



**CSA
Group**

CAN/CSA-Z809-16
National Standard of Canada
(approved September 2016)

Sustainable forest management



**Standards Council of Canada
Conseil canadien des normes**

Legal Notice for Standards

Canadian Standards Association (operating as “CSA Group”) develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document’s fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party’s intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group’s and/or others’ intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.



Revision History

Z809-16, Sustainable forest management

National Standard of Canada — September 2016
Outside front cover, National Standard of Canada text, title page, and preface.

Standards Update Service

CAN/CSA-Z809-16

March 2016

Title: *Sustainable forest management*

To register for e-mail notification about any updates to this publication

- go to shop.csa.ca
- click on **CSA Update Service**

The **List ID** that you will need to register for updates to this publication is **2424363**.

If you require assistance, please e-mail techsupport@csagroup.org or call 416-747-2233.

Visit CSA Group's policy on privacy at www.csagroup.org/legal to find out how we protect your personal information.

Canadian Standards Association (operating as “CSA Group”), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group’s standards development by volunteering their time and skills to Committee work and supporting CSA Group’s objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group’s total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group’s standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada



A National Standard of Canada is a standard developed by an SCC-accredited Standards Development Organization (SDO), and approved by the Standards Council of Canada (SCC), in accordance with SCC’s *Requirements and Guidance — Accreditation for Standards Development Organizations*, and *Requirements and Guidance — Approval of National Standards of Canada Designation*. More information on National Standard requirements can be found at www.scc.ca.

An SCC-approved standard reflects the consensus of a number of experts whose collective interests provide, to the greatest practicable extent, a balance of representation of affected stakeholders. National Standards of Canada are intended to make a significant and timely contribution to the Canadian interest.

SCC is a Crown corporation within the portfolio of Industry Canada. With the goal of enhancing Canada’s economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts. Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Users should always obtain the latest edition of a National Standard of Canada from the standards development organization responsible for its publication, as these documents are subject to periodic review.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada



Cette Norme Nationale du Canada est disponible en versions française et anglaise.

Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users to judge its suitability for their particular purpose.

™A trade-mark of the Canadian Standards Association, operating as “CSA Group”

*National Standard of Canada
(approved September 2016)*

CAN/CSA-Z809-16
Sustainable forest management

Prepared by



*®A trademark of the Canadian Standards Association,
operating as "CSA Group"*

Approved by



*Published in March 2016 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at shop.csa.ca
or call toll-free 1-800-463-6727 or 416-747-4044.*

*ICS 01.040.13; 03.120.01; 03.120.10
ISBN 978-1-4883-0311-1*

*© 2016 CSA Group
All rights reserved. No part of this publication may be reproduced in any form whatsoever
without the prior permission of the publisher.*

Contents

Technical Committee on Sustainable Forest Management	3
Preface	6
0 Introduction	7
0.1 General	7
0.2 High degree of public involvement	7
0.3 CCFM SFM criteria and elements as the basis of the SFM performance requirements	8
0.4 Performance requirements	9
0.5 Conformance with ISO (International Organization for Standardization) Standards	9
0.5.1 Development of CSA Group standards	9
0.5.2 Environmental management systems	9
0.6 Expected future conditions	9
0.7 Continual improvement	10
0.8 Third-party independent audits	10
0.9 Transparency	10
1 Scope	10
2 Reference publications	11
3 Definitions and abbreviations	13
3.1 Definitions	13
3.2 Abbreviations	18
4 Sustainable forest management requirements	18
4.1 General requirements	18
4.2 Required activities	18
5 Public and Aboriginal participation requirements	18
5.1 General requirements	18
5.2 Interested parties	18
5.3 Process: Basic operating rules for advisory groups	19
5.4 Work of the advisory group	19
5.5 Public communication	20
6 SFM performance requirements	20
6.1 DFA-specific performance requirements	20
6.2 SFM criteria — General	21
6.3 SFM criteria, elements, and core indicators	21
6.3.1 Criterion 1 — Biological diversity	21
6.3.2 Criterion 2 — Ecosystem condition and productivity	23
6.3.3 Criterion 3 — Soil and water	23
6.3.4 Criterion 4 — Role in global ecological cycles	24
6.3.5 Criterion 5 — Economic and social benefits	25
6.3.6 Criterion 6 — Society's responsibility	26
6.3.7 Criterion 7 — Aboriginal relations	26

7 SFM system requirements	27
7.1	General 27
7.2	SFM policy 27
7.3	Planning 27
7.3.1	Defined forest area 27
7.3.2	Defined responsibilities 28
7.3.3	Rights and regulations 28
7.3.4	Incorporation of public participation requirements 28
7.3.5	SFM plan 28
7.4	Implementation and operation 29
7.4.1	Structure, responsibility, and resources 29
7.4.2	Competence, training, and knowledge 29
7.4.3	Communication 29
7.4.4	SFM documentation 29
7.4.5	Document control 29
7.4.6	Operational procedures and control 30
7.4.7	Emergency preparedness and response 30
7.5	Checking and corrective action 30
7.5.1	Monitoring and measurement 30
7.5.2	Corrective action 30
7.5.3	Records 30
7.6	Management review 30
7.7	Group certification requirements 31
7.7.1	Basic requirements 31
7.7.2	Group entity responsibilities 31
7.7.3	Group participant responsibilities 31

Annex A (informative) — Guidance for implementation and certification	33
Annex B (informative) — Certification framework	75
Annex C (informative) — Bibliography	78

Technical Committee on Sustainable Forest Management

D. Roddy	Roddy Resources Inc, Spruce Home, Saskatchewan <i>Category: Environment and General Interest</i>	<i>Chair</i>
P.N. Duinker	Dalhousie University, Halifax, Nova Scotia <i>Category: Academic and Professional Practitioners Interest</i>	<i>Vice-Chair</i>
K. Atkinson	KDAA Consulting, North Vancouver, British Columbia <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	
D. Bebb	KPMG, Vancouver, British Columbia	<i>Associate</i>
S. Bridge	Canadian Forest Service/Natural Resources Canada, Ottawa, Ontario <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	
J. Cameron	Stillwater Local Public Advisory Group, Powell River, British Columbia <i>Category: Environment and General Interest</i>	
G. Cumming	Algonquin Forestry Authority, Huntsville, Ontario <i>Category: Producer Interest</i>	
V. Day	Canfor, Prince George, British Columbia <i>Category: Producer Interest</i>	
M. de Bellefeuille	Western Forest Products Inc., Campbell River, British Columbia <i>Category: Producer Interest</i>	
N. Dhital	Saskatchewan Ministry of Environment, Prince Albert, Saskatchewan <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	

J. Dunford	Tolko Industries, Kamloops, British Columbia <i>Category: Producer Interest</i>	
B. Eaket	PricewaterhouseCoopers LLP, Vancouver, British Columbia	<i>Associate</i>
D. Gill	Westbank First Nations — Heartland Economic LP, Westbank, British Columbia <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	
C. Harvey	Teal Jones Group, Surrey, British Columbia <i>Category: Producer Interest</i>	
J. Hillard	Consumer Interest Alliance Inc. (CIAI), Winnipeg, Manitoba <i>Category: Environment and General Interest</i>	
D. Janz	BC Wildlife Federation, Nanaimo, British Columbia <i>Category: Environment and General Interest</i>	
M. Johnston	Saskatchewan Research Council, Saskatoon, Saskatchewan <i>Category: Academic and Professional Practitioners Interest</i>	
R. Kahlke	BC Timber Sales, Vernon, British Columbia <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	
N. Klenk	University of Toronto, Toronto, Ontario <i>Category: Academic and Professional Practitioners Interest</i>	
G. Macintosh	SFI Inc., Ottawa, Ontario	<i>Associate</i>
M. Partington	FPInnovations, Pointe-Claire, Québec <i>Category: Academic and Professional Practitioners Interest</i>	

A. Rotherham	T. Rotherham Forest Consulting Inc., Knowlton, Québec <i>Category: Academic and Professional Practitioners Interest</i>	
P. Salm	Nicola Thompson Fraser Local Public Advisory Group, Kamloops, British Columbia <i>Category: Environment and General Interest</i>	
T.S. Szabo	Alberta Innovates Bio Solutions, Edmonton, Alberta	<i>Associate</i>
A. Tikina	University of British Columbia, Vancouver, British Columbia <i>Category: Academic and Professional Practitioners Interest</i>	
B. Wang	Standards Council of Canada (SCC), Ottawa, Ontario	<i>Associate</i>
B. White	Alberta Environment and Sustainable Resource Development, Edmonton, Alberta <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	
P.T. Wooding	PEFC Canada, North Vancouver, British Columbia	<i>Associate</i>
K. Zielke	Forest Practices Board, Victoria, British Columbia <i>Category: Aboriginal Peoples, Government, and Regulatory Authorities Interest</i>	
P. Patel	CSA Group, Toronto, Ontario	<i>Project Manager</i>

Preface

This is the fourth edition of CSA Z809, *Sustainable forest management*. It supersedes the previous editions, published in 2008, 2002, and 1996.

A second standard, CSA Z804, is intended for use by woodlot owners or managers of forests up to 4000 hectares.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the Technical Committee on Sustainable Forest Management, under the jurisdiction of the Strategic Steering Committee on Business Management and Sustainability, and has been formally approved by the Technical Committee.

This Standard has been approved as a National Standard of Canada by the Standards Council of Canada.

Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
- 4) *To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:*
 - a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
 - b) *provide an explanation of circumstances surrounding the actual field condition; and*
 - c) *where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.*

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.
- 5) *This Standard is subject to review five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:*
 - a) *Standard designation (number);*
 - b) *relevant clause, table, and/or figure number;*
 - c) *wording of the proposed change; and*
 - d) *rationale for the change.*

CAN/CSA-Z809-16

Sustainable forest management

0 Introduction

0.1 General

Canada's forests make a significant contribution to our quality of life, the integrity of our environment, and the supply of paper and building materials and other forest products both at home and abroad. Canadian forests comprise diverse forest types and circumstances and support hundreds of forest-dependent communities. The future of our forests is important to all Canadians, including Aboriginal Peoples who have a significant relationship with the land. In addition to complying with legislation, organizations can benefit from using voluntary tools, such as this Standard, to help them achieve sustainable forest management (SFM). This Standard gives organizations a system for continual improvement of their forest management performance and for engaging interested parties in a focused public participation process. Certification to this Standard involves regular and rigorous independent, third-party certification audits.

The federal and provincial/territorial governments in Canada both have regulatory roles in relation to forests. The Constitution Act (1982) places jurisdiction over forests in the remit of the provinces. Each province has a comprehensive set of laws, regulations, and policies covering all aspects of forests and their management. The Government of Canada has legislation covering, among other things, species at risk, migratory birds, fish, aquatic habitat, and water quality. The federal government also has responsibility for Aboriginal treaties, lands, and associated matters. All organizations with responsibility for forest management are required to be in compliance with this comprehensive regulatory framework. The provincial and federal governments monitor compliance with regulatory requirements which, on public land, must be met as a condition of continuation of the forest management license. Certification to this Standard requires compliance with all applicable federal and provincial regulations. With requirements for ongoing public participation and continual improvement, this standard motivates organizations to go beyond legal compliance.

The Constitution Act, Section 35, provides for the protection of Aboriginal and treaty rights of Aboriginal Peoples in Canada. "Aboriginal Rights" (including title) are not defined in the Constitution Act, but recent court cases (e.g., the *Tsilhqot'in* case) have provided increasing clarity about Aboriginal and treaty rights and title. In addition to government obligations to protect Aboriginal and treaty rights, Aboriginal-owned and -operated businesses have recently been growing in Canada's forest sector. The interest by Aboriginal communities to participate in the forest-sector economy is clear evidence that forest-sector business opportunities are fully compatible with the emerging national framework of Aboriginal and treaty rights and demonstrate the increasingly strengthened relationships between Aboriginal and non-Aboriginal Peoples. Adopting and implementing this Standard, with its new criterion on Aboriginal Relations, is consistent with both levels of engagement with Aboriginal Peoples in Canada.

0.2 High degree of public involvement

CSA Group Standards are developed using an open and inclusive participatory process. The Technical Committee on Sustainable Forest Management consists of a balanced array of representatives from timber producers (including woodlot owners), forest-products manufacturers, academia, provincial and federal governments, and environmental, consumer, union, and Aboriginal groups. In addition to member deliberations, the Committee's work in developing and revising the Standard includes a series

of formal consultations involving any and all interested parties. At each revision of the Standard, the Committee particularly invites input from the public advisory groups convened by forest-management organizations.

The need for public participation is also strongly emphasized within the Standard, which requires organizations to seek comprehensive, continuing public participation at the community level. Under the provisions of the Standard, the public identifies forest values related to environmental, social, and economic concerns and needs. The public also takes part in the forest management planning process and works with organizations to identify and select SFM objectives, indicators, and targets to ensure that these values are addressed. The public participation requirements of this Standard are among the most rigorous in certification standards in the world today. Because Canadian forests are primarily publicly owned, it is vital that a Canadian forest certification standard involve the public extensively in the forest management planning process. Forest management that meets the requirements of this Standard fosters a positive relationship between the organization and the local community.

This Standard was first published in 1996. It was developed using an open and inclusive process managed by CSA Group. One-quarter of the Technical Committee on Sustainable Forest Management membership consisted of timber producers, including woodland owners; the remainder were scientists, academics, representatives of the provincial and federal governments, and environmental, consumer, union, and Aboriginal representatives. In 1995, special consultations with non-governmental and environmental organizations were conducted to obtain input into the development of this Standard. In addition, a Canada-wide public review of this Standard generated considerable interest, with CSA distributing over 1500 copies of the draft standard in response to requests for review. Public meetings were held in Montréal, Toronto, and Vancouver to seek further input.

In 2000, when CSA Group set out to review and improve upon the original Standard, it sought and incorporated public input once again. It also strengthened the conservation representation on the Technical Committee to include representatives from national and provincial wildlife conservation groups.

Work on the fourth edition of this Standard began in 2013. Input from existing public advisory groups (PAGs) active in the implementation of this Standard was sought to improve its effectiveness. Aboriginal representation was incorporated into the membership categories of the Technical Committee. Input received from a broad range of interests during the public review of the draft was incorporated into the 2016 edition.

Like the previous editions, this edition of the Standard was developed in an open, inclusive forum. This Standard reflects the ideas, positions, and concerns of a wide array of individuals and groups from across Canada with an interest in SFM, including the forest industry, woodlot owners, governments, academics, scientists, technical experts, Aboriginal Peoples, unions, consumer groups, and conservation, environmental, and social organizations.

0.3 CCFM SFM criteria and elements as the basis of the SFM performance requirements

The most broadly accepted Canadian forest management values generated to date are embodied in the CCFM SFM criteria and elements. The CCFM SFM criteria and elements are fully consistent with those of the Montréal process and the seven thematic elements of sustainable forest management recognized by the international community at the *United Nations Forum on Forests* in 2004. The requirements of this Standard expand on the CCFM SFM criteria by adding a criterion on Aboriginal relations. In this

Standard, criteria and elements are used as a framework for identifying values and providing vital links between local-level SFM and national and provincial forest policy.

0.4 Performance requirements

This Standard sets a level of performance to be met using a prescribed management system. Performance is dealt with at three levels. First, a set of SFM elements and core indicators is required. Second, the public has the opportunity to assist in setting specific values, objectives, additional indicators, and targets at the local forest level for each of the SFM elements, as well as to participate in effectiveness monitoring. This Standard requires a public participation process to establish and monitor locally appropriate targets (including thresholds and limits). Moreover, this Standard identifies specific requirements for the public participation process. This approach to performance not only respects government-recognized criteria for SFM but also allows the public to participate in the interpretation of the criteria and elements for local application. The third level is the assessment of actual changes in the forest as related to expected future forest conditions and results of management practices.

Thus, this Standard involves a combination of public participation, performance, and management system requirements.

0.5 Conformance with ISO (International Organization for Standardization) Standards

0.5.1 Development of CSA Group standards

CSA Group standards development directives are consistent with those of ISO. CSA Group standards are developed through a consensus process that includes the principles of inclusive participation, respect for diverse interests, and transparency. The process is based on substantial agreement among committee members, rather than a simple majority of votes. When a draft standard has been agreed upon, it is submitted for public review, and amended as necessary. CSA Group standards are living documents that are continually revisited and revised to address changing requirements and emerging technologies. Each standard is reviewed at least every five years as part of a process of continual improvement.

0.5.2 Environmental management systems

This Standard's management system requirements are based on the internationally recognized CAN/CSA-ISO 14001 environmental management system standard. A management system ensures that requirements are fulfilled in a systematic and predictable manner that promotes continual improvement. This Standard includes the continuum of

- a) establishing a policy;
- b) planning;
- c) implementation and operation;
- d) checking and corrective action; and
- e) management review.

0.6 Expected future conditions

A fundamental tenet of adaptive forest management is the need to state explicitly the expected future condition of all the SFM indicators. Those statements express how the indicators are expected to respond to the targets defined in the management plan. Each value is represented by one or more indicators for which targets need to be stated. Targets will often identify an expected or desirable future condition of an indicator. Predictive models may be available for some ecological, economic and social indicators. When such models are not available, the expected future conditions are appropriately

made using informed professional and stakeholder judgement. Public participation is important in the work of creating the statements of expected future conditions for the indicators and assessing how target performance is contributing to the stated future condition.

0.7 Continual improvement

The concept of continual improvement in SFM is central to this Standard. The Standard uses adaptive management procedures that recognize SFM as a dynamic process that incorporates new knowledge acquired through time, experience, and research, and that also evolves with society's changing environmental, social, and economic values. This Standard also requires the organization to undertake an annual review of all its requirements, including performance requirements, to identify areas for continual improvement.

Continual improvement is a necessary aspect not only of forest management but also of the evolution of this Standard. That is why CSA Group requires the Technical Committee review this Standard regularly to ensure that it incorporates knowledge gained through implementation.

0.8 Third-party independent audits

To become certified to this Standard, the organization goes through a third-party independent audit to the SFM requirements in the Standard (these requirements are found in Clauses 4 to 7). The audit is conducted by a certification body accredited by a full International Accreditation Forum (IAF) member accreditation body such as the Standards Council of Canada. The certification body employs, or has access to, a sufficient number of auditors, including audit team leaders, and technical experts to cover all of the audit work performed. Individual auditors employed or contracted by the certification body have the requisite forestry expertise and appropriate knowledge and skills relevant to the geographic areas in which it operates. In addition to the initial certification audit, there are mandatory annual surveillance audits which include both a document review and on-site checks of the forest and management system to ensure that progress is being made towards the achievement of targets and that the SFM requirements are being met. The certification body should implement a risk-based audit sampling approach and, as such, some criteria in this Standard may be assessed more frequently than others. A full recertification audit is required periodically following the initial certification, in accordance with the requirements of ISO/IEC 17021.

0.9 Transparency

This Standard specifies requirements for full public disclosure of

- a) all SFM plans developed under the Standard;
- b) annual reports on progress in implementing SFM plans; and
- c) results of independent certification and surveillance audit reports.

1 Scope

1.1

This Standard specifies requirements for sustainable forest management (SFM) of a defined forest area (DFA), including requirements for

- a) the management framework;
- b) commitment;
- c) public participation;
- d) performance measures and targets;

- e) the systematic review of actions;
- f) the monitoring of effectiveness; and
- g) continual improvement.

Note: While this Standard provides guidance to users regarding certification, requirements for certification and decisions regarding approval rest with the certification bodies.

1.2

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

2 Reference publications

This document refers to the following publications, and where such reference is made, it shall be to the edition listed below.

Note: See also Annex C.

CSA Group

CAN/CSA-ISO 14001-04

Environmental management systems — Requirements with guidance for use

CAN/CSA Z804-08 (R2013)

Sustainable forest management for woodlots and other small area forests

Alberta Forest Genetic Resources Council

Position Paper — Genetically Modified Organisms (GMO), 2001

<http://www.abtreegene.com/policy.html>

CFIA (Canadian Food Inspection Agency)

Action plan for invasive alien terrestrial plants and plant pests: Phase 1 — Key Initiatives, 2006

Government of Canada

Canadian Biodiversity Strategy: Canada’s Response to the Convention on Biological Diversity, 1995.
Ministry of Supply and Services, Ottawa.

http://www.biodivcanada.ca/560ED58E-0A7A-43D8-8754-C7DD12761EFA/CBS_e.pdf

Constitution Act, 1982

Migratory Birds Convention Act, 1994, c. 22

Delgamuukw v. British Columbia, [1997] 3 S.C.R. 1010.

Fisheries Act R.S.1985. c. F-14, s.1

R. v. Badger, [1996] 1 S.C.R. 771.

R. v. Van der Peet, [1996] 2 S.C.R. 507.

ILO (International Labour Organization)

Conventions and Recommendations.

