gc.ca/index.htm

[v] WWF Global 200 Ecoregions. Globally important ecoregions defined on the basis of species richness; endemism; higher taxonomic uniqueness; extraordinary ecological or evolutionary phenomena and global rarity of the major habitat type. Information can be found at
http://www.panda.org/resources/programmes/global200/pages/mainmap.htm

[vi] Conservation International 'hotspots' are areas that contain outstanding levels of endemism and that have suffered high levels of habitat loss. Information available at www.conservation.org/xp/CIWEB/strategies/hotspots/hotspots.xm

[vii] BirdLife International provides maps and lists of Important Bird Areas. Current level of coverage varies between regions and in countries within regions. Information (including data sources), can be found at http://www.birdlife.net/sites/index.cfm

[viii] Audubon Society. Information on Important Bird Areas in America can be found at: http://www.audubon.org/bird/iba/index.html

[ix] Bird Studies Canada maintains information on identified Important Bird Areas at: http://www.bsc-eoc.org/iba/IBAsites.html or http://www.ibacanada.com/

Integrating Indigenous Knowledge in Project Planning and Implementation.
PDF format:
http://www.acdi-cida.gc.ca/cida_ind.nsf/852562900065549a85256250006cbb1a/57ed1d990f2ac9be85256b21004b12de/$FILE/IndiKnow-NP-e.pdf

Indigenous Peoples' Secretariat (Canada) on the Convention on Biological Diversity, Place Vincent Massey, 9th Floor, 351 St. Joseph Blvd., Hull, PQ K1A 0H3 Canada. Tel: 819.953.5819, Fax: 819.953.1765, tamara.dionnestout@ec.gc.ca

[x] Ducks Unlimited Canada: http://www.ducks.ca/

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

[xii] UNESCO World Heritage Sites. Information can be obtained from: http://www.unesco.org/whc/nwhc/pages/sites/main.htm

[xiii] RAMSAR sites. Maps of wetlands of international importance in Canada can be obtained from: http://www.wetlands.org/profiles_canada.htm

Additional References:

http://www.geogratis.cgdi.gc.ca/frames.html - Canada Watershed Maps

http://www.eman-rese.ca/ - Ecological Monitoring and Assessment Network

http://www.cws-scf.ec.gc.ca/index_e.cfm – Canadian Wildlife Service

http://toporama.cits.rncan.gc.ca/ - Toporama (graphics files)

http://earthtrends.wri.org/ - World Resources International

http://www.cnf.ca/ - Canadian Nature Federation