

Ministry of Natural Resources and Forestry

Forest Operations and Silviculture Manual

March 2017

Policy Division

Crown Forests and Lands Policy Branch



FOREST OPERATIONS AND SILVICULTURE MANUAL

Prepared under the Authority of the Crown Forest Sustainability Act, 1994

March 2017

Ministry of Natural Resources and Forestry

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1 **PREFACE**

2 The Crown Forest Sustainability Act (1994) (CFSA) came into effect on April 1, 1995.
3 The Act is enabling legislation and provides for the regulation of forest planning,
4 information, operations, licensing, trust funds, processing facilities, remedies and
5 enforcement, and transitional provisions. The CFSA is designed to allow for the
6 management of all forest-based values, while providing for the sustainability of Crown
7 forests. The CFSA defines sustainability as long-term Crown forest health, and reflects
8 the broad direction set out in the Policy Framework for Sustainable Forests.

9
10 The Forest Operations and Silviculture Manual (2017) (FOSM) is one of four regulated
11 manuals mandated by the Crown Forest Sustainability Act. FOSM is formatted as a
12 reference manual of guidance and direction to be used by forest management planning
13 teams and others involved in implementing forest management plans. FOSM contains
14 high level principles, standards and purposes for this guidance and direction. FOSM is
15 organized as a directory, because the direction and guidance incorporated by reference
16 can be readily updated and kept current with technical and scientific advances in forest
17 management operations and silviculture.

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1 PART 1: INTRODUCTION

2 1.1 Purpose and Function

3 This Forest Operations and Silviculture Manual (2017) (FOSM) sets out the over-
4 arching principles and accepted approaches for forest management, the standards for
5 forest operations and silvicultural practices, the minimum qualifications for forestry
6 workers, and the procedures for the evaluation of forest management in Ontario.

7 FOSM functions as a directory of the approved policy and guidance that a *forest*
8 *manager* must refer to during the preparation and implementation of a *forest*
9 *management plan* (FMP). All guidance and direction described in Parts 2, 3 and 4 of
10 FOSM must be used during the preparation of forest management plans and for the
11 implementation of forest operations (CFSA, sections 7 to 23) as instructed by the Forest
12 Management Planning Manual (2017) (FMPM).

13 FOSM is required under section 68 of the Crown Forest Sustainability Act (1994)
14 (CFSA). Sections 42 to 47 of the CFSA describe how forest operations will be
15 conducted in Crown forests. In particular, section 43 requires that forest operations in
16 Crown forests must be in compliance with FOSM.

17 Declaration Order MNR-75, MNRF's Environmental Assessment Requirements for
18 Forest Management on Crown Lands in Ontario – short form – Declaration Order MNR-
19 75, also identifies required content for FOSM (condition 6a).

20 FOSM incorporates, by reference, the guidance and direction approved by the ministry
21 for the purposes of forest operations and silvicultural practices. In some cases, the
22 overarching standards and principles of the guidance and direction referenced are also
23 set out in this Manual.

24 **The documents referenced by FOSM may be updated from time to time. When a**
25 **specific document or title is referenced in FOSM, refer to the most up to date**
26 **version of that document. In some cases the document will set out**
27 **implementation and phase-in provisions that will help determine whether the**
28 **current version or a previous version of the document applies.**

29 The Ministry of Natural Resources and Forestry (MNRF) relies on the professional
30 judgement of forestry experts to manage the forest resource responsibly and
31 sustainably within the context of a broad set of standards, guidelines and principles.

1 These standards, guidelines and principles are prescribed through the guidance and
2 direction set out in FOSM.

3 **1.1.1 Organization of FOSM**

4 FOSM is organized into four parts:

- 5 • **Part 1** describes FOSM and its function within the broader context of forest
6 management in Ontario.
- 7 • **Part 2** sets out the provincially approved guidance and direction that applies
8 during forest management planning and implementation activities.
- 9 • **Part 3** outlines the minimum qualifications and certification program requirements
10 for forestry workers to engage in forest operations.
- 11 • **Part 4** contains information about the evaluation of forest operations to ensure
12 that the objectives of the forest management plan are being met.

13 Appendices and a glossary follow that support the main text of the manual.

- 14 • **Appendix A** is a list of the guidance and direction incorporated by reference in
15 the Manual.
- 16 • **Appendix B** provides a formal reference list of all documents listed in the
17 Manual.
- 18 • **The Glossary** lists and defines the specialized forest management terms used in
19 FOSM. The terms for which a definition is provided in the glossary are italicized
20 within the body of FOSM.

21 **1.1.2 Application of FOSM**

22 FOSM sets out guidance and direction to be referenced in the preparation of a FMP and
23 in the implementation of forest management activities. As such, the documents
24 referenced in this Manual may be applicable during the management of Ontario's Crown
25 forests that are not addressed by the FMPM (i.e. those forests outside of the Area of the
26 Undertaking). The Forest Management Planning Manual for Ontario's Crown Forests
27 (2017) (FMPM) provides instructions to forest managers to consult FOSM for specific
28 guidance and direction when preparing an FMP.

1 The guides, manuals and policy direction referred to in FOSM are based on best
2 available science and expert advice, and they describe the practical application of this
3 knowledge for the purposes of achieving sustainable forest management. For the
4 purpose of this Manual, the term ‘forest manager’ means the sustainable forest
5 licensee, the Crown, or another designated party responsible for preparing and
6 implementing a forest management plan.