<http://www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang-en/index.htm>

ISO/IEC (International Organization for Standardization/International Electrotechnical Commission)

ISO/IEC 17000-04

Conformity assessment — Vocabulary and general principles

ISO/IEC 17021-1:2015

Conformity assessment — Requirements for bodies providing audit and certification of management systems

IUCN (International Union for Conservation of Nature)

IUCN's Protected Area Programme (1994)

http://www.iucn.org/about/union/commissions/wcpa/wcpa_overview/wcpa_ppa

NRTEE (National Round Table on the Environment and the Economy)

Building Consensus for a Sustainable Future: Putting Principles into Practice, 1996

PEFC (Programme for the Endorsement of Forest Certification Schemes)

ST 2002:2013

Chain of Custody of Forest Based Products - Requirements

CAN-P-16 (2006)

Conformity assessment — Requirements for bodies providing audit and certification management systems

CAN-P-1517C (2006)

Management Systems Accreditation Program (MSAP) Handbook: Conditions and Procedures for the Accreditation of Organizations Certifying/Registering Management Systems

Sustainable Forest Management Network

Beckley, T.M. et al. *Public Participation in Sustainable Forest Management: A Reference Guide to Best Practices*. Edmonton: Sustainable Forest Management Network, 2006.

UNEP (United Nations Environment Program)

Convention on Biological Diversity — Conference of Parties — 2005

United Nations Economic and Social Development

United Nations Forum on Forests. Rep. no. Report on the 4th Session. United Nations, 2004. Web. 2014. <http://www.un.org/esa/forests/forum/previous-sessions/unff-4/index.html>

3 Definitions and abbreviations

3.1 Definitions

The following definitions apply in this Standard:

Aboriginal — First Nations, Inuit, and Métis peoples of Canada.

Aboriginal right — in order to be an Aboriginal right an activity must be an element of a practice, custom, or tradition (or an element thereof) integral to the distinctive culture of an Aboriginal group claiming that right. [*R. v. Van der Peet*, 1996]

Aboriginal title — a right to the land itself, ... a collective right to the land held by all members of an Aboriginal nation. ...encompasses the right to use the land pursuant to that title for a variety of purposes, which need not be aspects of those Aboriginal practices, cultures and traditions which are integral to the distinctive Aboriginal cultures. [*Delgamuukw v. British Columbia*, 1997]

Aboriginal treaty rights — "...those contained in official agreements between the Crown and the native peoples". [*R. v. Badger* 1996]

Accreditation body — the authoritative body that performs accreditation.

Note: *The authority of an accreditation body is generally derived from government [ISO/IEC 17000]*

Adaptive management — a learning approach to management that recognizes substantial uncertainties in managing forests, develops explicit statements of system response to management actions, and formally incorporates into decisions the knowledge gained from monitoring the implementation and consequences of previous actions.

Afforestation — the conversion of land that has not been forested for a period of at least 50 years to forest through planting, seeding or natural regeneration.

Analysis unit — an area that may be larger or smaller than the DFA, and forms the basis of forecasts and targets.

Note: *Recognizes that the analysis appropriate for the indicator might be at a different scale than the DFA. Allows best use of existing data and analysis.*

Appeal — a request by an organization that is certified or seeking certification to a certification body or an accreditation body for reconsideration by that body of a certification decision that has been made.

Auditor — a person qualified to perform audits.

Note: *For SFM certification audits, auditors are qualified in accordance with the requirements specified in SCC CAN-P-16, SCC CAN-P-1517C, and SFMP Handbook to CAN/CSA-Z809.*

Biodiversity (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 part; this includes diversity within species, between species and of ecosystems. [*Canadian Biodiversity Strategy*, 1995]

Biomass — in ecology, the total mass of organisms in a given area. In forest management, tree biomass includes the living portions of trees as well as deadwood in living trees, standing dead trees, and unrotted deadwood on the forest floor.

Note: *In the context of sustainable forest management, biomass usually refers to plant matter.*

CAN/CSA-ISO 14001 — an internationally recognized environmental management system standard by the International Organization for Standardization.

Note: *CAN/CSA-ISO 14001 has been approved as a National Standard of Canada by the Standards Council of Canada.*

Certification — the result of a successful certification process in conformance with this Standard, whereby the certification body issues a certification certificate and adds the organization's certification to a publicly available list maintained by the certification body.

Note: *Certification of a management system is sometimes also called registration.*

Certification applicant — an organization that has applied to an accredited certification body for certification to this Standard.

Certification audit — a systematic and documented verification process used to obtain and evaluate evidence objectively in order to determine whether an organization meets the SFM requirements of this Standard.

Certification body — an independent third party that is accredited as being competent to certify organizations with respect to nationally and internationally recognized standards.

Certification certificate — the official document issued by a certification body to an organization upon successful completion of the certification process (including the certification audit).

Note: *Where more than one organization is included in the certification process, the names of all organizations will be listed on the certificate.*

Complaint — an expression of dissatisfaction, other than an appeal, by any person or organization to a certification body or an accreditation body related to the activities of that body, where a response is expected.

Note: *In Canada, the accreditation body for certification bodies conducting audits to this Standard is the Standards Council of Canada.*

Compliance — conformity with legal obligations and other adopted obligations.

Component — an individual element of the SFM system.

Note: *Components include policy, planning, implementation and operation, checking and corrective action, and management review.*

Conformance — fulfillment of a requirement of this Standard.

Note: *Non-legal requirements include policies, work instructions, or standards (including this Standard).*

Continual improvement — the ongoing process of enhancing SFM performance using

- a) experience;
- b) assessment of results;
- c) the incorporation of new knowledge in line with the organization's SFM policy; and
- d) the application of SFM requirements.

Corrective action — action to eliminate the cause of a detected nonconformity or other undesirable situation.

Defined forest area (DFA) — a specified area of forest, including land and water (regardless of ownership or tenure), to which the requirements of this Standard apply.

Note: A DFA can consist of one or more blocks or parcels. For volume based tenures a statement of applicability within a forest management unit can be made.

Deforestation — the conversion of forest to another land use. It does not include temporary tree-cover loss such as tree harvests followed by regeneration, or temporary loss resulting from natural disturbances such as wildfires, insect epidemics, or wind storms.

Note: See http://www.fao.org/docrep/009/j9345e/j9345e07.htm#P224_17608.

DFA-related worker — an individual employed by an organization to work for wages or a salary, who does not have a significant or substantial share of the ownership in the employer's organization and does not function as a manager of the organization.

Ecosystem — plants, animals, and micro-organisms and their non-living environment, interacting as a functioning unit.

Note: Ecosystem "can describe small-scale units, such as a drop of water, as well as large-scale units, such as the biosphere". [Canadian Biodiversity Strategy, 1995]

Element — the subcategory used to define the scope of each SFM criterion.

Note: Each SFM criterion contains several elements. The SFM elements were derived from the national-scale elements developed by the CCFM for more specific local applications.

Environment — the surroundings in which an organization operates.

Note: The environment encompasses air, water, land, natural resources, flora, fauna, humans, and the interrelations of these elements.

Fish habitat — spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly to carry out their life processes. [Fisheries Act, 1985]

Focal species — species that warrant special conservation attention.

Note: Criteria for the selection of focal species can include ecological, socio-cultural, scientific, and economic considerations.

Forecast — an explicit statement of the expected future condition of an indicator.

Forest — an ecosystem dominated by trees and other woody vegetation growing more or less closely together, its related flora and fauna, and the values attributed to it.

Forest condition — the state of the forest ecosystem as determined by a range of variables associated with forest structure, composition, and processes.

Forest land — land supporting a forest or capable of doing so.

Forest plantations — tree stands established by planting or seeding often with one or few species, intensively managed exclusively for wood production, and which lack most of the key characteristics of natural forests.

Group entity — an entity identified to represents the participants of a group organization. One or more group participants can be selected as the group entity.

Group organization — a group of participants represented by the group entity for the purpose of adoption and implementation of this Standard.

Group participant — a forest manager and/or owner and member of the group organization who has the legal right to manage a defined forest area and the ability to implement the requirements of this Standard.

Indicator — a variable that measures or describes the state or condition of a value.

Interested party — an individual or organization interested in and affected by the management activities of a DFA.

Invasive alien species — plants, animals, or micro-organisms that have been introduced by human action outside their natural past or present distribution, and whose introduction or spread threatens the environment, the economy, or society, including human health. [CFIA, 2006]

Long term — in the context of making forecasts regarding forest structure and composition, at minimum, twice the average life expectancy of the predominant trees in a DFA, up to a maximum of 300 years.

Migratory bird — the sperm, eggs, embryos, tissue cultures, and other parts of a migratory bird as defined in the *Migratory Birds Convention Act, 1994*.

Native species — a species that occurs naturally in an area; a species that is not introduced.

Objective — a broad statement describing a desired future state or condition of a value.

Old-growth forest — a forest dominated by old trees.

Note: *The age and structure of old-growth forests vary significantly by forest type and from one eco-region to another.*

Organization — a company, corporation, firm, enterprise, government, authority, or combination thereof, incorporated or not, public or private, that has its own functions and administration and that, for the purposes of this Standard, applies for certification.

Note: *For organizations with more than one operating unit (e.g., a division), a single operating unit may be defined as an organization.*

Personnel — management, contractors, and DFA-related workers employed by an organization.

Productivity — the ability of a forest ecosystem to capture energy, support life forms, and produce goods and services.

Protected area — an area of land and/or sea specifically dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, and managed through legal or other effective means. [IUCN, 1994]

Reforestation — re-establishment of trees on forest land following natural (e.g., fire) or human (e.g., timber harvest) disturbance.

Seral stage — an identifiable stage of vegetative community development.

SFM performance — the assessable results of SFM as measured by the level of achievement of the targets set for a DFA.

SFM policy — an organization's statement of intentions and principles in relation to SFM that provides a framework for objectives, targets, practices, and actions.

SFM requirements — the public participation, performance, and system requirements of this Standard.

SFM system — the structure, responsibilities, practices, procedures, processes, and time frames specified by a certification body for implementing, maintaining, and improving SFM.

Species at risk — species defined as at risk by national and provincial legislation applicable to a given DFA.

Standard — a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or specifications for activities or their results, aimed at the achievement of the optimum degree of consistency in a given context.

Note: *Standards are based on the consolidated findings of science, technology, and experience and are aimed at the promotion of optimum community benefits.*

Strategy — a coordinated set of actions designed to meet established targets.

Sustainable forest management (SFM) — management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things while providing environmental, economic, social and cultural opportunities for present and future generations.

Sustainable harvest level — the harvest level of forest products that, with consideration for ecological, economic, social, and cultural factors, leads to no significant reduction of the forest ecosystem's capacity to support the same harvest level in perpetuity.

Target — a specific statement describing a desired future state or condition of an indicator.

Note: *Targets should be clearly defined, time-limited, and quantified, if possible.*

Tenure — the terms under which a forest manager or owner possesses the rights, and assumes the responsibilities, to use, harvest, or manage one or more forest resources in a specified forest area for a specified period of time.

Note: *Private ownership of forest land is the strongest form of tenure, as the rights and obligations rest solely with the forest owner. Forest tenures of public land in Canada fall into two main categories: area-based and volume-based. Area-based tenures not only confer timber-harvest rights but also usually oblige the tenure holder to assume forest management responsibilities. Volume-based tenures normally give the holder the right to harvest specific volumes of timber in areas specified by the landowner or manager, but can also oblige holders to assume forest management responsibilities.*

Top management — persons with decision-making authority regarding SFM policy, resource allocation, and planning in the DFA.

Value — a DFA characteristic, component, or quality considered by an interested party to be important in relation to an SFM element or other locally identified element.

Watershed — an area that drains all precipitation received as a runoff or base flow (groundwater sources) into a particular river or set of rivers.

Wetlands — areas that are seasonally or permanently waterlogged and characterized by vegetation adapted for life in saturated/flooded conditions. Wetlands can be treed, shrubby or open and include bogs, fens, swamps, marshes and shallow open water areas. Some wetlands are stagnant systems (e.g., bogs), slow flowing (e.g., fens, swamps), or have fluctuating water levels (e.g., marshes, shallow open water).

Woodlot — small area of wooded land, often privately owned.

3.2 Abbreviations

The following abbreviations apply in this Standard:

- BMP — best management practices
- CoC — chain of custody
- DFA — defined forest area
- NPP — net primary production
- PAG — public advisory group
- SFM — sustainable forest management

4 Sustainable forest management requirements

4.1 General requirements

The organization shall meet the

- a) public participation requirements specified in Clause 5;
- b) performance requirements specified in Clause 6; and
- c) system requirements specified in Clause 7.

Note: See Clause A.4.1 for a commentary on this Clause.

4.2 Required activities

The organization shall meet the sustainable forest management (SFM) requirements of this Standard, which include

- a) compliance with legislation applicable to the defined forest area (DFA);
- b) values, objectives, indicators, and targets that clearly address the SFM criteria and elements in this Standard;
- c) ongoing and meaningful public participation;
- d) implementation of adaptive management;
- e) progress towards or achievement of performance targets; and
- f) continual improvement in performance.

Note: See Clause A.4.2 for a commentary on this Clause.

5 Public and Aboriginal participation requirements

5.1 General requirements

The organization shall establish and implement a public participation process by

- a) starting a new process;
- b) building on an existing process; or
- c) reviving a previous process.

Note: See Clause A.5.1 for a commentary on this Clause.

5.2 Interested parties

The organization shall

- a) openly seek representation from a range of interested parties, including DFA-related workers, and invite them to participate in the public participation process;

- b) demonstrate through documentation that efforts were made to contact and encourage affected and interested communities, including Aboriginal communities, to become involved in the SFM public participation process;
- c) provide interested parties with relevant background information;
- d) acknowledge that Aboriginal participation is without prejudice to Aboriginal title and rights, or treaty rights; and
- e) demonstrate that the public participation process is open, inclusive and responsive.

Note: See Clause [A.5.2](#) for a commentary on this Clause.

5.3 Process: Basic operating rules for advisory groups

The organization shall demonstrate that

- a) the public participation process for advisory groups works according to clearly defined operating rules that contain provisions on
 - i) content;
 - ii) goals;
 - iii) timelines;
 - iv) internal and external communication;
 - v) resources (including human, physical, financial, information, and technological, as necessary and reasonable);
 - vi) roles, responsibilities, and obligations of participants and their organizations;
 - vii) conflict of interest;
 - viii) decision-making methods;
 - ix) authority for decisions;
 - x) mechanisms to adjust the process as needed;
 - xi) access to information (including this Standard);
 - xii) participation of industry, government, Aboriginal communities, appropriate experts, and other interested parties or individuals;
 - xiii) involvement of experts (i.e., ecologists, biologists, hydrologists, etc.), if required when appropriate to the topic of discussion;
 - xiv) dispute-resolution mechanism; and
 - xv) mechanism to measure participant satisfaction with the process; and
- b) the participants have agreed to the public participation process operating rules.

Note: See Clause [A.5.3](#) for a commentary on this Clause.

5.4 Work of the advisory group

In the public participation process, the advisory group shall have opportunities to work with the organization to

- a) identify and select values, objectives, indicators, and targets based on SFM elements and any other issues of relevance to the DFA;
- b) develop, assess and select one or more possible strategies for achieving targets;
- c) review the SFM plan;
- d) evaluate results of monitoring programs, and discuss improvements; and
- e) discuss any issues relevant to SFM in the DFA.

The organization and the public participation process shall ensure that the values, objectives, indicators, and targets are consistent with relevant government legislation, regulations, and policies.

Note: See Clause [A.5.4](#) for a commentary on this Clause.

5.5 Public communication

The organization shall

- a) provide access to information about the DFA and the SFM requirements including the public participation process;
- b) provide access to information about the progress being made in the implementation of the SFM plan;
- c) make the SFM plan publicly available;
- d) make publicly available annual reporting on its performance in meeting and maintaining the SFM requirements;
- e) demonstrate that all input is considered and responses are provided;
- f) demonstrate that there is ongoing public communication; and
- g) make publicly available the results of independent certification and surveillance audit reports, including, at minimum, the following information:
 - i) a description of the audit process, objectives, and scope;
 - ii) the scope of certification;
 - iii) DFA and tenure description;
 - iv) an overview of elements audited both off-site and on-site,;
 - v) the name of the certified organization and/or co-applicant(s) that were audited;
 - vi) the name of the certification body;
 - vii) the names and professional qualifications of the lead auditor and audit team members;
 - viii) the certification dates, including the date that the certificate was issued and the date it expires;
 - ix) the number of auditor days spent to conduct the audit, broken down by time spent off and on-site;
 - x) the size of the audit field sample (i.e., the number of roads, harvesting and silviculture sites inspected);
 - xi) the number of people interviewed;
 - xii) for multi-site certifications where only a sample of sites were visited, a discussion on how many sites are included in the certification and the sample that was visited during the current audit;
 - xiii) an overview of the audit findings, such as general descriptions of nonconformities, opportunities for improvement, and best practices;
 - xiv) discussion of any significant concerns relevant to the Standard, made during the audit by public participation members, Aboriginal communities, government officials, DFA workers or other interested parties and the conclusions reached by the audit team in relation to them;
 - xv) a statement summarizing the management response to the nonconformities;
 - xvi) an update on previous nonconformities;
 - xvii) the certification recommendation; and
 - xviii) key focus areas/topics to be assessed during the next audit.

Note: See [Clause A.5.5](#) for a commentary on this Clause.

6 SFM performance requirements

6.1 DFA-specific performance requirements

The organization, working with interested parties in the public participation process at each stage, shall

establish DFA-specific performance requirements that address the SFM elements in Clause 6.3, as follows:

- a) for each element, one or more DFA-specific values shall be identified;
- b) for each value, one or more objectives shall be set;
- c) for each value, one or more meaningful indicators shall be identified, including core and locally selected indicators. Indicators shall be quantitative where feasible;
- d) for each indicator, data on the current status shall be provided, and one or more appropriate targets shall be set. Each target shall specify acceptable levels of variance for the indicator and clear time frames for achievement. A clear justification shall be provided for why the targets have been chosen, and how they support the applicable value and objectives;
- e) one or more strategies shall be described for achieving identified targets; and
- f) the expected response of each indicator in relation to the target shall be described. Where analytical forecasts were used, the methods, assumptions, and limitations used for making the forecast shall also be described.

The work shall be recorded and summarized in the SFM plan. During plan implementation, measurements shall be taken for each indicator at appropriate times and places. Measurement results shall be interpreted in the context of the expected response. See Figure A.4 for an illustration of the relationship of values, objectives, indicators, and targets. See Clauses 7.5.1 and 7.6 for information on adaptive management.

Note: See Clause A.6.1 for a commentary on this Clause.

6.2 SFM criteria — General

The organization, in conformance with the public participation process requirements of Clause 5, shall address the discussion items listed under each Criterion below, and shall identify DFA-specific values, objectives, indicators, and targets for each element, as well as any other values associated with the DFA. The organization may identify analysis units applicable to the DFA used to determine objectives, indicators, and targets for each element. Analysis units may be larger or smaller than the DFA.

The indicators shall include, but not necessarily be limited to, the core indicators identified in this Standard.

Note: See Clause A.6.2 for a commentary on this Clause.

6.3 SFM criteria, elements, and core indicators

6.3.1 Criterion 1 — Biological diversity

Note: See Clause A.6.3.1 for a commentary on this Clause.

6.3.1.1 General

Conserve biological diversity by maintaining integrity, function, and diversity of living organisms and the complexes of which they are part, including ecological elements that contribute to cultural values.

6.3.1.2 Discussion items for Criterion 1

The public participation process shall include discussion of the following topics:

- forest habitat connectivity and conservation at the landscape level;
- management in the context of natural disturbance regimes and patterns and the range of natural variation;
- maintenance of populations and communities over time;
- local and regional protected areas and integrated landscape management;

- silvicultural regimes and practices such as integrated pest management and pesticide use, structural retention, and timber harvest practices (including clear-cutting);
- practices to limit the spread of invasive alien species, and the regulatory prohibitions related to adverse ecological effects and the use of exotic tree species;
- management and protection of biological resources of cultural heritage significance;
- management of cultural values and resources;
- locally available processes and methods for identifying sites with special biological and cultural significance;
- conservation of old-growth forest attributes;
- participation in government programs to protect threatened and endangered species; and
- role and importance of wetlands.

6.3.1.3 Element 1.1 — Ecosystem diversity

Conserve ecosystem diversity at the stand and landscape levels by maintaining the variety of communities and ecosystems that naturally occur in the DFA. Establish forest plantations only in afforestation projects.

Core indicators

- 1.1.1 — Ecosystem area by type.
- 1.1.2 — Forest area by type or species composition.
- 1.1.3 — Forest area by seral stage or age class.
- 1.1.4 — Degree of within-stand structural retention.

Note: See Clause [A.6.3.1.3](#) for a commentary on this Clause.

6.3.1.4 Element 1.2 — Species diversity

Conserve species diversity by ensuring that habitats and forest conditions for the native species found in the DFA are maintained through time, including habitats for known occurrences of species at risk.

Core indicators

- 1.2.1 — Degree of habitat protection for selected focal species, including species at risk.
- 1.2.2 — Degree of suitable habitat in the long term for selected focal species, including species at risk.
- 1.2.3 — Proportion of regeneration comprised of native species.

Note: See Clause [A.6.3.1.4](#) for a commentary on this Clause.

6.3.1.5 Element 1.3 — Genetic diversity

Conserve genetic diversity by maintaining the variation of genes within species and ensuring that reforestation programs are free of genetically engineered trees.

Note: See Clause [A.6.3.1.5](#) for a commentary on this Clause.

6.3.1.6 Element 1.4 — Protected areas and sites of special biological, geological, heritage, or cultural significance

Respect protected areas identified through government processes. Co-operate in broader landscape management related to protected areas and sites of special biological or cultural significance.

Identify sites of special biological, geological, heritage, or cultural significance within the DFA, and implement management strategies appropriate to their long-term maintenance.

Core indicators

1.4.1 — Protection of sites of special significance.

1.4.2 — Proportion of identified sites with implemented management strategies.

Note: See Clause A.6.3.1.6 for a commentary on this Clause.

6.3.2 Criterion 2 — Ecosystem condition and productivity

Note: See Clause A.6.3.2 for a commentary on this Clause.

6.3.2.1 General

Conserve forest ecosystem condition and productivity by maintaining the health, vitality, and rates of biological production.

6.3.2.2 Discussion items for Criterion 2

The public participation process shall include discussion of the following topics:

- climate change impacts and adaptations;
- trends in natural and human-caused disturbances;
- proportion of naturally disturbed area that is not salvage harvested; and
- biomass utilization.

6.3.2.3 Element 2.1 — Forest ecosystem condition and productivity

Conserve forest ecosystem productivity and productive capacity by maintaining ecosystem conditions that are capable of supporting naturally occurring species. Reforest promptly and use tree species ecologically suited to the site.

Core indicators

2.1.1 — Reforestation success.

2.1.2 — Proportion of regeneration comprised of native species.

2.1.3 — Additions and deletions to the forest area.

2.1.4 — Proportion of the calculated long-term sustainable harvest level that is actually harvested.

Note: See Clause A.6.3.2.3 for a commentary on this Clause.

6.3.3 Criterion 3 — Soil and water

Note: See Clause A.6.3.3 for a commentary on this Clause.

6.3.3.1 General

Conserve soil and water resources by maintaining their quantity and quality in forest ecosystems.

6.3.3.2 Discussion items for Criterion 3

The public participation process shall include, but not be limited to, discussion of the following topics:

- soil productivity;
- sensitive sites;
- soil disturbance prevention and mitigation measures;

- site rehabilitation in areas of severe soil disturbance;
- water quality and quantity in watersheds supplying domestic water;
- management practices and regulatory requirements that conserve water and soil; and
- role and importance of wetlands.

6.3.3.3 Element 3.1 — Soil quality and quantity

Conserve soil resources by maintaining soil quality and quantity.

Core indicators

3.1.1 — Level of soil disturbance.

3.1.2 — Level of downed woody material.

Note: See Clause A.6.3.3.3 for a commentary on this Clause.

6.3.3.4 Element 3.2 — Water quality and quantity

Conserve water resources by maintaining water quality and quantity.

Core indicators

3.2.1 — Proportion of watershed or water management areas with recent stand-replacing disturbance.

3.2.2 — Proportion of forest management activities, consistent with prescriptions to protect identified water features.

Note: See Clause A.6.3.3.4 for a commentary on this Clause.

6.3.4 Criterion 4 — Role in global ecological cycles

Note: See Clause A.6.3.4 for a commentary on this Clause.

6.3.4.1 General

Maintain forest conditions and management activities that contribute to the health of global ecological cycles.

6.3.4.2 Discussion items for Criterion 4

The public participation process shall include, but not be limited to, discussion of the following topic:

- carbon emissions from fossil fuels used in forest operations; and
- role of forest ecosystems and their management in the global carbon cycle.

6.3.4.3 Element 4.1 — Carbon uptake and storage

Maintain the processes that take carbon from the atmosphere and store it in forest ecosystems.

Core indicators

4.1.1 — Net carbon uptake.

4.1.2 — Reforestation success.

Note: See Clause A.6.3.4.3 for a commentary on this Clause.

6.3.4.4 Element 4.2 — Forest land conversion

Protect forest lands from deforestation. Encourage afforestation where ecologically appropriate.

Core indicators

4.2.1 — Additions and deletions to the forest area.

6.3.5 Criterion 5 — Economic and social benefits

Note: See Clause A.6.3.5 for a commentary on this Clause.

6.3.5.1 General

Sustain flows of forest benefits for current and future generations by providing multiple goods and services.

6.3.5.2 Discussion items for Criterion 5

The public participation process shall include, but not be limited to, discussion of the following topics:

- benefits for local communities and Aboriginal Peoples (cultural, spiritual, economic, health, etc.);
- fair distribution of benefits and costs;
- proportion of goods and services sourced from local communities (to the extent that they are available and reasonably cost-competitive); and
- the significant vulnerabilities for community sustainability linked to forest and timber supply conditions over time.

6.3.5.3 Element 5.1 — Timber and non-timber benefits

Manage the forest sustainably to produce a mix of timber and non-timber benefits. Support a diversity of timber and non-timber forest products and forest-based services.

Core indicators

5.1.1 — Documentation of the diversity of timber and non-timber resources, including products and services produced in the DFA.

5.1.2 — Evidence of open and respectful communications with forest dependent businesses, forest users and local communities to integrate non-timber resources into forest management planning. When significant disagreement occurs, efforts towards conflict resolution are documented.

Note: See Clause A.6.3.5.3 for a commentary on this Clause.

6.3.5.4 Element 5.2 — Communities and sustainability

Contribute to the sustainability of communities by providing diverse opportunities to derive benefits from forests and by supporting local community economies.

Core indicators

5.2.1 — Level of participation and support in initiatives that contribute to community sustainability.

5.2.2 — Level of participation and support in training and skills development.

5.2.3 — Level of direct and indirect employment.

Note: See Clause A.6.3.5.4.

6.3.6 Criterion 6 — Society's responsibility

6.3.6.1 General

Sustainable forest management includes society's responsibility for worker and community safety, and the requirement for fair, equitable, and effective forest management decisions.

6.3.6.2 Element 6.1 — Fair and effective decision-making

Demonstrate that the SFM public participation process is designed and functioning to the satisfaction of the participants and that there is general public awareness of the process and its progress.

Core indicators

6.1.1 — Level of participant satisfaction with the public participation process.

6.1.2 — Evidence of efforts to promote capacity development and meaningful participation in general.

6.1.3 — Availability of summary information on issues of concern to the public.

Note: See Clause A.6.3.6.2 for a commentary on this Clause.

6.3.6.3 Element 6.2 — Safety

Demonstrate that the organization is providing and promoting safe working conditions for its employees and contractors.

Core indicators

6.2.1 — Evidence of co-operation with DFA-related workers to improve and enhance safety standards, procedures, and outcomes in all DFA-related workplaces and affected communities.

6.2.2 — Evidence that a worker safety program has been implemented and is periodically reviewed and improved.

Note: See Clause A.6.3.6.3 for a commentary on this Clause.

6.3.7 Criterion 7 — Aboriginal relations

6.3.7.1 General

Recognize and respect the unique rights and values of Aboriginal Peoples.

6.3.7.2 Element 7.1 — Aboriginal and treaty rights

Recognize and respect Aboriginal title and rights, and treaty rights. Understand and comply with current legal requirements related to Aboriginal title and rights, and treaty rights.

Core indicators

7.1.1 — Evidence of a good understanding of the nature of Aboriginal title and rights.

7.1.2 — Evidence of ongoing open and respectful communications with Aboriginal communities to foster meaningful engagement, and consideration of the information gained about their Aboriginal title and rights through this process. Where there is communicated disagreement regarding the organization's forest management activities, this evidence would include documentation of efforts towards conflict resolution.

Note: See Clause A.6.3.7.2 for a commentary on this Clause.

6.3.7.3 Element 7.2 — Respect for Aboriginal forest values, knowledge, and uses

Respect traditional Aboriginal forest values, knowledge, and uses as identified through an Aboriginal input process.

Core indicators

7.2.1 — Evidence of efforts to promote capacity development and meaningful participation for Aboriginal individuals, communities and forest-based companies.

7.2.2 — Evidence of understanding and use of Aboriginal knowledge through the engagement of willing Aboriginal communities, using a process that identifies and manages culturally important resources and values.

7.2.3 — Level of management and/or protection of areas where culturally important practices and activities occur.

Note: See Clause A.6.3.7.3 for a commentary on this Clause.

7 SFM system requirements

7.1 General

The organization shall establish and maintain an SFM system as specified in Clause 7.

Note: See Clause A.7.1 for a commentary on this Clause.

7.2 SFM policy

Top management shall define and maintain the organization's SFM commitment through policy statements and/or other documented public statements. The statement(s) shall contain a commitment to

- a) achieve and maintain SFM;
- b) meet or exceed all relevant legislation, regulations, policies, and other requirements to which the organization subscribes;
- c) provide for public participation;
- d) respect and recognize Aboriginal title and rights, and treaty rights;
- e) provide participation opportunities for Aboriginal Peoples with rights to and interests in SFM within the DFA;
- f) provide conditions and safeguards for the health and safety of DFA-related workers and the public;
- g) honour all international agreements and conventions relevant to SFM to which Canada is a signatory;
- h) improve knowledge about the forest and SFM, monitor advances in SFM science and technology, and incorporate these advances where applicable; and
- i) demonstrate continual improvement of SFM.

The statement(s) shall be documented, communicated, and made publically available.

Note: See Clause A.7.2 for a commentary on this Clause.

7.3 Planning

7.3.1 Defined forest area

The organization shall clearly designate a DFA to which this Standard applies.

The organization shall define the geographic extent and the respective ownership and management responsibilities for the DFA and utilize applicable inventories and maps to support the SFM plan.

Note: See Clause A.7.3.1 for a commentary on this Clause.

7.3.2 Defined responsibilities

The organization shall identify the parties present in the DFA, and clearly describe their respective roles and responsibilities.

Where there are parties operating within the DFA that are not interested in participating or are not necessary for the achievement of the SFM elements, the organization may proceed without their involvement provided that the overall objectives and targets can still be achieved.

Note: See Clause A.7.3.2 for a commentary on this Clause.

7.3.3 Rights and regulations

The organization shall

- a) respect the legal rights and responsibilities of other parties in the DFA;
- b) demonstrate that relevant legislation and regulatory requirements relating to ownership, tenure, rights, and responsibilities in the DFA have been identified and complied with;
- c) demonstrate that the legal and constitutional rights relevant to SFM (including those specified in the International Labour Organization [ILO] *Conventions and Recommendations* to which Canada is a signatory [such as “Freedom of Association” and “Protection of the Right to Organize”]) and the health and safety of DFA-related workers are respected, and their contributions to SFM are encouraged;
- d) demonstrate that the acquired and legal rights of private woodlot owners to set the values, objectives, indicators, and targets relating to their properties are respected; and
- e) establish and maintain procedures to identify and have access to all legal and other requirements to which the organization subscribes that are applicable to the DFA. This includes requirements related to ownership tenure, rights, and responsibilities in the DFA.

Note: See Clause A.7.3.3 for a commentary on this Clause.

7.3.4 Incorporation of public participation requirements

The public participation requirements specified in Clause 5 shall be incorporated into the SFM system.

Note: See Clause A.7.3.4 for a commentary on this Clause.

7.3.5 SFM plan

The organization shall document, maintain, and make publicly available an SFM plan for the DFA. The SFM plan for each DFA shall include

- a) a comprehensive description and map of the DFA including analysis units (if applicable);
- b) a summary of the most recent forest management plan and the management outcomes;
- c) a set of values, objectives, indicators, and targets;
- d) the current status and forecasts for each indicator, including a description of the assumptions and analytical methods used for forecasting where relied upon;
- e) a description of the chosen strategy for each target, including all significant actions to be undertaken and the associated implementation schedule;
- f) a description of the monitoring program; and
- g) an analysis of actual and expected outcomes.

Note: See Clause A.7.3.5 for a commentary on this Clause.

7.4 Implementation and operation

Note: See Clause A.7.4 for a commentary on this Clause.

7.4.1 Structure, responsibility, and resources

Roles, responsibilities, and authority required to implement and maintain conformance with SFM requirements shall be defined, documented, and communicated within the organization.

The organization shall provide resources essential to the implementation and control of the SFM requirements, including human resources and specialized skills, technology, and financial resources.

Note: See Clause A.7.4.1 for a commentary on this Clause.

7.4.2 Competence, training, and knowledge

The organization shall identify training needs. It shall also ensure that personnel receive training in accordance with the impact of their work on the DFA and their ability to ensure that SFM requirements are met.

The organization shall establish and maintain procedures to ensure that personnel, at each relevant function and level, have knowledge of their roles and responsibilities in achieving conformance with the SFM policy and SFM requirements. The organization shall ensure that its personnel are qualified on the basis of appropriate training and/or work experience and have opportunities to gain new knowledge. The organization shall also require contractors working on its behalf to demonstrate that their personnel have the requisite training and awareness levels. The organization shall continually improve its knowledge of the DFA and SFM and shall monitor advances in SFM science and technology, and incorporate them where and when applicable.

Note: See Clause A.7.4.2 for a commentary on this Clause.

7.4.3 Communication

The organization shall

- a) establish and maintain procedures for internal communication between its various levels and functions; and
- b) establish and maintain procedures for receiving, documenting, and responding to relevant communication from external interested parties.

Note: See Clause A.7.4.3 for a commentary on this Clause.

7.4.4 SFM documentation

The organization shall establish and maintain documentation, in paper or electronic form, that

- a) describes the SFM requirements and their interaction; and
- b) provides direction to related documentation.

Organizations shall ensure that DFA-related workers and contractors have access to the documentation relevant to their responsibilities and tasks.

Note: See Clause A.7.4.4 for a commentary on this Clause.

7.4.5 Document control

The organization shall establish and maintain procedures for controlling all documents (paper or electronic) required by this Standard.

Procedures and responsibilities for the creation and modification of the various types of documents shall be established and maintained.

Note: See Clause A.7.4.5 for a commentary on this Clause.

7.4.6 Operational procedures and control

The organization shall

- a) identify, establish, and maintain the operational procedures and controls needed to meet the SFM requirements; and
- b) communicate relevant procedures, controls, and requirements to employees, suppliers, and contractors working on behalf of the organization.

Note: See Clause A.7.4.6 for a commentary on this Clause.

7.4.7 Emergency preparedness and response

The organization shall establish and implement procedures for preventing and responding to environmental emergencies and accidents.

Note: See Clause A.7.4.7 for a commentary on this Clause.

7.5 Checking and corrective action

7.5.1 Monitoring and measurement

The organization shall

- a) establish and maintain procedures to monitor on a regular basis progress towards conformance with the SFM requirements in the DFA;
- b) record performance levels and monitor indicators for comparison against targets/forecasts; and
- c) periodically assess the quality and meaningfulness of the targets, forecasts and non-core indicators where applicable.

Note: See Clause A.7.5.1 for a commentary on this Clause.

7.5.2 Corrective action

The organization shall establish and maintain procedures for

- a) defining responsibility and authority for identifying and investigating nonconformity;
- b) taking action to mitigate impacts; and
- c) initiating and completing corrective action.

Any corrective action taken to eliminate the causes of actual and potential nonconformities shall be appropriate to the magnitude of problem and commensurate with the impact encountered.

Note: See Clause A.7.5.2 for a commentary on this Clause.

7.5.3 Records

The organization shall establish and maintain procedures for the identification, maintenance, and disposal of SFM requirement records. These records shall include training records and the results of audits and reviews.

Note: See Clause A.7.5.3 for a commentary on this Clause.

7.6 Management review

The organization's top management shall periodically review the SFM requirements to ensure that progress towards SFM continues to be suitable, adequate, and effective. The information necessary to allow top management to carry out this evaluation shall be collected. This review shall be documented.

In order to be adaptive, the management review shall address the possible need for changes to policy, targets, and other SFM requirements, in light of audit results, changing circumstances, and the commitment to continual improvement.

Note: See Clause [A.7.6](#) for a commentary on this Clause.

7.7 Group certification requirements

7.7.1 Basic requirements

Where a group organization adopts and implements this Standard, the group organization shall

- a) identify all participants of the group organization; and
- b) identify a group entity to represent the group organization.

Note: See Clause [A.7.7.1](#) for a commentary on this Clause.

7.7.2 Group entity responsibilities

The group entity shall

- a) represent the group organization in the certification process, including
 - i) communication with the certification body;
 - ii) submission of an application for certification; and
 - iii) maintenance of a contractual arrangement with the certification body;
- b) provide a commitment on behalf of the group organization to meet the requirements of this Standard;
- c) establish documented procedures for management of the group organization as specified in Clause [7.4.1](#);
- d) keep records of
 - i) contact information for all participants of the group organization;
 - ii) the DFA;
 - iii) the results of audits of the group organization; and
 - iv) the results of monitoring programs;
- e) establish a written agreement with all group participants which includes confirmation of participation in the group organization, a commitment to meet the requirements of this Standard, and measures to exclude any group participant from the scope of certification in the event of nonconformities with this Standard where corrective actions have not been taken;
- f) provide group participants with information and guidance as specified in Clauses [7.4.2](#) and [7.4.4](#);
- g) monitor annually the conformance of the group participants with the requirements of this Standard;
- h) review conformity with this Standard including the results of the monitoring program and certification body audit results, and the effectiveness of corrective actions; and
- i) ensure the group participants are provided with a document confirming the scope of the group certification to this Standard.

Note: See Clause [A.7.7.2](#) for a commentary on this Clause.

7.7.3 Group participant responsibilities

Each group participant shall

- a) provide the group entity with a written agreement as specified in Clause [7.7.2](#) e);
- b) provide a commitment to meet the requirements of this Standard;
- c) respond effectively to requests from the group entity for access to information and access to the DFA in relation to audits and reviews of conformity with this Standard; and

d) implement corrective actions established by the group entity.

Note: See Clause [A.7.7.3](#) for a commentary on this Clause.

Annex A (informative)

Guidance for implementation and certification

Notes:

- 1) *This Annex is not a mandatory part of this Standard.*
- 2) *The clause numbering scheme in this Annex has been devised to facilitate reference to related clauses in the main body of this Standard.*

A.4 Sustainable forest management requirements

A.4.1 General requirements

Note: *This commentary is related to Clause 4.1.*

SFM requirements are presented in three separate clauses to facilitate comprehension of the main tenets of this Standard. However, these three sets of requirements are interrelated and should be considered together, rather than independently. For example, the performance requirements provide much of the content for the public participation process. Similarly, an important function of the system requirements is to provide the organization with the means to manage and track its SFM performance for the purposes of continual improvement.

A.4.2 Required activities

Note: *This commentary is related to Clause 4.2.*

The SFM requirements create a framework that facilitates effective and consistent on-site forest management while focusing on continual improvement. To be certified, the organization needs to meet the SFM requirements, which include the public participation, performance, and system requirements specified in Clauses 5, 6, and 7. All of the SFM elements, as well as other values identified through the public participation process, are addressed by establishing objectives, indicators, and targets for the specific DFA. An SFM system is established and maintained that includes the following components:

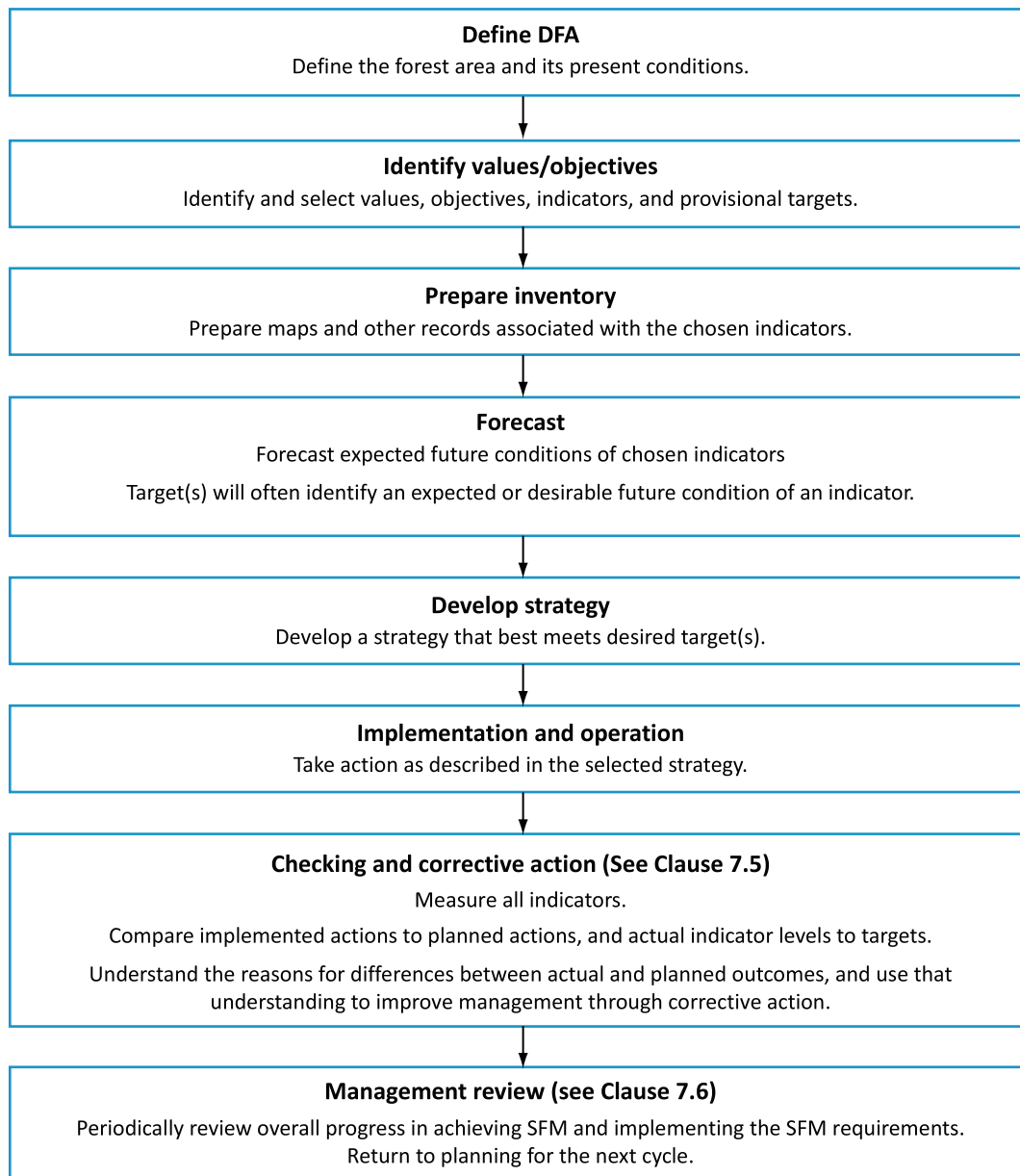
- policy;
- planning;
- implementation and operation;
- checking and corrective action; and
- management review to achieve continual improvement.

Adaptive management

The SFM system requirements are based on the principle of adaptive management, which enables and encourages the improvement of management actions and practices based on knowledge gained from experience. The organization should incorporate adaptive management concepts when implementing and maintaining the SFM system.

Forest ecosystems change continuously as a result of both human and non-human influences. SFM necessitates the establishment of relationships between forest values and management actions. Adaptive management facilitates knowledge of these relationships at the temporal and spatial levels at which forest systems are managed. SFM in accordance with this Standard uses adaptive management to achieve continual improvement. This is done by regularly monitoring and assessing a set of core and locally selected indicators and by modifying forecasts, activities, and plans based on this information (see Figure A.1).

Figure A.1
Adaptive management as applied to forests
 (See Clause A.4.2.)



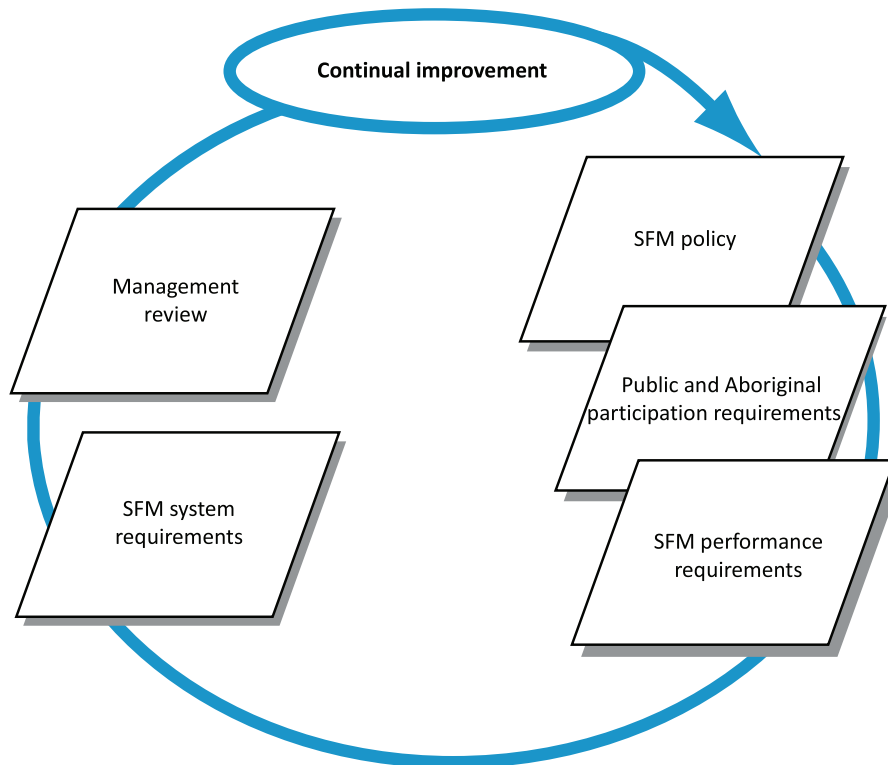
Continual improvement

Continual improvement (see Figure A.2.) and overall progress towards SFM are achieved when all SFM requirements are aligned and working together. Each of the SFM requirements has specific considerations, and each is dependent on the others to be effective.

SFM policy and management review are the fundamental generators of continual improvement. The SFM policy sets the foundation for SFM for the organization and acts as a guide. Management review provides an opportunity for the organization to examine its performance against the SFM requirements, both individually and collectively. The review, which takes place annually or more frequently, maintains

the continual improvement cycle through specific guidance, direction, and the allocation of necessary resources.

Figure A.2
SFM continual improvement loop
(See Clause A.4.2.)



A.5 Public and Aboriginal participation requirements

A.5.1 General requirements

Note: This commentary is related to Clause 5.1.

Public participation is a process of engagement that incorporates a diversity of values into SFM. (For more information on public participation, see Beckley et al., 2006.) The public participation process specified in this Standard does not replace the Crown's legal duty to consult with Aboriginal Peoples. Members of the public are widely considered to have the right to be involved in the management of publicly owned forests. Private forest landowners can voluntarily adopt processes with extensive public input. Through their participation in the process, citizens can enhance their knowledge of SFM in general and of other interests and values related to local forests. They also gain a valuable opportunity to be involved in the decision-making process for local forests.

Implementation of a public participation process as specified in this Standard gives the public an opportunity to be involved proactively in the management of a DFA. Interested parties are invited to have input in the major steps of SFM, and the organization has an obligation to heed such input, either

by accepting it and revising management accordingly or by responding with specific reasons for not accepting it.

Public participation processes, however, have their limits. In a DFA-specific process, participants should not expect to be able to change existing public policies, laws, and regulations established by governments, nor to promote a concept that is illegal. A public participation process for SFM under this Standard respects existing authority for decisions associated with the use and management of the DFA.

Effective public participation processes accommodate the public's wide range of knowledge, interests, and involvement with regard to SFM, as well as its differing cultural and economic ties to the forest. The approach to public participation may vary according to the DFA, the desired outputs, and the specific needs and rights of interested parties. A variety of strategies for public participation might have to be employed on a single DFA in the development and implementation of the SFM requirements. For example, one strategy is to involve a local group of interested and affected parties on an ongoing basis. This strategy could be complemented by communication with a broader public to increase awareness and understanding of SFM and to provide a mechanism for soliciting a wide range of input into the development and implementation of the SFM requirements.

The organization will be implementing the SFM requirements in an environment where other decision-making processes already exist. The organization will need to take previous planning into account and build upon existing management systems, public processes, and decisions relevant to the DFA, even though they might be applicable to a land base larger than the DFA. The organization might have an opportunity to use existing public participation processes when implementing the SFM requirements. Where the outputs of such processes are regulatory or policy requirements of the jurisdiction in which the DFA is situated, these requirements should be reflected in the SFM system.

The organization can build on the results of existing or former public participation processes, but might need to refine and/or expand them to apply specifically to the DFA and to meet the public participation requirements of this Standard. Where existing processes do not address all the public participation requirements of this Standard, the organization should ensure that the gaps are filled through complementary measures.

A.5.2 Interested parties

Note: *This commentary is related to Clause 5.2.*

Public participation

To seek representation of those directly affected by or interested in forest management in the DFA, the organization needs to have an understanding of the relevant interests and positions of local, interested parties. In addition, it is important that the organization consider the broader public interest, particularly where decisions are likely to be seen as regionally significant or contentious. The organization openly seeks representation from DFA-related workers and/or their union representatives.

Interested parties can be engaged in public participation processes in several ways. Specific groups or individuals can be selected and personally invited to participate. Alternatively, parties may be invited to nominate a representative. Where it is advisable on practical grounds to restrict the number of participants, clear criteria for selection should be established and a mechanism should be developed to provide those interested parties not selected with the opportunity to have input in the process.

An organization seeking certification could benefit from knowing the reasons for a person's or group's lack of participation, as it might be within the organization's ability to facilitate such participation. Reasons that might be associated with lack of participation can include issues related to representation

and participation, the relationship between the organization and interested parties and/or Aboriginal People, court hearings pertaining to relevant issues, or land claim issues. It is likely beyond the organization's ability to control or remove some impediments to participation (such as land claim issues), but in other cases (such as the relationship between the organization and interested parties), it might be feasible for the organization to initiate discussions on solutions that would enable the desired participation.

Aboriginal participation

The encouragement of Aboriginal forest users and communities to become involved in identifying and addressing SFM values can vary from community to community, but always begins with a clear respect for their rights, values, and traditional knowledge. From a foundation of respect, an organization is able to involve Aboriginal representatives in the decision-making process based on their interests, values, and traditions, and integrate their knowledge into management planning at the outset. This can result in opportunities for capacity-building, Aboriginal employment opportunities, and business development with Aboriginal contractors and businesses, including joint ventures.

If an organization approaches an Aboriginal forest user or community with an understanding of what they might expect from the engagement and what some of their concerns might be, the chances of engaging effectively and alleviating concerns are increased. When attempting to engage Aboriginal Peoples in a meaningful way, an organization should

- approach the Aboriginal community to determine the appropriate authority on the theme of SFM. The appropriate authority might be the elected Chief and Council, or a forestry committee established by a band. The appropriate authority can vary by community;
- have a background on Aboriginal Peoples and the rapidly changing legal context;
- have an understanding of existing provincial policies and legislation on Aboriginal participation and consultation; and
- be open to the perspectives of Aboriginal Peoples on their participation and on key aspects of SFM.

Information about the SFM plan should be provided to Aboriginal communities associated with the DFA (e.g., through workshops or training sessions), particularly if they are not already receiving information through active participation in an advisory group. Providing this information can facilitate mutual understanding and encourage further Aboriginal participation.

Several reasons might be associated with a lack of participation from Aboriginal groups, including but not limited to

- treaty engagement;
- land claim issues;
- court hearings pertaining to relevant issues;
- issues related to resources, representation and participation; and
- the relationship between the organization and interested parties and/or Aboriginal Peoples.

The organization should provide interested Aboriginal communities with options for participation in the process which could include being part of the broader public participation process and/or having a separate engagement process that operates in conformity with the operating procedures of the PAG.

Participation without prejudice to title and rights

This Standard recognizes that Canadian forests have special significance to Aboriginal Peoples. It further recognizes the unique rights and legal status of Aboriginal Peoples, and that they possess expertise, knowledge, and insights concerning SFM, derived from their traditional practices, beliefs, and

experience. Aboriginal forest users and communities require unique consideration in the public participation process.

Aboriginal Peoples who have an interest in or who are affected by forest management in a DFA should be given an opportunity to contribute their knowledge to the process of setting values, objectives, indicators, and targets. In some cases, this opportunity might necessitate a separate process of Aboriginal participation.

Some jurisdictions have specific regulations or policies regarding Aboriginal participation. Even where regulations or policies are in place, and especially where they are not, the organization should seek out guidance from Aboriginal Peoples regarding the best methods and/or frequency of contact.

Open, inclusive, and responsive participation

An organization seeking certification is able to demonstrate efforts to engage interested parties in the public participation process. When interested parties elect not to participate in or to disengage from the process, the reasons for these decisions, including any efforts made to continue their participation are documented. Such documentation may be in the form of a list that tracks participation, reasons for change in participation levels, and efforts to retain a range of interests.

A.5.3 Process: Basic operating rules for advisory groups

Note: *This commentary is related to Clause 5.3.*

The initial setting up of a public participation process for a specific DFA will be a function of the range of interested parties and their values and needs. Organizations should encourage the development of public participation processes that are appropriate to local circumstances. To ensure that the public participants have some degree of ownership of the process in which they are being asked to participate, this Standard specifies requirements for agreement on the operating rules that guide the process. This involves a determination of the relative importance of the required characteristics of a public participation process according to local circumstances. For example, if participants exercising their responsibility under this Clause 5.3 jointly determine that a dispute-resolution mechanism [Item a) xiv] is unnecessary, and a rationale is provided, then such a process would not be included in the operating rules.

Public participation is not confined to a single event; it is an ongoing process. It consistently provides input toward the continual improvement of the organization's fulfillment of the SFM requirements, and continue to do so during the monitoring and follow-up phases of the SFM system. Public participation processes involve development and continual adjustments as the participants change and as they gain experience with the process.

i) Content

The operating rules should specify the range of considerations and issues to be addressed in the process.

ii) Goals

The aims or purposes for the public participation process should be defined. The goals should address the expectations of the interested parties that have initially chosen to participate.

iii) Timelines

The operating rules should specify the expected duration of various stages of the process, including delivery dates for key outcomes. Timelines should be sensitive to both efficiency (i.e., implementation

of this Standard without undue delay) and effectiveness (i.e., taking sufficient time to meet SFM requirements and successfully complete key tasks). Operating rules should include the flexibility necessary to adjust to the needs of changing membership and increasing experience with the process.

iv) Internal and external communication

The success of the public participation process is greatly influenced by the extent and quality of communications, both internal and external. Consideration should be given to the ways in which

- the organization will communicate with other participants;
- participants will communicate and interact with each other; and
- participants will communicate with their respective constituencies and the broader public. [See commentary to Item vi).]

v) Resources

Effective public participation requires resources for successful implementation. The operating rules should specify the resources that will be made available to the process, by which parties, and under what conditions. Consideration should be given to the following:

- Human resources are needed to implement and service the process.
- Physical resources include meeting places and transportation services.
- Financial resources are needed to defray process costs and to underwrite the direct expenses of participants attending meetings.
- Relevant information, a key ingredient in any planning process, should be assembled and put in a format that is readily accessible to participants.
- Technological resources are mainly the analytical tools associated with planning, including geographic information systems, remote sensing images, and various communications tools.

vi) Roles, responsibilities, and obligations of participants

Expectations of both the participants and the organization should be clear at the outset and throughout the public participation process. Participant representation (do they represent themselves or an organization or affiliation?), attendance (are alternates permitted? how many meetings can a participant miss?), continuity, and similar matters are critical to credible, efficient, and valuable public participation. Where the participants come into the process representing other organizations, they have the responsibility to keep their respective constituencies regularly apprised of the process and report the views of their constituents back into the process.

vii) Conflict of interest

The public participation process should have a system to deal with conflicts of interest, particularly when participants have relationships with the organization or any other party that are required to be declared.

viii) Decision-making methods

For effective engagement, participants should know how meetings will be conducted and decisions made. It is particularly important to establish

- whether meetings will use a specific method (e.g., consensus seeking); and
- if there is any voting, how it will be done.

ix) Authority for decisions

The operating rules should clarify which participants in the process have the authority to decide on specific matters. Participants should know about the organization's regulatory responsibilities; this helps define the scope of the organization's authority and of the public participation process.

x) Mechanisms to adjust the process as needed

Changes to the public participation process are sometimes needed during implementation as participants become more involved. Such changes should be made in accordance with protocols specified at the beginning of the process. Public advisory groups might need to adjust these protocols as they become more mature and experienced. The requirements of mature public advisory groups may differ from the requirements outlined in this Standard for the initial creation of a public participation process.

xi) Access to information

Information is critical to a sound public participation process. Participants, and particularly the organization, should bring forward relevant information. To understand SFM as described in this Standard, it is vital that the organization ensure that all participants be given an opportunity to read this Standard.

Conditions of confidentiality of certain information should be specified, if applicable. This Standard recognizes the rights of Aboriginal Peoples to their intellectual and cultural knowledge, innovations, and practices, and the need to protect sensitive information when it is shared. Generally, information presented by any party in a forum that is part of the public participation process becomes public information. Conditions on the use of any information, from any source, exchanged in separate Aboriginal consultation processes may be governed by prior agreements among all the parties involved.

xii) Participation of industry, governments, Aboriginal communities, appropriate experts, and other interested parties or individuals

Government representatives, representatives of the Aboriginal community, industry representatives, and/or appropriate experts may become regular participants in the process or they may take observer or technical-support roles. Non-local interests might also have a desire to provide input. The means of ensuring the necessary input from these groups should be agreed upon in advance. In addition, Aboriginal communities should be provided with the opportunity to participate in ways that meet their specific needs.

xiii) Involvement of experts

In addition to experts who are members of the public participation process or regular contributors of input to the process, the participants might find it useful to invite experts to discuss technical issues on an ad hoc basis. One approach is to design special ad hoc forums for dialogue between such appropriate experts, members of the public participation process, and local interested parties.

xiv) Dispute-resolution mechanism

A common decision-making approach used in public participation processes for forest management in Canada today is that of consensus, which might or might not require unanimity. Given the heated debates that sometimes surround contemporary forest management, total agreement can be difficult to reach on some DFA-specific issues. The operating rules should anticipate this circumstance and outline a means of dealing with conflict. The group may want to consider a process for removal or exclusion of a participant who is not willing to work in a consensus building environment. Many guides are available to

help participants understand participatory and/or consensus-seeking processes and develop means to resolve disputes. The guiding principles published by the National Round Table on the Environment and the Economy (reproduced in Table A.1.) are of particular relevance since they were developed in a Canadian context.

xv) Mechanism to measure participant satisfaction with the process

While developing the initial rules for the establishment of a public participation process, it is important to think of the longer term and the need to maintain an on-going process that meets the needs of the participants. To achieve this objective the rules established at the start of the process should identify a mechanism to measure on-going satisfaction with the process as it matures.

Participatory processes work best when participants are satisfied with how the process is running. Therefore, process conveners and facilitators need to know how participants are feeling about the means and protocols of engagement. Different methods can be used for gauging participant satisfaction, including qualitative interviews and quantitative surveys.

Table A.1
Guiding principles of consensus processes
(See Clause A.5.3.)

Principle No.	
1	Purpose driven People need a reason to participate in the process.
2	Inclusive, not exclusive All parties with a significant interest in the issues should be involved in the consensus process.
3	Voluntary participation The parties who are affected or interested participate voluntarily.
4	Self design The parties design the consensus process.
5	Flexibility Flexibility should be included in the process to enable it to adjust as it matures.
6	Equal opportunity All parties must have equal access to relevant information and the opportunity to participate effectively throughout the process.
7	Respect for diverse interests Acceptance of the diverse values, interests, and knowledge of the parties involved in the consensus process is essential.
8	Accountability The parties are accountable both to their constituencies and to the process that they have agreed to establish.
9	Time limits Realistic deadlines are necessary throughout the process.
10	Implementation Commitment to implementation and effective monitoring are essential parts of any agreement.

Note: Adapted from NRTEE, Building Consensus for a Sustainable Future: Putting Principles in Practice (1996).

A.5.4 Work of the advisory group

Note: *This commentary is related to Clause 5.4.*

It is the organization's responsibility to provide interested parties with an opportunity to participate in the activities specified in Clause 5.4. However, the level of involvement will be up to the participants. If the participants choose to focus only on the items that they consider to be significant, it remains the responsibility of the organization to address all of the items specified in Clause 5.4 and to report back to the participants on its decisions. The participants would then be in a position to provide input, should they so desire.

The Aboriginal community may elect to establish a separate advisory group. Where the organization has successfully established one or more advisory groups, these groups are provided the opportunity to work with the organization to identify and select the values, objectives, indicators, and targets specific to the DFA, to develop, assess, and select one or more possible strategies related to each of the targets, and to review results in achieving the SFM plan. It should be clear to participating interested parties that the SFM plan will evolve over time as issues relevant to the DFA are discussed and performance measures are evaluated.

The issues referenced in Clause 5.4 e) might arise in association with the discussion items specified for each criterion in Clause 6.3 or during other discussions that are part of the advisory group process. The outcome of discussions regarding an issue(s) relevant to SFM in the DFA should consist of one or more of the following:

- demonstration that the issue raised is not applicable to the DFA;
- identification of one or more DFA-specific values and the associated objectives, indicators, and targets;
- identification of the issue as a topic that the public participation process should discuss on an ongoing basis;
- establishment and implementation of performance-based thresholds and specifications to address the issue;
- addressing the issue through policy, operational controls, and/or best management practices;
- demonstration that the issue has already been addressed through satisfaction of a previously identified value; and
- other means, developed and accepted through the public participation process, that clearly and adequately address the issue.

A key role for the advisory group is the development of values, objectives, indicators, and targets for the DFA. Outcomes of this process, at minimum, comply with existing government laws and regulations. The process also respects the findings of any earlier formal public participation processes that have developed values, objectives, indicators, or targets relating to the SFM elements at a landscape or regional level in the area in which the DFA is situated.

A.5.5 Public communication

Note: *This commentary is related to Clause 5.5.*

Access to Information

To meet the requirements of Clause 5.5, Items a) and b), it can be helpful for the organization to provide information for interested parties to review and comment upon. Different participants might request varying amounts and types of information. While access to all relevant information should be provided, the organization is not required to disclose information on internal proprietary and confidential matters, such as personal information about staff or information that might affect the organization's competitive advantage. In some cases, summaries of information can be provided.

Interested parties involved in the advisory group can represent broader constituencies and should relay information to those constituencies. However, the organization is required to provide information to a broader public about the process and progress of implementing the SFM requirements. The strategies for disseminating such information include

- public announcements in the media;
- development of a website;
- open houses;
- town meetings;
- smaller meetings with specific interest groups; or
- other forms of communication.

Opportunities should be provided for sharing information, views, and values. Suggestions received through the broader process of public communication should be considered by the advisory group and the organization and responded to in a timely fashion.

Decision making

The requirements of this Standard include a rigorous process designed to provide interested parties with an opportunity to influence decisions and to provide input on important issues. However, this does not mean that the decision-making power resides with the public alone. The organization demonstrates that it takes the public input seriously and that it is responsive to and respectful of this input. In doing so, the organization should clearly explain how decisions, including any trade-offs, are reached.

Annual reporting

The organization prepares information that describes their progress in meeting and maintaining the SFM requirements and makes that information available to the public. Specifically, this annual reporting should demonstrate the organization's performance against SFM targets and how those targets are aligned with SFM values, objectives, and indicators. The annual report should be open and factual so that the reader can be confident that all of the SFM requirements continue to be met and that the organization is living up to its SFM policy statement and its commitment to continual improvement. Progress, success, shortcomings, emerging issues, future plans, corrective actions, and management commitment could be some of the topics to be addressed by the annual reporting process. Because some readers of the report might not have been involved in the public and Aboriginal participation process, information regarding any major issues related to SFM in the DFA should be included.

The provision of appropriate information to the organization's DFA-related workers, contractors, and other interested parties serves to motivate workers and encourage public and Aboriginal understanding and acceptance of the organization's efforts to improve its SFM performance.

The annual reporting process can use print or electronic media to assist in reaching the target audience.

Audit reports

Third-party audit reports that are made available to the public respect the confidential nature of sensitive information such as an organization's business arrangements or cultural information deemed to be sensitive to Aboriginal communities. When determining what information is confidential, maintenance of the transparency of the process is an important item to consider. Clause 5.5 g) contains a list of the minimum information to be contained in an audit summary report.

A.6 SFM performance requirements

A.6.1 DFA-specific performance requirements

Note: This commentary is related to Clause 6.1.

Because values represent what is important in and for a DFA, the organization should have a clear and transparent mechanism for identifying DFA-specific values and translating them into detailed targets that can be met with implementation of a chosen strategy. This Standard identifies a basic set of mandatory core indicators and specifies a process for identifying other indicators and setting associated targets. The values, objectives, indicators, and targets identified during the public and Aboriginal participation process may be documented in a table.

Table A.2
Sample integration of public and Aboriginal participation process content requirements and DFA performance requirements
 (See Clause A.6.1.)

Public and Aboriginal participation process content (see Clause 5.4)	Setting DFA performance requirements (see Clause 7.3.5)	Explanations and examples
Identify and select values, objectives, indicators, and targets.	For each element, identify one or more DFA-specific values.	When considering Element 1.2, Species diversity, the habitat for a population of pileated woodpeckers could be a DFA-related value. There can be many values for each element.
	For each value, identify one or more objectives.	For the pileated woodpecker habitat, the objective could be to maintain the habitat at the present level. Limit objectives to one per value; however, in some circumstances, more than one objective might be necessary.
	For each value, identify the core indicator and any other locally selected indicators.	For the pileated woodpecker habitat, the indicator might be the habitat carrying capacity, measured by the number of breeding pairs per 100 km ² Each value can have more than one indicator.
	For each indicator, provide data on current status and identify a target.	For the pileated woodpecker habitat, the current habitat carrying capacity might be 20 pairs per 100 km ² , and the target might be a minimum of 20 pairs per 100 km ² .
Develop appropriate strategies.	Develop appropriate strategies to achieve the targets.	Each strategy includes all the major actions that could affect the habitat for the pileated woodpecker (e.g., access, timber harvest, regeneration, protection).
	Describe the expected response of each indicator in relation to the target.	For the pileated woodpecker habitat, quantitative habitat modeling indicates that the target of 20 pairs of pileated woodpeckers per 100 km ² will be met. The methods, assumptions and limitations for making the forecast are also described.
Review the SFM plan.		This step allows all parties to agree that the SFM plan properly reflects the decisions reached throughout the process so far.

(Continued)

Table A.2 (Concluded)

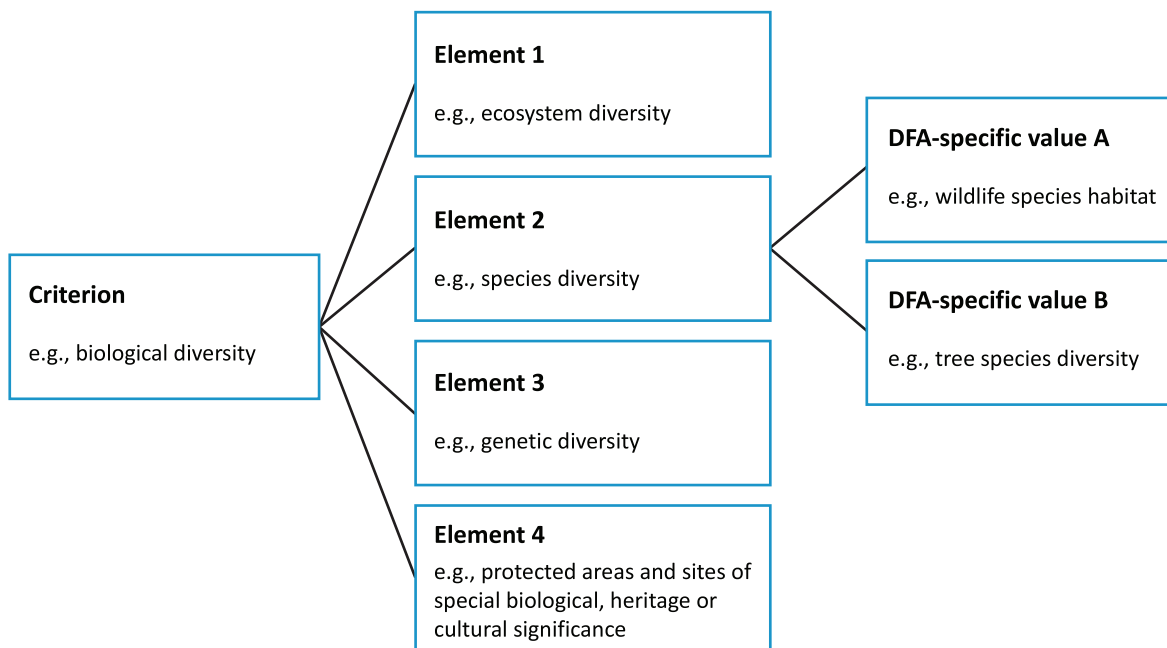
Public and Aboriginal participation process content (see Clause 5.4)	Setting DFA performance requirements (see Clause 7.3.5)	Explanations and examples
Review monitoring programs, evaluate results, and determine opportunities for improvement.	Design field measurement programs and implement them.	Collect appropriate data to track indicators and any other variables deemed important in checking the performance of forecasting models.
	Analyze results and include them in the public and Aboriginal participation process for interpretation and discussion.	All parties should examine monitoring data in the context of the forecasts and discuss how to improve the SFM plan for its next revision/iteration.

Identifying DFA-specific values

A set of forest values are to be created that pertain specifically to the DFA. In the public and Aboriginal participation process, interested parties might wish to begin by identifying DFA-specific values and then organizing them under the elements. Alternatively, they might begin by considering the elements and then ensuring to identify at least one DFA-specific value for each element. The SFM criteria and elements specified in Clause 6 serve as organizing concepts and ensure that DFA-specific values cover a comprehensive range of SFM considerations. (See Figure A.3.)

During the process, interested parties might identify DFA-specific values that are not apparently associated with any of the SFM elements. In such a case, the number of elements might have to be increased to include the additional values.

Figure A.3
Criteria, elements, and DFA-specific values
 (See Clause A.6.1.)



Note: Objectives and indicators are identified for DFA-specific values in Figure A.4.

Defining objectives

Each value will have at least one objective that describes the desired future condition for the value. Interested parties may develop more than one objective for each value. In such a case, the parties should strive to ensure compatibility among the objectives, aiming for mutually supporting objectives rather than conflicting ones.

Identifying core and locally selected indicators

Indicator development

Indicators are the means of measuring or describing the state or condition of forest values. Some indicators are prescribed as core indicators in Clause 6.3. Others are identified through the local public and Aboriginal participation process. Interested parties are guided in various ways regarding indicator selection, including:

- their own ideas about useful indicators; and
- indicators related to government regulations and policies that relate to the DFA.

The organization's own internal management policies and procedures can dictate the need for certain indicators, and the interested parties might find it useful to consult with technical experts. The final indicator set is a result of the input from a number of sources.

Indicator selection

Selecting indicators involves defining what is to be measured and why it is important. Indicators pertaining directly to forest conditions are preferred over those that pertain to SFM activities. Direct

measurement of a forest condition provides a better gauge of most values than measuring an activity that influences the condition.

In some instances, direct measurements of forest conditions are not feasible, and an indirect measurement is necessary. In such cases, the relationship between the selected indicator and the condition being measured should be clearly established and periodically checked to ensure that the stated relationship remains valid. For example, if a certain ecosystem type is used as a surrogate for the population of a rare species, it is necessary to confirm periodically that the rare species is present in the ecosystem type.

In the indicator selection process, interested parties should apply a set of quality criteria when assessing whether proposed indicators should be retained for use. Such criteria should consider the following:

- feasibility — the process of monitoring indicators should be practical, cost effective, and efficient.
- measurability — targets can only be set for indicators that can be measured;
- predictability — indicators whose future levels can be predicted with reasonable accuracy should be used;
- relevance — indicators should be clearly applicable to their associated values;
- understandability — indicators should be simple, clear, and easy to understand; and
- validity — indicators should be consistent with the scientific understanding of the value they measure and should be technically valid (objectively obtained, documented, comparable, and reproducible).

Setting targets

Each indicator requires one or more targets to define the desired future condition. A target may be a specified level for an indicator at a given point in the future or a series of such levels for a corresponding series of points in the future. See Table A.2 or a sample target.

Targets can be set in a variety of ways. Using the “bull’s eye” concept, a target could call for the indicator to show a fixed quantity or a fixed range. Alternatively, the target could specify a minimum or maximum value for the indicator. Whichever approach is chosen, targets should specify acceptable departures (e.g., the size, location, duration, and frequency of a deviation) from the chosen limits.

There is a danger in trying to set firm targets at the beginning of the planning process, as it is possible that no feasible strategy can be designed and implemented to meet all targets. A better approach is to set tentative or provisional targets at the beginning of the planning process, and then iteratively develop and assess strategies and adjust targets until a match is obtained between an appropriate set of targets and an acceptable strategy (see Table A.2).

A key concept in determining appropriate SFM performance in relation to ecological elements is the range of natural variation. For each chosen indicator, consideration should be given to a reference time frame, the limits on the range of natural variation, and behaviour of the indicator within these limits. As part of the public and Aboriginal participation process, the organization and interested parties should examine carefully and discuss fully the role of the range of natural variation in the context of SFM in the DFA.

Designing and evaluating strategies

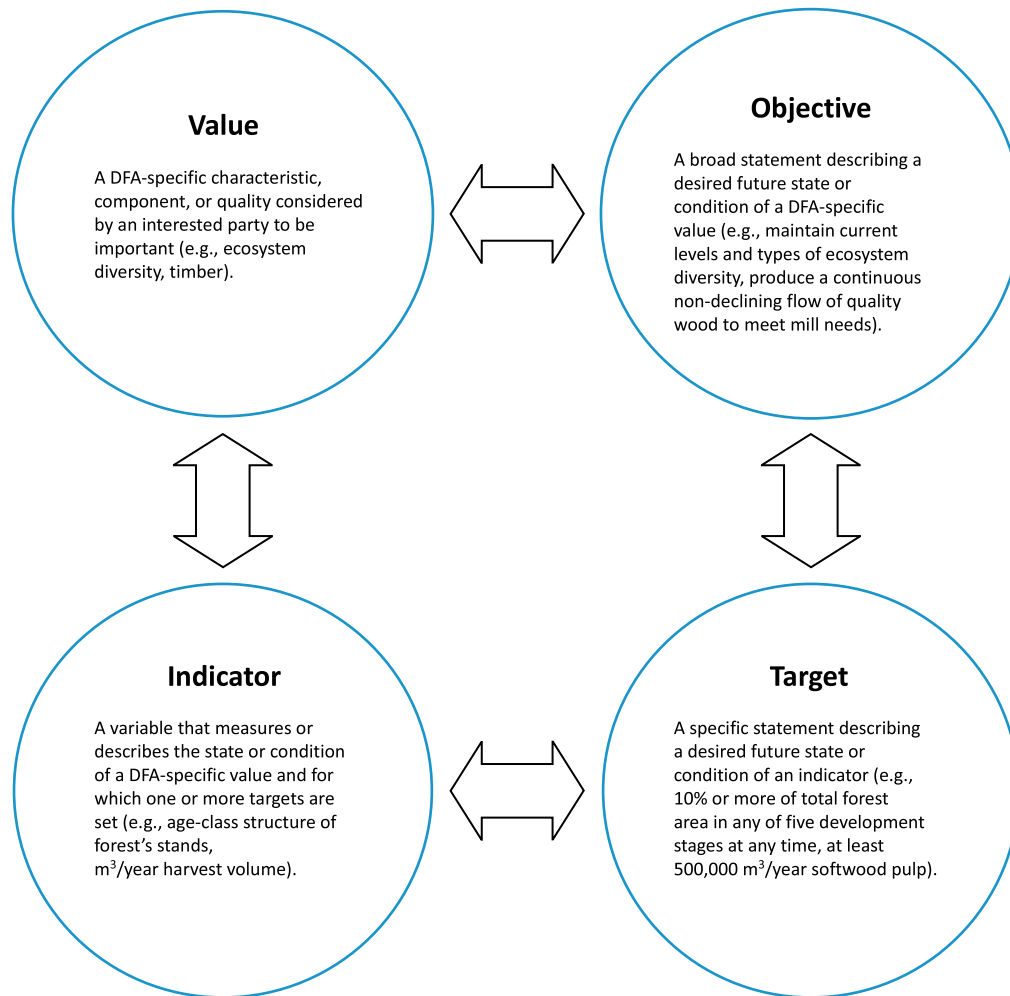
In the context of this Standard, a strategy comprises the actions, specified according to type of action and time and place of implementation, that are proposed to achieve one or more targets. A strategy can be as simple as holding workshops and open houses to meet targets for satisfactory public and Aboriginal participation. Conversely, it can be as complex as a comprehensive set of silvicultural

prescriptions to meet targets for a sustainable wood supply while conserving biodiversity, water, and soil, and promoting carbon sequestration. A particular strategy can relate to a specific target (e.g., workshops relate to public participation) or can relate to targets for many indicators at once (e.g., a silviculture strategy relates to biodiversity, forest productivity, soil and water, carbon budget, and wood supply).

If only one type of action is appropriate for achieving a target, then only one strategy is developed. However, for many indicators, a range of strategies might be appropriate. For example, in exploring how to meet targets for habitats of focal species (see Element 1.2 in Clause 6.3.1.4), the organization and interested parties might wish to explore the relative effectiveness of different means of harvesting timber (e.g., clear-cutting vs. partial cutting) or regenerating harvested areas (e.g., natural vs. planting). Possible strategies should be limited in number (for tractability of assessment work) and easily distinguished (so that any analytical results can show how the indicator responses to the assessed strategies actually differ).

A good strategy is one that has the best potential to help managers achieve established targets. Where there is essentially only one strategy deemed to work in this regard, strategy assessment is simple. However, where several strategies are under consideration, strategy assessment and selection can be complicated. For example, where a set of silviculture strategies has implications for many indicators specified in Clause 6.3, strategy evaluation is a complicated exercise of examining forecasts for all the relevant indicators under the full range of strategies considered.

Figure A.4
Relationship of values, objectives, indicators, and targets
 (See Figure A.3.)



Forecasts

An important part of implementing sustainable forest management requirements is comparing the indicator conditions that evolve over time with those that were forecasted (expected), then assessing the acceptability of variances. While a quantitative analysis might be needed to forecast some indicators (such as those found in timber supply models), other indicators will rely more on expert and local input.

Forecasts for quantitative indicators are normally made using models that can range from simple equations to complex spatial models. For example, forecasts for qualitative and conformance-based indicators are normally made using non-analytical techniques. In addition, forecasts may be based on analysis units that are smaller or larger than the DFA, if they are appropriate for the indicator and make best use of existing data and analysis. Examples include timber supply area resource data and associated analyses (volume-based tenures), wildlife habitat areas, etc. Explanations should specify the particular time and space considerations since many indicators change over time and are unevenly distributed across the DFA or analysis units (which may be larger or smaller than the DFA).

Organizations should address two issues when making indicator forecasts. The first is potential interactions among indicators. Many of the indicators chosen to represent DFA-specific values will not be independent of each other; forecasts should recognize these interdependencies. The second issue relates to the fact that some indicators are influenced as much by human actions within the DFA that are not related to SFM as they are by actions related to SFM. Examples include recreational forest use, and exploration and extraction of minerals, oil, or gas from below the earth's surface. In such cases, there can be cumulative effects. In the context of this Standard, the cumulative effects on an indicator are those from both SFM actions and from other actions. Organizations are urged to assess cumulative effects in their indicator forecasting exercises where practicable.

Monitoring indicators and targets

Monitoring is repetitive measurement, or measurement over time. Monitoring delivers the data required to assess management effectiveness. In the context of adaptive management of forests, managers should monitor both the actions they take (to determine if what actually is done matches what was planned) and the effects of the actions (to determine if the desired indicator responses are being achieved and targets met).

Adaptive management is, above all, a learning exercise in which comparisons of expectations with real outcomes can reveal where managers have been successful in delivering on values and where value satisfaction is inadequate. The latter can result from departures from planned actions or from lack of sufficient knowledge to forecast indicator outcomes with confidence. Monitoring provides the data needed to determine the magnitude and nature of differences between forecasts and reality, and the reasons for the differences. Ultimately, the goal is to improve strategies for the next round of SFM planning. Monitoring data and analyses are essential components of an overall assessment of the ongoing validity of values, objectives, indicators, and targets.

In some cases, DFA managers do not have authority to manage for specific public values associated with the DFA land base. For example, the organization has authority to manage wildlife habitats but not wildlife populations.

A.6.2 SFM criteria — General

Note: *This commentary is related to Clause 6.2.*

Successful implementation of SFM requires both a strong process and a comprehensive content. The content of SFM is determined by the values established for the DFA.

In this Standard, the CCFMs SFM criteria continue to be used as a basis for the standard and an additional criterion on Aboriginal rights has been added.

Each criterion is followed by a list of discussion items. These represent issues commonly faced by forest managers and interested parties in DFAs across Canada. As part of the public participation process specified in this Standard, participants discuss each of the items and demonstrate, through clear records, that the issues inherent in the items have been brought to a satisfactory resolution. Re-visitation of the discussion items may be necessary during the SFMP revision process.

Each element is described in a heading followed by an elaborating statement. Core indicators are subsequently identified for use in SFM implementation in accordance with this Standard. Where core indicators have been deemed to apply to several elements, they are repeated under each applicable element.

A.6.3 SFM criteria, elements, and core indicators

A.6.3.1 Criterion 1 — Biological diversity

Note: This commentary is related to Clause 6.3.1.

Canada is a signatory to the United Nations *Convention on Biological Diversity* and has developed a national strategy for biodiversity conservation (the *Canadian Biodiversity Strategy*, 1995). The *Convention on Biological Diversity* recognizes the dependence of Aboriginal Peoples on biological resources and the value of traditional knowledge and practices in the conservation of biological diversity and sustainable use of its components. Biodiversity is an umbrella concept dealing with all living things and their relationships and habitats. It is a complex concept that recognizes ecological, genetic, social, and cultural dimensions related to the conservation and sustainable use of biological resources. A fundamental requirement for biodiversity conservation is the in situ conservation of ecosystems and natural habitats with special focus on scales of time, space, and hierarchical order. Because forests are ecosystems of incredible biological richness, biodiversity is central in the pursuit of SFM.

Landscape ecology provides insight into a range of themes regarding landscape pattern that underpin biodiversity conservation. These include the concepts of landscape composition, configuration, and connectivity. All can be influenced by forest management. Landscape composition as determined by a range of patch types (e.g., forest stands) and matrix (the nature of the surrounding land in which patches are situated) affects habitat suitability for the range of forest species. Configuration or the spatial arrangement of patches can affect distribution of habitat across the range of various species populations. Landscape connectivity, or the connectedness of vegetation cover in a landscape can influence both habitat connectivity (connectedness of habitat patches) and ecological connectivity (the connectedness of ecological processes at multiple scales). Other elements are often considered with connectivity, such as edge or boundaries between dissimilar plant communities (different vegetation types, successional stages, or vegetative conditions). On the whole, connectivity on the managed landscape influences both the species population movement and potential gene flow between remnant patches and the ability of the ecological landscape to continue to functionally support these species populations over time.

Landscape patterns and habitat patch structures in forested landscapes are not static due to various natural and human-induced disturbances at multiple scales, and subsequent forest succession. Concerns in forested ecosystems regarding harvesting and management are often related to species dependent on the amount and distribution of habitat patches that provide interior forest conditions, and the complex structure associated with late successional forests.

Pattern is important. Anthropogenic linear features, such as roads, pipelines, electricity transmission lines, and seismic lines, are often implicated in reducing forest connectivity and increasing fragmentation, as well as contributing to overall forest loss. Uniform patterns created by dispersed cutblocks and relatively short rotation age are generally less desirable. Managers can improve connectivity by leaving corridors, strips and patches of standing timber, and individual trees. In landscapes severely fragmented and/or deforested, reforestation, and afforestation activities can be employed.

Many experts believe that natural disturbance regimes and the range of natural variation in forest ecosystems provide a sound context to understand management of landscape patterns for the conservation of forest biodiversity. These concepts acknowledge that groups of species have evolved with the forest disturbances that occur through natural forces such as fire, insect outbreaks, disease and windthrow. Human disturbances can best be managed by considering rates of natural disturbances and

the structures, shapes, and patterns of the resulting ecosystems and landscapes. Management strategies designed to ensure that the forest continues to function within the range of natural variation are therefore likely to reduce the risk of losing biological diversity. Managers may take guidance from historical or current disturbance regimes, or they may investigate how future climate change might alter the disturbance regimes during the next century. It should be recognized, however, that human-caused disturbances cannot entirely emulate the effects of natural disturbances and that not all aspects of natural disturbances can or should be emulated. Nonetheless, the frequency and patterns of natural disturbance can inform forest management.

Wetlands are a component of forest ecosystems that provide many valuable ecological services. Wetlands are rich in biodiversity and provide important habitat for hundreds of species of plants and animals.

Except for commercial tree species, in most cases the organization has no authority to manipulate plant and animal populations. Rather, it manipulates habitats through management actions focused primarily on trees. Habitat, in terms of both quantity and quality, is a key component of the health of species populations. Species cannot exist where habitats are inhospitable. However, just because the habitat is suitable does not mean that a species will occupy it to its fullest capacity; other forces, such as abiotic events (i.e., severe weather), competition, predation, diseases, and human activities can prevent a species from occupying its normal range at normal densities. For forest-dwelling species, managers should take special care with species that exist at their range limits, that exist in isolated populations, and for which knowledge is deficient.

In conservation planning, protected areas are widely seen as pivotal in conserving biodiversity and maintaining natural ecological processes. In some circumstances, small protected areas can serve vital protection functions (e.g., a small critical habitat for a species); in others, large protected areas are required. Conservation design strives to establish networks of protected areas that are representative of both the enduring landscape features and the local or regional biodiversity.

Silvicultural practices, including timber harvesting, can either degrade or enhance biodiversity values. For example, uninformed timber harvesting can destroy forest habitats for some species, whereas sensitive timber harvesting can actually be used to improve habitat conditions. Key attributes of silvicultural practices that influence biodiversity include type of treatment, spatial extent and layout, timing (seasonal and long term), and intensity. An example of a habitat element that requires special attention in the design and implementation of forest treatments is deadwood, whose snags and downed logs provide habitat for a diverse range of forest species.

In some parts of Canada, invasive alien species have the potential to threaten native forest biodiversity. Examples include the Emerald Ash Borer in southwestern Ontario and the Brown Spruce Longhorn Beetle in Nova Scotia. SFM demands prudence in monitoring and treatment design to limit the spread of invasive alien species into Canadian forests. This might mean that the organization agrees not to engage in practices where there is a risk of introducing invasive alien species, or commits to undertaking special actions should an invasive alien species become established, through no fault of the organization, in the DFA.

Some have raised concerns over whether tree breeding programs are gradually reducing the genetic diversity of native forests. Attention should be given to the nature of the gene pools associated with seed stocks of native species, as well as effective population sizes in seed orchards.

A.6.3.1.3 Element 1.1 — Ecosystem diversity

Note: *This commentary is related to Clause 6.3.1.3.*

Ecosystem conservation represents a coarse-filter approach to biodiversity conservation. It assumes that by maintaining the structure and diversity of ecosystems well-distributed across the landscape, the habitat needs of various species will be provided. For many species, if the habitat is suitable, populations will be maintained. This concept is important for poorly known species. Two key characteristics of forest ecosystems are the vegetation community types and its seral stages. The community type is normally described in terms of the species composition since it is an expression of the unique combination of climate, soil moisture and nutrient regimes of the site. The seral stages are driven by succession and disturbance processes and are normally described in terms of age classes. These two factors are strong predictors of the biotic communities that will inhabit both forest stands and the entire forest landscape.

Ecosystem area by type

In conservation biology, ecosystem representation is about making sure that ecologically distinct ecosystem types are represented in the non-commercial (unmanaged, natural) land base to ensure that little-known species and ecological functions are sustained and benchmarks of the range of ecosystems are maintained in an “unmanaged” state in case we need to study them at some point.

An analysis of ecosystem type representation (often synonymous with the term habitat types) within the DFA illustrate the existing distribution, abundance, and patch size class, both within the non-commercial landscape and the commercial landscape. Representative ecosystem types should be summarized at a scale that is relevant ecologically (fitting with natural landscape disturbance types and scales) and useful for management. Hierarchical forest ecosystem classification schemes may be useful to help determine appropriate scales. For example, in British Columbia the most relevant scale may be the biogeoclimatic subzone level. However, for practical management, subzones with similar disturbance patterns and broadly similar ecosystem types may best be grouped together. Good representation of ecosystem types will also have an age distribution that reflects the natural pattern.

Ultimately it is best if all ecosystem types are adequately represented and well-distributed across those parts of the management unit where they are naturally found. Ecosystem types that may be poorly represented in some form of protected status, could be priority candidates for forest planning and management actions within the commercial forest. For example, designations for protection of non-timber values that totally or partially constrain timber harvest could be evaluated for potential inclusion of underrepresented ecosystem types. Other non-forested or special ecosystem types, for example karst features, and rare soil types, should also be incorporated in the planning process. Management activities including infrastructure (e.g., roads, bridges, landings) should be planned in a manner consistent with required protection of representative ecosystem types.

Forest area by type or species composition

An analysis of forest area by stand type or species composition allows for an understanding of landscape pattern elements that is more general than representation of ecosystem types. Again information should be summarized at a scale that is relevant ecologically and useful for management.

Forest area by seral stage or age class

Analysis of forest area by seral stage or age class also provides a more general understanding of some landscape pattern elements, in this case related to stand age and the associated structural elements.

Degree of within-stand structural retention

Within-stand structural retention includes important features that provide habitat heterogeneity including downed wood, tree cavities, large trees, and large dead snags. Retention of these structures in the managed forest matrix are important to provide stand structural heterogeneity across the landscape to encourage a diversity of habitats; maintain unharvested refugia in large disturbed areas; assist some species to repopulate the regenerating ecosystem over time; and provide for a degree of connectivity throughout the managed landscape to facilitate movement of species populations.

The four indicators work together to assist managers in managing landscape pattern for conservation of biodiversity. For example, some clear gaps in the representation network of ecosystem types may be deemed acceptable in the short term considering the distribution of stand types and age classes. As well, stand level retention could be used across the managed landscape in some ecological units as an interim strategy to compensate for perceived issues in the other indicators.

A.6.3.1.4 Element 1.2 — Species diversity

Note: *This commentary is related to Clause 6.3.1.4.*

While ecosystem conservation is the coarse-filter approach to biodiversity management, species diversity is the fine-filter approach. For most species, forest managers only have the ability to manipulate habitats, not species populations. In some cases, legal protection is afforded to the habitat or elements of the habitat of a species whose population is in decline and may be at risk of extinction (species at risk). Other species can become the focus of management (focal species) for a wide range of reasons such as their significance to Aboriginal communities or their sensitivity to disturbance or influences such as climate change. Exploitation of protected plant and animal species at risk for commercial purposes is strictly prohibited, and managed by government agencies, not forest managers.

To account for the degree of habitat protection provided for selected focal species, including species at risk, forest managers should recognize short-term habitat needs, particularly for critical and core habitats, and consider existing protection plans for species at risk. For the longer term, forest managers can use habitat supply models (as part of forest forecasting exercises) when they exist and are reasonable in order to assess the long-term availability of habitat suitable for selected focal species, including species at risk. To account for concerns that forests be regenerated primarily with native tree species, managers should address and monitor the proportion of regeneration comprised of native species.

Management activities including infrastructure (e.g., roads, bridges, landings) should be planned in a manner consistent with required habitat protection for focal and species at risk.

Forest managers should also acknowledge the risks of introducing and spreading invasive species in the forest, particularly invasive plants and address those risks through monitoring and operational practices.

A.6.3.1.5 Element 1.3 — Genetic diversity

Note: *This commentary is related to Clause 6.3.1.5.*

Ecologists recognize that species diversity rests on a foundation of diversity in gene pools within and among species. Unfortunately, gene-pool diversity is difficult to measure. Until practical indicators of characteristics inherent to genetic diversity are developed, this element should be addressed through discussions and management protocols. For tree species, such discussions and protocols focus on tree breeding programs and seed stocks.

A.6.3.1.6 Element 1.4 — Protected areas and sites of special biological, geological, heritage, or cultural significance

Note: *This commentary is related to Clause 6.3.1.6.*

Protected areas are important for biodiversity conservation. They can help to protect and conserve species that occur within their boundaries and can contribute to conservation across the broader landscape. They are also valuable ecosystems in their own right. A DFA exists within a larger landscape and potentially within a broader land-use planning process. Effective conservation within a landscape encompasses a network of both protected areas and sustainable activities within the DFA and other working parts of the landscape. Organizations should co-operate with provincial managers to determine whether representative samples of the ecosystems present in the DFA are protected at the landscape level either in the DFA or in the adjacent area and should have examples of such protected areas. A peer-reviewed gap analysis may be used to identify the existence and significance of protected areas when determining whether adequate representation of the range of sites has been achieved. When identifying local values and developing objectives, indicators, and targets for biodiversity, there should be alignment with strategic or policy direction provided by the provincial government and the CCFM.

Sites of biological, heritage or cultural significance include critical areas for wildlife habitat, sensitive sites including spiritual, heritage and cultural sites, and unusual or rare forest conditions or communities. A wide range of criteria may be used in their identification. Such sites might need protection or active management to perpetuate the conditions that make them significant. Such management may focus on preventing harmful actions (e.g., fencing or signs to discourage human traffic inside an area or construction of a sheltering structure) or on taking restorative actions (e.g., removal of barriers to periodic flooding of a wetland).

Organizations should ensure that a process is in place to identify any sites of biological, heritage or cultural significance that would be threatened by forest management activities without the implementation of special management strategies. These sites can vary in size depending on the nature of the value identified. Management strategies should endeavour to maintain the specific values present on these sites.

Efforts should be made by the organization to involve willing Aboriginal communities in the identification and protection of sites of cultural significance. To address the issues regarding the sharing of confidential and sensitive information from Aboriginal communities, organizations are encouraged to develop information sharing agreements, such as partnership agreements and memoranda of understanding, that outline ways to protect this information.

A.6.3.2 Criterion 2 — Ecosystem condition and productivity

Note: *This commentary is related to Clause 6.3.2.*

In the context of forests, mitigation of climate change entails managing forests so they can sequester and store more carbon from the atmosphere. Mitigation is addressed under Criterion 4 (see Clause A.6.3.4). Despite mitigation efforts, some climate change is inevitable in the next few decades. Thus, Clause 6.3.2 focuses on the impacts of climate change on forests and how forests might be managed to adapt to the changes. There is limited knowledge of how forests will respond to a changing climate this century. However, it is known that forest conditions are tightly tied to the prevailing climate, and that the forest management decisions made today commit forest ecosystems to development trajectories that unfold over many decades. Climate change is already affecting forest productivity, water availability, and the rate and extent of forest disturbances such as fires and insect outbreaks. Therefore, it is important for organizations and interested parties to explore conceptually how climate change might help or hinder forest development in the DFA and what options are feasible to cope with undesirable impacts. The differences between active and passive strategies for coping

should be considered. For example, managers might consider actively addressing climate change through anticipatory planting (e.g., establishment of drought-resistant subspecies of trees) and maintenance of stands with multiple species and ages. The use of different seed sources and assisted migration to adapt stands to climate change are also important factors to be considered to maintain ecosystem resilience and productivity.

For those organizations that wish to pursue climate change vulnerability assessment and adaptation planning (VA-AP) in more detail, the Canadian Council of Forest Ministers (CCFM) has produced a set of background and guidance documents for this purpose.

Disturbances can be seen as both destructive and regenerative processes. For example, while an intense fire can kill whole stands of mature trees, it also can create favourable conditions for tree regeneration. Rapid and intense disturbances can therefore reduce some forest values (e.g., fire destroys valuable timber) and increase others (e.g., fire creates habitats favoured by early-successional species). While disturbances are a key driver of forest change, managers cannot usually predict where and when they will occur. Managers therefore need to engage in risk management. This includes actions such as

- reducing the vulnerability of forests to catastrophic disturbances;
- maintaining preparedness for appropriate responses when disturbances occur;
- managing human disturbances in such a way that they do not compromise ecosystem condition and productivity; and
- using fire only when necessary to achieve management goals, e.g. fuel reduction in high hazard areas.

A key contemporary issue in SFM in Canada is the use of forest biomass beyond conventional forest products. This issue has arisen largely in response to the desire for renewable energy sources. The organization and interested parties should examine the issue closely, with initial discussions focusing on the immediate uses of non-timber biomass (e.g., left on site, burned, removed for energy or other purposes). Subsequent discussions should examine future expectations for biomass use, with emphasis on the ecological and cultural impacts of such biomass removals. If the organization intends to remove biomass, it should develop clear operational guidelines for the sustainable removal of biomass from forest ecosystems.

Initiatives beyond the organization's control can also influence forest condition and ecosystem productivity. Examples include restrictive prescriptions imposed to meet species at risk requirements, area removed from the forest land base for the settlement of Aboriginal claims, or for other land uses such as highways or utility corridors.

A.6.3.2.3 Element 2.1 — Forest ecosystem condition and productivity

Note: *This commentary is related to Clause 6.3.2.3.*

SFM is predicated on the principle of maintaining forested landscapes. If forest cover is removed from a site, successful forest regeneration, including reforestation is to be achieved in a timely manner. One method to gauge the success of forest renewal is tracking the proportion of harvest area successfully regenerated within a specific period of time.

Reforestation success is more than simply regenerating a disturbed area to a forested area. The indicator should examine the proportion of stands regenerated to the preferred forest type (as outlined in the silvicultural prescription) versus those simply regenerated to an acceptable forest type. Harvested areas should be regenerated promptly using tree species ecologically suited to the site. A number of tools and guides are available to assist forest managers in choosing suitable tree species. Regenerating stands to the preferred forest type is crucial to achieving the desired future forest condition.

The core indicators from Element 1.1 (see Clause 6.3.1.3) are also relevant to maintain forest condition and productivity. Maintenance of the distribution of ecosystem types, forest types, and forest ages within the range of natural variation that can occur through time and across the DFA landscape helps to ensure that the DFA can withstand disturbance introduced by harvesting or other activities. Regeneration success should be estimated in the context of maintaining this range of natural variation.

A sustainably managed forest will also be better prepared for climate change. Organizations might want to discuss the role of proactive adaptation strategies, such as assisted migration and related genetic research, that would allow the introduction of tree populations that are better adapted to future conditions. Current research in British Columbia and other jurisdictions has developed protocols and standards guiding the expansion of current seed zones based on long-term provenance tests and climate modelling. Where similar information exists for the DFA, discussions on introducing new genetic material may be relevant.

Forest ecosystem productivity can be interpreted to mean both net primary production (NPP) and forest (i.e., wood) productivity. This element focuses on wood productivity or the production of wood biomass.

SFM should cover the extent of forest in a landscape, including encouraging additions to the forest ecosystems and discouraging deletions caused by humans. Such additions and deletions to the forest area should be tracked according to cause. It might be sufficient to track area changes to forest ecosystems according to a broad classification of causes (e.g., new infrastructure, industrial or residential development, impoundments or drainage works, agriculture, afforestation). There are circumstances where it can be inappropriate to foster additions to forest ecosystems. For example, the suppression of fires can lead to the in-growth of trees where they would not normally occur, and reduce the grassland and savannah conditions in western Canada.

For many people, sustainability involves limiting actual timber harvest to levels within the long-term capability of the forest to grow wood. To track this, managers need data on both harvest levels and long-term production capability to make proportional calculations. In practice, only the actual harvest level can be physically measured. The amount of wood that can be produced in perpetuity from a forest is a theoretical calculation that depends not only on the inherent wood-growing capacity of the forest ecosystem but also on the kinds and intensities of management inputs (e.g., silvicultural treatments). Because the latter inputs are under human control, a forest can have a wide range of potential long-term sustainable wood harvest levels. The organization and interested parties should develop a mutual understanding of how long-term sustainable harvest levels are to be calculated. The actual annual allowable harvest levels are determined or approved by each province using a range of analytical tools and consideration of socio-economic factors. These determinations are used by forest managers to ensure that harvest levels are sustainable over the long term.

As a precaution, managers might wish to ensure that, over time, wood harvest levels are maintained at or below the calculated long-term sustainable level. However, for a variety of reasons, it might be sensible to harvest above the long-term sustainable level for a few years. These include

- salvaging harvests as a result of insect infestations;
- attempting to accelerate changes in forest composition toward more natural states; and
- correcting undesirable age-class imbalances such as an over-abundance of declining stands caused by the suppression of natural disturbances. It should be recognized that all forest ages and conditions can deliver valuable ecological services.

A.6.3.3 Criterion 3 — Soil and water

Note: *This commentary is related to Clause 6.3.3.*

Soil is the foundation of forest ecosystems and the main source of nutrients for all plant species. Most of the fine roots of trees, which are responsible for nutrient uptake, exist in the top 20 cm of the soil. It is therefore vital to keep soil in place and to disturb it as little as possible. A common approach is the implementation of best management practices (BMPs), established on the basis of substantial field experience and targeted research. Soil-related BMPs address topics such as appropriate kinds of machine traffic on sensitive sites, appropriate seasons for field operations, and guidelines for the sustainable removal of biomass. Even with careful use of BMPs, some sites can suffer severe soil disturbance (e.g., due to machine operations). In such cases, managers might need to take actions to rehabilitate sites.

Fresh water is considered one of the most precious natural resources in the world today. Much of Canada's fresh water moves through forest ecosystems before entering rivers and streams, and is found in wetlands such as swamps, marshes, bogs, and similar areas. These wetlands and water bodies are not only key habitats for all aquatic organisms, but are often relied on as sources of domestic (potable) water.

Forest management activities, including infrastructure development (e.g., skid trails, roads, bridges), can have a profound influence on both soil and water quantity/quality. Forest managers should minimize any adverse impacts of these activities.

A.6.3.3.3 Element 3.1 — Soil quality and quantity

Note: *This commentary is related to Clause 6.3.3.3.*

Maintaining soil quality and quantity involves implementing management strategies to minimize and mitigate soil disturbance. Measuring soil conditions, particularly chemical and physical properties, might be feasible at a specific site, but impractical across entire working forests. Established research may be used to identify the links between certain kinds of soil-related forest practices and soil conditions, and forest managers can control their practices accordingly. When monitoring operations such as harvesting and infrastructure construction (roads, bridges, landings, etc.) reveal that soil disturbances (e.g., erosion, rutting, displacement, slumping) exceed locally defined threshold levels, appropriate mitigation efforts should be implemented.

Dead wood is an important component of a healthy forest ecosystem. While live trees can be blown down and die, often trees die standing. These standing dead trees, or snags, serve as important habitats for a wide range of decomposing organisms, as well as cavity-nesting species such as woodpeckers. Coarse woody material includes both downed woody material and standing trees that have been left to allow the woody material to decompose, resulting in organic matter that eventually becomes part of the soil. Downed woody material can be managed by leaving both dead and live trees, as well as downed logs, whenever timber is harvested.

A.6.3.3.4 Element 3.2 — Water quality and quantity

Note: *This commentary is related to Clause 6.3.3.4.*

It is important to understand the risk to water quality and quantity associated with stand-replacing disturbances (human and natural-caused) in a defined watershed or broad water-management area. The effects due to disturbances are normally highest in the initial post-disturbance years and diminish over time as regenerating forest cover is established. The critical threshold at which the disturbance begins to affect water values varies according to a number of factors, including topography, soil properties, vegetation types, and climate. When the extent of the disturbed area approaches threshold

levels, appropriate mitigation strategies are necessary. This is particularly important in watersheds such as those used for potable water.

Forest ecosystem conditions at the watershed level can have a strong influence on water quality and quantity in rivers, lakes, and wetland systems. Forest ecosystems subject to stand-replacing disturbances such as fire, windthrow, or clear-cutting can temporarily lose their ability to moderate water flows associated with large rainfalls and snowfalls. These water flows include both overland flow and the sub-surface flows associated with groundwater recharge and discharge. To maintain water quality and quantity forest managers may need to restrict, to the degree possible, the proportion of a watershed's forest that has recently experienced stand-replacing disturbances. This also helps ensure that peak flow thresholds are not exceeded due to management actions. The expected increase in the intensity and frequency of hydrological events due to climate change may alter the historical condition of water bodies and features in a forest management area which could affect water quality and quantity in the watershed.

Wetlands are a component of forest ecosystems and play a pivotal role in regulating local and regional forest hydrology and serving as both a source and sink for water and nutrients.

The appropriate scale for measuring the proportion of a watershed's forests that has been recently disturbed differs according to region and conditions. If the order or size of watershed used is too large, disturbance effects will be unmeasurable or diminished by scale. Similarly, if the watershed order or size is too small, the effect of the disturbance will be exaggerated inappropriately by the scale. Watershed features such as slope or soil texture vary, as does the length of time for stands to recover, and these also affect the impact of disturbance on water flows. Engaging experts who are familiar with local or regional conditions is important when defining the appropriate size of watershed or water management area, critical thresholds, and appropriate mitigation strategies.

Because an organization has little control over natural disturbances, it might be appropriate to distinguish between natural disturbances and the subsequent forest operations when reporting on the proportion of recent disturbances in a watershed.

There are many aspects of forest management activities including infrastructure construction (roads, bridges, landings, etc.) that may affect water quality and quantity and each of these activities may have immediate or long-term effects. Direct measurements of water quality and quantity are largely unfeasible across entire working forests. Established research on the effects of certain field practices on local water quality and flows have been used to establish regulations and guidelines to control field practices. These regulations and guidelines address such topics as fish habitat, stream crossings, and riparian areas. Forest planning and operational strategies may be guided by best management practices to minimize and mitigate impacts to water quality and quantity. Having detailed maps of surface water and wetland systems can help identify areas within a management area where certain planning, avoidance and mitigation strategies might be required.

A.6.3.4 Criterion 4 — Role in global ecological cycles

Note: *This commentary is related to Clause 6.3.4.*

Machine operations generate emissions of carbon dioxide and other compounds that contribute to climate change. Thus, the lower that forest managers can make these emissions during forest operations, the better for the environment.

A.6.3.4.3 Element 4.1 — Carbon uptake and storage

Note: *This commentary is related to Clause 6.3.4.3.*

Forests and associated ecosystems, such as wetlands, have great potential to sequester and store carbon from the atmosphere. Given the importance today and in the future of the carbon-storage potential of forests, managers should recognize the imperative of keeping forest lands in vigorous tree growth at all times. This includes ensuring prompt tree regeneration following disturbances such as timber harvests. It also includes converting the smallest possible amount of forest land to non-forest land during forest operations (e.g., minimizing roads and landings). Where possible and ecologically suitable, it can also mean converting non-forest land to forest land by establishing trees — a process known as afforestation. A common example of afforestation is planting trees on abandoned farm fields.

Forest carbon has become a key SFM value, especially in light of Canada's international commitment to lower its net carbon outputs to the atmosphere. Models for calculating a forest carbon budget (e.g., the Canadian Forest Service's Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3)) have become widely available and are readily linked to models commonly used for forecasting forest structures and potential wood supplies. Their use in forest planning can indicate whether a specific forest is expected to be a net carbon source or sink over the period normally used for wood-supply forecasts. In some cases, it can be advisable for the organization to look beyond the DFA and identify the carbon budget using existing data calculated over a broader scale (e.g., from provincial government initiatives devoted to calculating forest carbon budgets).

Two important considerations for determining the scope of carbon-budget analysis are

- whether the fate of timber harvested from the DFA is tracked as part of carbon-budget modelling; and
- whether and how carbon emissions from forest operations are tracked.

A.6.3.4.4 Element 4.2 — Forest land conversion

Note: *This commentary is related to Clause 6.3.4.4.*

Notwithstanding the special circumstances in which forests might not be naturally occurring ecosystems (see Clause A.6.3.2.3), it is good for the global carbon cycle to have land in forest cover across its natural range. Forests can be turned into other types of ecosystems through a variety of activities, including those that relate directly to SFM (e.g., building roads and landings) and those outside the influence of forest managers (e.g., urban and industrial developments, utility corridors). Forest managers should reduce, as much as possible, the amount of area they convert to non-forest ecosystems and should discourage unwarranted forest land conversions that are beyond their control.

In Canada's natural forest, post-harvest regeneration is often accomplished by the planting of site-adapted species of native trees and results in a stand with ecological characteristics consistent with those of the surrounding forest. Planted stands are managed for multiple values and almost always include a considerable component of naturally regenerated trees of a variety of species. Forest plantations in the Canadian context are rare, and are often established through afforestation of unused marginal agricultural land.

A.6.3.5 Criterion 5 — Economic and social benefits

A.6.3.5.3 Element 5.1 — Timber and non-timber benefits

Note: *This commentary is related to Clause 6.3.5.3.*

During the development of forest management plans, it is important to consider a variety of social and

ecological benefits produced in the DFA. The uses and benefits considered should include, but not be restricted to, the following timber and non-timber resources:

- outdoor activities;
- timber and forest cover;
- hunting, fishing, and trapping activities;
- ecotourism;
- cultural and heritage resources;
- ecological goods and services, and
- other non-timber forest products.

In the rare instance where the organization has the authority for the harvest of non-timber forest products, the organization should ensure that harvesting is done in a sustainable manner.

A.6.3.5.4 Element 5.2 — Communities and sustainability

Note: *This commentary is related to Clause 6.3.5.4.*

Economically and socially diverse communities, including Aboriginal communities, are more sustainable.

While an organization is not expected to financially support community diversity, it should support efforts to increase diversity and avoid preventing the establishment of other enterprises. Co-operation with other forest-dependent businesses and forest users might include initiatives such as coordinating the timing of activities to accommodate multiple uses, and making resource information available to other users.

Forests represent not only a return on investment (measured in monetary and non-monetary terms) but also a source of various benefits for DFA-related workers, contractors, and others; stability and opportunities for communities; and revenue for local, provincial, and federal governments. Through the public participation process and the implementation of SFM, the organization should address:

- communities and sustainability, including
 - diversification of opportunities, especially for members of underrepresented groups (e.g. Aboriginal People, women, visible minorities, youth);
 - investment in the community and its facilities, for example through educational opportunities to provide youth with skills necessary to join the workforce, partnerships or philanthropic activities; and
 - opportunities for direct and indirect employment both in the DFA and within the community; and
- fair distribution of benefits and costs, including
 - fair and reasonable wages for DFA-related workers, as established by prevailing industry collective agreements or market rates;
 - fair return on investment to the organization and to DFA contractors;
 - local taxation as determined by applicable assessment and appeal procedures; and
 - revenues to the Crown and other land owners as determined by applicable stumpage or market rates.

A.6.3.6 Criterion 6 — Society's responsibility

A.6.3.6.2 Element 6.1 — Fair and effective decision-making

Note: *This commentary is related to Clause 6.3.6.2.*

A mechanism such as a survey may be used to determine participant satisfaction with the public participation process, particularly when participants understand that consensus-based decision-making is used to incorporate all interests. The ability of people to share information, discuss and solve problems, and set and meet objectives is key to achieving and maintaining meaningful participation.

Many types of initiatives (e.g., two-way information exchanges, educational opportunities) can be used to help promote meaningful participation.

Information on issues of public concern, as well as educational opportunities, should be made available to public advisory groups, Aboriginal Peoples, and the public in general. The sharing of learnings and opinions contributes to balanced, more acceptable plans and decisions.

A.6.3.6.3 Element 6.2 — Safety

Note: *This commentary is related to Clause 6.3.6.3.*

The organization integrates safety as an over-riding priority into all its day-to-day operations and workers are encouraged to take shared responsibility for their safety, the safety of their co-workers, and the safety of the public that they may interact with. Workers commitment to safety should be encouraged and recognized, enabling them to raise concerns with co-workers and employers without reprimand.

A.6.3.7 Criterion 7 — Aboriginal relations

A.6.3.7.2 Element 7.1 — Aboriginal and treaty rights

Note: *This commentary is related to Clause 6.3.7.2.*

Aboriginal Peoples in Canada have unique rights and ownership related to lands and resources. Meaningful relationships with Aboriginal Peoples require engagement and consultation regarding forest management decisions and incorporation of Aboriginal values into forest management.

Section 35 of the *Constitution Act* states “The existing Aboriginal and treaty rights of Aboriginal Peoples of Canada are hereby recognized and affirmed”. Some examples of the rights that Section 35 has been found to protect include hunting, fishing, trapping, gathering, sacred and spiritual practices, and title. SFM requirements are not in any way intended to define, limit, interpret, or prejudice ongoing or future discussions and negotiations regarding these legal rights and do not stipulate how to deal with Aboriginal title and rights, and treaty rights.

The foundation for healthy Aboriginal relationships is based on respecting Aboriginal title and rights while promoting a consensus based process for forest management decision making.

A consensus based process is understood to mean, striving for decision making based on consent from First Nations, where the aim is to come up with proposals that work for everyone, and everyone’s input is heard and considered.

This Standard reinforces current legal requirements for many reasons, including the reality that demonstrating respect for Aboriginal title and rights, and treaty rights can be challenging in Canada’s evolving legislative landscape and therefore it is important to identify these legal requirements as a starting point. For example, the June 2014 Supreme Court of Canada decision regarding Tsilhqot’in Nation in British Columbia resulted in a unanimous decision granting title to almost 50% of the Tsilhqot’in Nations traditional territory. The impacts of this decision are providing increased definition of title and how it may be established and leads towards a deeper level of consultation over Aboriginal rights that directs us towards consent based decision making.

This Standard goes beyond current legal compliance and includes other methods of respecting Aboriginal title and rights, such as

- making efforts to understand Aboriginal rights;
- seeking acceptance of forest management plans on the basis of Aboriginal communities having a clear understanding of the plans;

- identification of and respect for Aboriginal forest values and uses;
- recognition of Aboriginal Peoples' expertise;
- use of Aboriginal knowledge; and
- development of meaningful and effective working relationships with Aboriginal Peoples, which are integral components of involving Aboriginal communities and facilitating acceptance of forest management plans.

It is important for the organization to have an understanding of applicable Aboriginal title and rights, and treaty rights, as well as the Aboriginal interests that relate to the DFA. Engagement with Aboriginal Peoples and communities, through individuals and community representatives and leaders, results in contributions towards specific management and operating plans as well as supporting meaningful relationships with leadership. This all contributes towards shared decision making.

The organization should also be aware that the Aboriginal interests or rights of one group (community or Nation) can be different than those of another. Several organizations that have applied this Standard have benefited from cross-cultural training and shared community experiences with Aboriginal Peoples.

A.6.3.7.3 Element 7.2 — Respect for Aboriginal forest values, knowledge, and uses

Note: *This commentary is related to 6.3.7.3.*

Organizations are also required to make special efforts to obtain Aboriginal participation (see Clause 5.2). A meaningful relationship might include

- a process for engagement and information exchange that already exists or is jointly developed between the organization and Aboriginal individuals or communities;
- encouragement of other organizations (such as governmental agencies) to provide capacity and participation opportunities for Aboriginal communities;
- the use of Aboriginal knowledge in planning and management of forest lands and resources, while supporting and assisting in the protection of this knowledge;
- encouraging willing Aboriginal communities to identify important cultural resources, sites, and values for incorporation in management planning and operational prescriptions;
- planning based on the mutually agreeable incorporation of values and management of sites and values;
- the tracking and fulfillment of agreements and commitments made between the organization and Aboriginal communities; and
- Understanding the importance of Aboriginal forestry businesses (both timber and non-timber resources) to the communities and the opportunities inherent to all parties from the development of business relationships.

Agreements based on information sharing and engagement should encourage the dissemination and use of information, respect confidentiality, and specify the parameters for the release of information. In order to address the issues regarding the sharing of confidential and sensitive information from Aboriginal communities, organizations are encouraged to develop information-sharing agreements, such as partnership agreements and memoranda of understanding that outline ways to protect this information.

It is recognized that the evidence of understanding and the level of support by companies varies across the country due to the large variety of opportunities, circumstances, and interest amongst Aboriginal communities. The expectation is that all companies will reach out in a manner that indicates an evolving level of effort and innovative approaches to involvement that are respectful of the local Aboriginal communities wishes.

In order to effectively incorporate Aboriginal rights and interests into SFM plans, a process should be established to identify, address, and protect Aboriginal rights, uses, cultural resources, and values. Examples of management and protection activities might include management and/or protection of riparian areas and wetlands or establishment of wildlife corridors.

A.7 SFM system requirements

A.7.1 General

Note: *This commentary is related to Clause 7.1.*

SFM system requirements are intended to ensure that an infrastructure (including resources, processes, and controls) that enables an organization to deliver on the overall goal of SFM in the DFA is established and maintained. System requirements are the delivery mechanism of SFM.

The organization is required to establish SFM values, objectives, indicators, and targets for all SFM elements (see Clause 6.3) and develop an SFM plan that describes the methods by which the targets are to be achieved in the DFA. The organization needs to put in place the resources, processes, and controls necessary to ensure successful implementation of the SFM plan. Progress can be assessed by the regular measurement and assessment of performance against the SFM requirements, including the effects on the forest. Through monitoring, measurement, and management review, the organization can report on its progress and demonstrate that corrective actions are taken in the event of any unplanned variances.

A.7.2 SFM policy

Note: *This commentary is related to Clause 7.2.*

The ongoing commitment and leadership of top management are crucial. An early step in developing or improving an SFM system is obtaining a commitment to the SFM system from the top management of the organization that is responsible for managing the DFA. The responsibility for setting and approving the SFM policy normally rests with the organization's top management, while other levels of management might be responsible for implementing policy and suggesting modifications.

An SFM policy establishes an overall sense of direction for the sustainable management of the DFA and sets out the principles of action for an organization. It also establishes the level of responsibility and performance required of the organization, against which all subsequent actions will be measured. The SFM policy statement is the yardstick for the organization managing the DFA. Therefore, there is a requirement for the policy to be documented, communicated both internally and externally, and readily available to any interested party.

The SFM policy statement should be reviewed periodically as part of the continual improvement process and modified, where appropriate, to reflect changing circumstances and the results of implementing the SFM requirements.

International agreements and conventions to which Canada is signatory include agreements issued by the International Labour Organization, *Convention on Biological Diversity*, and others.

A.7.3 Planning

A.7.3.1 Defined forest area

Note: *This commentary is related to Clause 7.3.1.*

One of the first steps in meeting the SFM requirements is to establish the geographical boundaries of the DFA to be managed under the SFM requirements. The DFA may be privately or publicly owned land, or a combination of both.

The SFM requirements are to be addressed for the entire DFA. This is a primary consideration in determining the extent of the DFA and the organizations or individuals needed to meet the SFM requirements. There is no specified minimum or maximum size for a DFA: it can range from a few hectares to more than a million hectares, and can be a combination of smaller units or even a combination of non-contiguous operating areas. The DFA may consist of one or more analysis units used to determine objectives, indicators, and targets for each SFM element.

In the case of non-contiguous or overlapping areas, all parties needed to address the SFM elements for the DFA should consider the issues associated with isolated parcels and common areas within the overall plan for sustainability of the DFA (see Clause 7.3.2).

Changes to the geographic extent of the DFA may be made over time without affecting certification, provided that the impacts of the changes are insignificant. Changes to a DFA can result from a variety of circumstances. For example, under volume-based tenure, the operating areas of the organizations that make up the applicant can vary from year to year, and this can influence the geographic extent of the DFA. In this case, historical operating areas of volume-based tenures may be included in the DFA. Where owners or managers of small, non-contiguous parcels of land come together to form the applicant, the addition of new areas to the DFA or the deletion of existing areas from the DFA may occur according to the interests of participants. Even in cases of area-based tenure, factors can arise that result in modifications to the boundaries of a DFA. In all cases, these changes should be documented. Slight changes to a DFA, with no apparent impact on values, objectives, indicators, and targets, might not require changes to the methods of meeting the SFM requirements of the SFM plan.

The organization can be subject to a range of rights and responsibilities related to its operations in the DFA, depending on the pattern of land ownership and the types of activities that are carried out in the DFA. These rights and responsibilities will generally be set out in agreements between the landowner (e.g., the government in the case of public lands) and the organization. There can be other parties in the DFA in addition to the applicant, but whose legal rights and responsibilities are respected by the organization. These rights and responsibilities, which include all the existing legislative and policy responsibilities assumed and executed by various government agencies, should be documented.

A.7.3.2 Defined responsibilities

Note: *This commentary is related to Clause 7.3.2.*

Certification is specific to the DFA to which the SFM requirements are applied. Any combination of owners and managers can make up the applicant, and any combination of public land and private land can make up a DFA, provided that the SFM requirements of this Standard can be met.

Depending on the pattern of land ownership and the nature of the relationship between governments and licensees or users on public land, there will likely be shared responsibilities for managing forest values in a DFA. These responsibilities should be defined. Where responsibilities related to any of the SFM elements are shared among organizations or individuals, it might be necessary to consider these

organizations for inclusion as part of the applicant. An open invitation to participate in meeting the SFM requirements should be provided to those with management responsibilities.

There can be individuals or organizations, in the forest sector or other resource sectors (e.g., mineral or oil/gas) and operating inside or outside the boundaries of the DFA, whose activities can have a significant impact on the ability of the organization to achieve SFM targets within the DFA. Such individuals or organizations should be invited to participate in the process. If they are not interested in participating or are not necessary for the achievement of the SFM elements, the organization may proceed without their involvement provided that the objectives and targets can still be achieved. The organization should try to anticipate the impacts of these actions in the development of SFM targets, and to co-operate with such individuals or organizations to minimize potential negative impacts.

Attempts made to include other organizations, as well as the reasons given for their participation or non-participation, should be documented.

The role of government

Many DFAs in Canada are situated on public land where governments are responsible for the forest values specified in the SFM elements; however, participation in meeting the SFM requirements cannot be made mandatory. This Standard is voluntary and non-regulatory, and meeting the SFM requirements is not dependent on government involvement.

Volume-based tenure

SFM requirements are intended to achieve performance targets in a DFA, and their implementation requires a significant level of co-operation among organizations operating on volume-based tenures. In such circumstances, individual organizations are unlikely to have sufficient responsibility and control to ensure that all SFM elements are addressed in the DFA. Organizations that operate on a volume-based tenure should determine the extent of their responsibilities related to implementing the SFM requirements in the DFA and identify the responsibilities of other organizations operating in the same area. Each organization within the DFA may have its own “corporate personality” in the form of vision, mission, policy statements, and operating procedures, provided that they meet the requirements of this Standard. All organizations seeking or maintaining certification under this Standard within the DFA, however, should agree to the same SFM targets for the DFA and should have the resources, processes, and controls in place to ensure that they are met.

Because the implementation of the SFM requirements is voluntary and non-regulatory, there might be cases where individuals or organizations with management responsibilities are not interested in participating or not necessary for the achievement of SFM elements. This does not preclude successful certification to this Standard for the individuals or organizations that are interested in proceeding; it is not necessary for all individuals or organizations with management responsibility to be involved, provided that the operations of those parties not participating do not prevent the applicant from meeting its SFM targets in the DFA.

A.7.3.3 Rights and regulations

Note: *This commentary is related to Clause 7.3.3.*

Rights and tenure within the DFA

Property rights and land tenure arrangements will be clearly defined and documented for the relevant forest area. In addition, legal and traditional rights related to the forest land are to be clarified, recognized, and respected.

The organization can be subject to a range of rights and responsibilities, in addition to Aboriginal title and rights, and treaty rights, related to its operations in the DFA and in accordance with the pattern of land ownership and the types of activities carried out in the DFA. These rights and responsibilities are generally set out in agreements between the landowner (e.g., the government in the case of public lands) and the organization. There can be other parties in the DFA that are not part of the applicant but whose legal rights and responsibilities should be respected by the organization. These rights include

- guide outfitters licences/certificates;
- angling guide licences;
- registered traplines and trapping licences;
- easements and covenants;
- public and private rights-of-way;
- statutory tenures (e.g., licences, permits), including mineral exploration and development;
- customarily or legally permitted uses of public land for gathering of non-timber forest products, hunting, fishing, etc.;
- rights or obligations related to construction, rehabilitation, or maintenance of trails or other recreation facilities;
- rights to use public footpaths or roads (e.g., access to well-known landmarks, features, or viewpoints);
- water-use rights and obligations (licensed and unlicensed); and
- common law rights of riparian owners.

Such rights and responsibilities should be documented. They include all the existing legislative and policy responsibilities assumed and executed by various government agencies.

Legal requirements within DFA

The organization should establish and maintain a list of all legal requirements pertaining to the DFA. The organization is able to demonstrate that it is aware of legal requirements and has a system to ensure legal compliance. Specific legal requirements can be related to various aspects of the organization's forestry activity, including

- the activity (e.g., road construction, resource management, authorizations, licences and permits);
- the organization's products or services; and
- monitoring, measurement, and reporting.

Some issues that should be considered (for legal and other requirements) are the organization's access to and identification of relevant requirements, tracking changes to requirements, and communication of relevant information on requirements to personnel, contractors, and subcontractors.

Several sources can be used to identify legal requirements and ongoing changes, including company legal departments, all levels of government, industry associations or groups, commercial databases, and professional services.

Complying with government-specified requirements alone may not be sufficient to demonstrate SFM on a DFA. SFM plan targets may exceed government requirements in certain circumstances.

Rights of workers to organize

The right of DFA-related workers to organize and participate in collective bargaining are respected, including full recognition of unions and their representatives. The organization should refrain from interference in legitimate union activities and organizing efforts.

DFA-related workers should have access to training and awareness programs related to SFM.

Note: See also Elements 6.1 (Clause 6.3.6.2) and 6.2 (Clause 6.3.6.3).

Rights of private woodlot owners and landowners

The values of private woodlot owners should be addressed in the context of important public values. Private woodlot owners have acquired rights and responsibilities, which are recognized by this Standard. While all SFM requirements apply regardless of ownership, this Standard recognizes that private landowners have the right to decide the objectives for their land and limit public access for certain activities.

A.7.3.4 Incorporation of public participation requirements

Note: This commentary is related to Clause 7.3.4.

For an explanation of public and Aboriginal participation requirements, see Clause 5 and Clause 7.3.4.

A.7.3.5 SFM plan

Note: See Clause 7.3.5.

An SFM plan will be developed for each DFA. SFM plans should cover a 20- to 25-year period and should be revised as necessary. The SFM plan is the principal vehicle for transforming the organization's commitments to SFM into actual actions in the forest. The SFM plan summarizes the current state of the DFA as well as the values, objectives, indicators, and targets of SFM developed through the public and Aboriginal participation process. The organization should consider the inclusion of a brief summary of the organization's operating environment, including the SFM plan linkages to higher level plans and other regulatory requirements. Such a summary would provide the public and Aboriginal participation process and third parties with an understanding of the organization's planning and practices that goes beyond the information provided in the SFM plan or in a matrix of values, objectives, indicators, and targets developed through a public participation process. In the event that approved forest management plans and associated reports exist to satisfy regulatory requirements, the SFM plan may refer to these documents to satisfy the requirements of this Standard.

Organizations should ensure that the SFM plan not only contains the right information but also presents the information in a way that makes it readily understandable to interested parties. The complicated technical components of the planning process should be explained in terms of their essential components and implications. Organizations are encouraged to explore alternative forms of communication for SFM plans, including customary print-based media as well as digital options (e.g., websites, compact discs, and videos).

Because of the extended time frame of an SFM plan, specific details about what is to be accomplished in any given year might not be included. As a result, short-term plans may be developed. Short-term plans should clearly demonstrate how planned activities lead to the achievement of the SFM targets. One method is to include benchmarks, which represent intermediate milestones along the way to achieving a target.

A.7.4 Implementation and operation

A.7.4.1 Structure, responsibility, and resources

Note: This commentary is related to Clause 7.4.1.

The capabilities and support required by an organization constantly evolve in response to changing requirements. To fulfill its SFM requirements, an organization should focus and align its people, systems, strategies, resources, and structure. The human resources, physical resources (e.g., facilities

and equipment), and financial resources required to meet the SFM requirements (including the fulfillment of SFM targets) are to be defined and made available to all levels of the organization. The allocation of sufficient resources to ensure the success of the SFM system is a measure of the organization's commitment.

The organizations and individuals responsible for the implementation of each aspect of the SFM requirements are to be identified. General and specific responsibilities, authority, and accountability should be assigned to all persons whose activities influence the SFM requirements.

A.7.4.2 Competence, training, and knowledge

Note: *This commentary is related to Clause 7.4.2.*

Top management has a key role to play in building awareness and motivating personnel by explaining the organization's commitment to SFM and communicating its commitment through the SFM policy. It is the actions of individual personnel, however, that transform the SFM requirements into an effective process, leading to satisfactory on-site performance.

All personnel and contractors are aware of the SFM requirements and how they are being met. Personnel and contractors should be provided with opportunities to include their input in the ongoing review of the SFM requirements. Motivation for continual improvement is enhanced when personnel and contractors are recognized for achieving SFM targets and encouraged to make suggestions that can lead to improved SFM.

The knowledge and skills necessary to achieve SFM should be identified. These should be considered in training, skills development, and ongoing education. Appropriate training should be provided to all personnel within the organization and to relevant contractors. Personnel and contractors will have sound knowledge of the methods and skills required to perform their tasks, and should be aware of the impact of their activities on SFM. Education and training are needed to ensure that personnel and contractors have appropriate and current knowledge of regulatory requirements, internal standards, and the organization's policies and targets. The level of training will vary according to the task.

Training programs typically include

- identification of qualification requirements for personnel and tasks;
- identification of personnel and contractor training needs;
- development of a training plan to address defined needs;
- verification of conformance of the training program to regulatory or organizational requirements;
- training of target personnel/contractor groups;
- documentation of training received; and
- evaluation of training received.

As a means to achieve continual improvement, the organization is required to monitor advances in SFM science and technology and incorporate them where and when applicable. The organization should also be engaged in the acquisition of knowledge about the DFA and SFM. This can be achieved through such activities as inventory data collection, gathering of conventional knowledge, and involvement in research.

A.7.4.3 Communication

Note: *This commentary is related to Clause 7.4.3.*

The following communication and reporting issues should be considered:

- What is the process for communicating with DFA-related workers and contractors?
- What is the process for communicating with external interested parties?

- What is the process for communicating the organization's SFM policy and performance?
- How are the results from internal and external audits communicated to all appropriate people in the organization?
- What is the process for making the SFM policy available to the public?
- Is internal communication adequate to support continual improvement of the SFM?

Communication includes establishing processes to report internally and, where desired, externally on the SFM activities of the organization in order to

- demonstrate commitment to the SFM requirements;
- deal with internal concerns and questions about the SFM requirements;
- raise awareness of the public and Aboriginal participation process and the organization's SFM policy and plan (see Clause A.7.3.5 for information on the contents of the SFM plan); and
- inform interested parties about the organization's progress in fulfilling the SFM requirements as appropriate and as required by this Standard.

Results from monitoring, measurement, performance checks, audits, and management reviews should be communicated to those within the organization who are responsible for delivering and managing these functions. In addition, the organization will likely need to develop a number of internal reports and schedules as part of the SFM requirements.

A.7.4.4 SFM documentation

Note: *This commentary is related to Clause 7.4.4.*

The primary purpose of SFM documentation is to describe the methods of fulfilling the SFM requirements. Documentation also enables the evaluation of an organization's progress towards SFM. Effective documentation encourages awareness on the part of personnel and contractors of the requirements of the SFM plan. The nature of the documentation can vary depending on the size and complexity of the DFA and the organization(s) implementing the SFM requirements. Where SFM requirements are integrated with an organization's overall management systems, the SFM documentation may be integrated into existing documentation.

SFM system manual

Organizations may consider developing an SFM system manual to describe the methods of fulfilling each of the SFM requirements. Such a document would serve as a reference for the implementation and maintenance of the SFM requirements. The SFM system manual is different from the SFM plan, which focuses on performance requirements.

Documentation issues

The following documentation issues should be considered:

- How are documents and procedures identified, documented, communicated, and revised?
- Does the organization have a process for developing and maintaining documentation?
- How is SFM documentation integrated with existing documentation, where appropriate?
- How do personnel and contractors access the relevant documentation needed to fulfill their responsibilities and perform their job activities?

A.7.4.5 Document control

Note: *This commentary is related to Clause 7.4.5.*

The purpose of documentation control is to ensure that the organization creates and maintains documents in a manner that is adequate to fulfill the requirements of this Standard.

A.7.4.6 Operational procedures and control

Note: *This commentary is related to Clause 7.4.6.*

Implementation of the SFM requirements and the SFM plan is accomplished through the establishment and maintenance of operational procedures and controls. These are often referred to as best management practices, work instructions, standard operating procedures, etc. Such operational controls are designed to ensure that activities or tasks are completed in a systematic way with desired outcomes. Operational controls also increase the probability that legal requirements are met and allow for targeted training of new personnel and contractors. Operational controls should be detailed and specific and should focus on operational specifications and thresholds that are easily and clearly understood by DFA-related workers.

When the applicant comprises more than one organization, various operational procedures and controls may be used, provided that they enable each organization to meet the requirements of the SFM plan.

A.7.4.7 Emergency preparedness and response

Note: *This commentary is related to Clause 7.4.7.*

Emergency plans and procedures are established to ensure that there will be an appropriate response to unexpected environmental emergencies or accidents. The organization should define the types of emergencies that could occur in the DFA and maintain appropriate response procedures. Emergencies may include fire and spills of hazardous material onto land or into water. Contingency plans should be developed for forest disturbances such as insect and disease outbreaks and blowdown.

Emergency procedures should take into account incidents arising, or likely to arise, as a consequence of both normal operating conditions and abnormal or unique operating conditions.

Emergency plans may include

- a list of types of emergencies;
- identification of emergency organizations and responsibilities;
- a list of key personnel and their contact information;
- details of emergency services (e.g., fire control and spill management services);
- internal and external communication plans;
- actions taken in the event of different types of emergencies;
- information on hazardous materials, including each material's potential impact on the environment and measures to be taken in the event of accidental release;
- provisions for clean up and remediation as necessary; and
- emergency response training plans and testing exercises.

A.7.5 Checking and corrective action

A.7.5.1 Monitoring and measurement

Note: *This commentary is related to Clause 7.5.1.*

A true measure of success in implementing the SFM requirements is comparing the indicator conditions that evolve over time with those that were forecast, and then assessing the acceptability of any variances. The periodic assessment of indicator conditions is key in determining if values are being sustained and SFM targets are being achieved. This includes assessment of actual changes in the forest. Understanding the reasons for variances between the actual and forecast results is essential to continual improvement. Management strategies should be adapted accordingly.

Assessing values, objectives, indicators, and targets

SFM is always a work in progress. At each stage of SFM planning, the values, objectives, indicators, and targets should be examined for continuing quality and validity. Values and objectives can lose their validity as public expectations change. Through monitoring experience, some indicators might be deemed less useful and others more so. Management experience might show that previous targets were either easily met (resulting in more rigorous objectives) or impossible to meet (necessitating more realistic goals). Overall assessment of the quality and meaningfulness of the values, objectives, non-core indicators, and targets for the DFA should be carried out at the beginning of each major round of SFM planning, with full engagement of interested parties in accordance with requirements for public and Aboriginal participation.

Assessing SFM performance requirements

Indicators should be compared against targets (or short-term benchmarks) according to a defined schedule. Unacceptable variances from any target should be identified, and the reasons determined and explained. Such variances can be caused by

- failure to implement fully the activities specified in the SFM plan;
- deficiencies in the information available when setting targets, leading to false assumptions about the feasibility of their achievement;
- poor choice of indicators; or
- factors beyond the control of the organization. An analysis of variances allows the organization to determine whether progress towards stated objectives is being made.

Assessing the SFM system requirements

Because the SFM system requirements are the delivery mechanism for the overall SFM performance, the effectiveness of the SFM system should be assessed regularly and improved as necessary. This is usually achieved through internal monitoring and corrective action processes.

Legal compliance

Compliance with legal requirements is a critical part of the SFM requirements. The key steps to ensuring legal compliance include

- obtaining a thorough knowledge of applicable legal requirements;
- ensuring that all legal requirements are met; and
- taking the necessary and appropriate corrective actions if a legal requirement is not met.

A.7.5.2 Corrective action

Note: *This commentary is related to Clause 7.5.2.*

The organization should implement and record any changes in the documented procedures resulting from corrective action. The findings, conclusions, and recommendations reached as a result of observation, measuring, monitoring, audits, and other reviews of the SFM requirements should be documented, and the necessary corrective actions identified. Management should ensure that these corrective actions are implemented and that there is systematic follow-up to ensure their completion and effectiveness.

A.7.5.3 Records

Note: *This commentary is related to Clause 7.5.3.*

Records are evidence of the ongoing maintenance of the SFM requirements and the progress towards targets. The number and types of records will vary greatly among DFAs and organizations. Records include all the documents necessary to demonstrate conformance with the SFM requirements, including

documentation of the public and Aboriginal participation process, the SFM performance requirements, and the SFM system requirements.

To fulfill the SFM requirements, the organization maintains a range of records and information. Effective management of records is essential to the successful implementation and maintenance of the SFM requirements. Documentation procedures should include

- identification;
- collection;
- indexing;
- filing;
- storage;
- maintenance;
- retrieval;
- retention; and
- disposition.

A.7.6 Management review

Note: *This commentary is related to Clause 7.6.*

An organization will review its performance in meeting the SFM requirements and continually improve its progress in achieving SFM. The organization's top management should, at appropriate intervals, conduct a complete and thorough review. The review should be broad enough in scope to address all dimensions of the SFM requirements and the DFA (see Clause A.6) and should cover the following:

- the public and Aboriginal participation process;
- the values, objectives, indicators, targets, strategies, and forecasts;
- performance in relation to targets;
- changes in the forest in relation to forecasts;
- findings of monitoring and audits (internal and external);
- corrective actions;
- the SFM policy and the need for changes;
- changing legislation or other relevant requirements;
- changing expectations, requirements, or responsibilities of interested parties;
- changes in types of forest operations or forest activities;
- changes in the organization or in resource requirements and availability;
- advances in science and technology;
- lessons learned from experience; and
- changes in the DFA.

A.7.7 Group certification requirements

A.7.7.1 Basic requirements

Note: *This commentary is related to Clause 7.7.1.*

Group certification is an alternative approach to forest certification which allows forest managers or owners to voluntarily certify public or private forest land under a single certificate. It may be used for contiguous or non-contiguous forest management units, or where more than one forest manager shares the same forest management unit, for example individually held tenure licenses on a single management unit of public land identified as the DFA. It allows a number of forest managers to share the financial obligations arising from forest certification as well as the common responsibility for forest management. An initial basic requirement of group certification is identification of all members of the group.

A.7.7.2 Group entity responsibilities

Note: *This commentary is related to Clause 7.7.2.*

In order to realize the synergies of group certification a group entity is selected and identified to represent the group. The group entity could be one or more members of the group, or could be an independent organization or individual engaged for the purpose of representing the group. The group entity is responsible for providing a commitment on behalf of the group to meet the requirements of this Standard, for establishing procedures for management of the group, for representing the group in communication with the certification body and for ensuring that conformance of the group participants with the requirements of this Standard is regularly monitored. Other responsibilities of the group entity include recording keeping and providing information and guidance to group members relevant to their responsibilities and tasks.

A.7.7.3 Group participant responsibilities

Note: *This commentary is related to Clause 7.7.3.*

A group participant can be an individual or a corporation, either a forest manager or owner who has the legal right and ability to manage a portion of the forest area identified as the DFA for the purpose of certification to this Standard. Group participation is voluntary. If a member chooses to leave the group then the group entity would need to determine if the departure necessitates a revision to the DFA. In such a case the certification body that issued the certificate should be consulted.

Annex B (informative)

Certification framework

Note: *This Annex is not a mandatory part of this Standard.*

B.1 General

B.1.1

Part of the certification process for a DFA involves determining whether the organization has met

- a) public participation requirements (see Clause 5);
- b) SFM performance requirements (see Clause 6); and
- c) SFM system requirements (see Clause 7).

This determination involves an audit undertaken by a third-party independent certification body accredited by a full International Accreditation Forum (IAF) member accreditation body such as the Standards Council of Canada (SCC). This audit includes an on-site audit of the DFA and field inspections of forest sites. The organization may be structured as a single site certification, a multi-site certification or a group certification. See Clauses 5.5 and 7.7 for requirements on multi-site certification and group certification.

B.1.2

Accredited certification bodies require that an organization meet the SFM requirements to achieve certification. If a nonconformity is raised, the individual certification bodies define whether it is a major or minor nonconformity. While minor nonconformities do not necessarily prevent certification, major nonconformities will normally preclude an organization from initial certification or lead to suspension, withdrawal, or reduction of the scope of an existing certification, unless the major nonconformities are addressed by the organization within the time frame communicated by the certification body. These decisions are made by individual certification bodies, who are guided by the importance and consequences of nonconformities.

While it is up to the certification body to determine nonconformities, a major nonconformity is any one or combination of the following:

- a) one or more requirements of this Standard have not been addressed in the organization's documentation;
- b) one or more requirements of this Standard have not been implemented; or
- c) several nonconformities exist that, taken together, lead the certification body to conclude that one or more requirements of this Standard have not been met.

B.2 Certification process

B.2.1 General

Clause B.2 specifies the steps taken by an organization to obtain certification to this Standard by a certification body. The initial certification audit is conducted in two stages: the document and readiness review (stage 1) and the implementation audit (stage 2).

B.2.2 Application

A list of accredited certification bodies is available from accreditation bodies, such as the SCC. The certification bodies will require the organization to provide initial information that will allow the

certification body to determine certification requirements such as the scope of certification and audit duration.

B.2.3 Document and readiness review (stage 1)

The purpose of the document and readiness review is to audit the organization's management system documentation, to evaluate the site-specific conditions of the DFA and to determine the organization's preparedness for the implementation audit. All necessary information and documentation from the applicant is provided to the certification body to facilitate a review of the organization's understanding of the requirements of this Standard. The document and readiness review generally takes place in the organization's office, with some time spent in the DFA assessing actual forest conditions, operations, and the organization's field interpretation of values, objectives, indicators, and targets.

B.2.4 Implementation audit (stage 2)

The purpose of the implementation audit is to verify that the organization meets the requirements of its documentation, its SFM plan, and this Standard, and that the requirements of this Standard are effectively implemented. A high proportion of the audit time is spent in the DFA assessing actual forest conditions, operations, and the organization's field interpretation and implementation of values, objectives, indicators, and targets. Auditors also meet with stakeholders about the public consultation process and any concerns related to the certification. The audit team makes a recommendation for certification based on the audit results.

B.2.5 SFM audit reports

The audit report is prepared under the direction of the audit team leader, who is responsible for its accuracy and completeness as specified in standards applicable to certification bodies. The audit report should contain the audit findings with reference to supporting evidence.

B.2.6 Certification

The certification body makes the final certification decision after reviewing the audit file, including:

- a) auditors' recommendations;
- b) nonconformities, associated corrective action plans, and implementation of corrective action plans;
- c) documents and audit reports;
- d) auditor's notes;
- e) records of objective verifiable evidence; and
- f) justifications for conformity and nonconformities to this Standard, and associated checklists, process and technical reviews, etc.

B.2.7 Surveillance audits

A surveillance audit takes place within 12 months from the last day of the stage 2 audit and annually thereafter to provide assurance that the organization is continuing to effectively meet the SFM requirements.

B.2.8 Re-certification audit

A re-certification audit takes place before the organization's certificate expires, and a new certificate is issued if the certification body confirms the continued conformity and effectiveness of the organization's SFM system.

B.2.9 Appeals and complaints

During the certification process, the organization may challenge a certification body's decision by submitting an appeal. Each certification body is required to have a publicly available appeals process.

Complaints regarding an organization's certification to this Standard can be filed by any interested party, including those involved in the public participation process. If the complaint is in regard to the contents of this Standard, CSA Group should be contacted. If the complaint pertains to a certified organization and its implementation of the requirements of this Standard, the certification body should be contacted. Each certification body is required to have a publicly available complaints process.

After implementing the certification body's procedures, if the appeal or complaint is not addressed to the satisfaction of the appellant or complainant, the applicable accreditation body may be contacted.

B.2.10 Impartiality

To ensure the impartiality of the certification body and the audit process, the members of the audit team and those involved in the certification decision, should be independent of the organization and the organization's activities on the DFA. In addition, they should be objective and free from bias and conflicts of interest throughout the process.

B.2.11 Competence

The certification body should determine the competence required for each function in the certification activity, and should ensure that auditors are knowledgeable of its audit processes, certification requirements and other relevant requirements. The certification body should use auditors only for those certification activities where they have demonstrated competence with regard to the requirements of this Standard.

The certification body should assemble an audit team with the requisite expertise and appropriate knowledge and skills relevant to the scope and geographic areas of the audit.

Annex C (informative)

Bibliography

Note: This Annex is not a mandatory part of this Standard.

The following list of publications were used as informative references in developing this Standard. While these reference are not directly referenced within this Standard, they have helped to inform the development of it.

Canadian Standards Association

CAN/CSA-ISO 19011-03 (R2007)

Guidelines for quality and/or environmental management systems auditing

CAN/CSA Z731-03

Emergency preparedness and response

CCFM (Canadian Council of Forest Ministers)

Criteria and Indicators of Sustainable Forest Management in Canada: National Status, 2005

<http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/27407.pdf>

Defining Sustainable Forest Management in Canada: Criteria and Indicators, 2003

<http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/23636.pdf>

Criteria and Indicators of Sustainable Forest Management in Canada: Technical Report, 1997

<http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/10350.pdf>

Ducks Unlimited

Smith, C. *Integrating Wetlands into Forest Management: Why It Matters*. Toronto: Ducks Unlimited, 2015. [Power Point Slides]

NRCAN (Natural Resources Canada)

Ménétrier, Jean. *Afforestation of Wildlands: Forest 2020 Plantation Demonstration and Assessment Program in Quebec: Practical Guide 2005*. Sainte-Foy, Québec: Gouvernement Du Québec, Direction De La Recherche Forestière, 2005.

Operational-Scale Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3), Version 1.2 User's Guide, 2011

<http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/33710.pdf>

The State of Canada's Forests — Annual Report, 2014.

<http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/35713.pdf>

SCC (Standards Council of Canada)

CAN-P-15 (2000)

Accreditation Programs: Requirements and Procedures for Suspension and Withdrawal, Complaints, Appeals and Hearings

School of Forest Resources & Conservation, University of Florida

Hubbard, W. et al. *Forest Terminology for Multiple-Use Management*. University of Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, 1998.



**CSA
Group**