7 The key to good forest management is common sense and practical application of the
8 principles and direction contained in the approved policy set out in FOSM, in concert
9 with the ministry’s other regulated forest management manuals. It means that in most
10 cases the approved direction for an operational or silvicultural activity will be applied,
11 recognizing that in some local situations, what is most practical or sensible may require
12 using forest management methods that deviate from the approved direction. All such
13 deviations must be documented with defensible rationale and approved in the FMP.
14 Compliance with the FMP is determined following implementation through the forest
15 operations compliance monitoring program.

16 **1.1.3 FOSM’s Associated Policies**

17 Some sections of FOSM refer to associated policies that provide additional guidance or
18 direction for implementation of the manual. From time to time additional policy direction
19 may be added to FOSM’s Associated Policies to support the implementation of the
20 operational and silvicultural direction set out in FOSM. FOSM’s Associated Policies will
21 be posted on a publically accessible website alongside the manual.

22 **1.2 Four Manual Approach to Achieving Forest Sustainability**

23 The CFSA is the legislative means by which the Province of Ontario ensures that its
24 Crown forests are managed to meet the social, economic and environmental needs of
25 present and future generations. The CFSA requires the preparation of four manuals to
26 guide various aspects of forest management in Ontario. The four manuals developed by
27 the MNRF, in collaboration with non- government organizations, are the:

- 28 • Forest Management Planning Manual for Ontario’s Crown Forests (2017)
29 (FMPM)
- 30 • Forest Information Manual (2017) (FIM)
- 31 • Forest Operations and Silviculture Manual (2017) (FOSM)

1 • Scaling Manual (2007)

2 The FMPM requires that every FMP has a description of the current condition of the
3 respective management area, along with management objectives relating to forest
4 diversity, social and economic well-being, values protection and forest renewal. FMPs
5 set out the forest management activities, including road access, timber harvest, forest
6 renewal, and maintenance that may occur on the management unit.

7 FMPM outlines the process and content requirements of an FMP. FMPM provides
8 instructions on the use and application of the guidance and direction in FOSM within the
9 forest management program. FMPM also provides instruction on all other policies or
10 direction that must be considered in the planning and implementation of forest
11 management activities.

12 FOSM sets out a list of the approved guidance and direction that must be applied during
13 the preparation and implementation of the FMP.

14 FIM describes the information requirements the MNRF has to support forest
15 management. The FIM also provides for the sharing and exchange of forest-related
16 information between the MNRF and Ontario's forest industry.

17 The Scaling Manual contains instructions and standards for the measurement of Crown
18 forest resources, provides instructions for the authorized movement of Crown forest
19 resources and sets out the requirements for conducting scaling audits.

20 The four manuals are revised, improved, and updated based on experiences in using
21 the manuals, and as new information becomes available. Revisions to the manuals will
22 be made in accordance with the CFSA regulation requiring public review and comment.

23 **1.3 Evaluation of Forest Management**

24 FMPM and FOSM both provide direction on how sustainable forest management and
25 forest operations are evaluated in Ontario. FMPM provides direction on the
26 determination of sustainability through the identification of measurable indicators of
27 objective achievement. The CFSA requires that management objectives be created for
28 forest diversity, social and economic well-being, provision of forest cover and for
29 silviculture. FOSM conveys the required standards and evaluation procedures for forest
30 operations and for forest management.

1 **1.4 Principles and Approaches to Forest Management in Ontario**

2 The Policy Framework for Sustainable Forests (the framework) is a statement of the
3 Ontario Government released on April 6, 1994, that provides the principle-based
4 context for forest management in Ontario. The framework sets an overarching goal:
5 to ensure the long term health of our forest ecosystems for the benefit of the local
6 and global environments, while enabling present and future generations to meet
7 their material and social needs.

8 The framework also defines forests as ecosystems, consisting of all flora and fauna,
9 and the soil, air, water and other components of nature. The framework establishes
10 that forest sustainability means keeping these ecosystems in good condition so that
11 future generations may benefit from them. To achieve sustainability, forest policy
12 must ensure that clear objectives are described and understood, and that desired
13 future conditions are clearly defined so that actions can be compatible and aligned
14 with realizing and maintaining the desired condition.

15 Two of the principles for sustaining forests listed in the policy framework are:

- 16 • Forest practices, including all methods of harvesting, must emulate, within the
17 bounds of silvicultural requirements, natural disturbances and landscape patterns
- 18 • Forest practices must minimize adverse effects on soil, water, remaining
19 vegetation, fish and wildlife habitat, and other values

20 These principles are consistent with those found in the CFSA, the key legislative
21 document directing forest management in Ontario.

22 **1.4.1 Landscape Management**

23 The policy paper, Taking a Broader Landscape Approach (2013), describes how
24 managing resources can be accomplished at a broader scale within a larger
25 environmental, social and economic context. Traditionally, resource management
26 strategies tended to be focused on smaller land areas, specific sites or populations.
27 Now resource managers concur that biodiversity conservation, sustainable resource
28 management and reconciling conflicting resource uses, are best accomplished using an
29 ecosystem based approach at a variety of scales including large landscapes. The

1 broader level perspective looks for commonalities and shared interests, and seeks to
2 coordinate activities to balance resource demands where possible. While it is
3 recognized that finer scale management is still necessary, it can be applied within the
4 broader management approach using the “coarse and fine filter approach”, described in
5 section 1.4.2.

6 Managing at a landscape scale also allows the manager to be mindful of the cumulative
7 effect of forest management practices, or the potential cumulative effects of forest
8 management with other resource management activities. For example, a single stream
9 crossing proposed in a draft FMP may in itself not be a serious threat to the ecology of
10 that stream. However, if there are already other crossings, or a power generating
11 facility, along that same waterway, there could be cumulative detrimental effects on fish
12 migration and habitat.

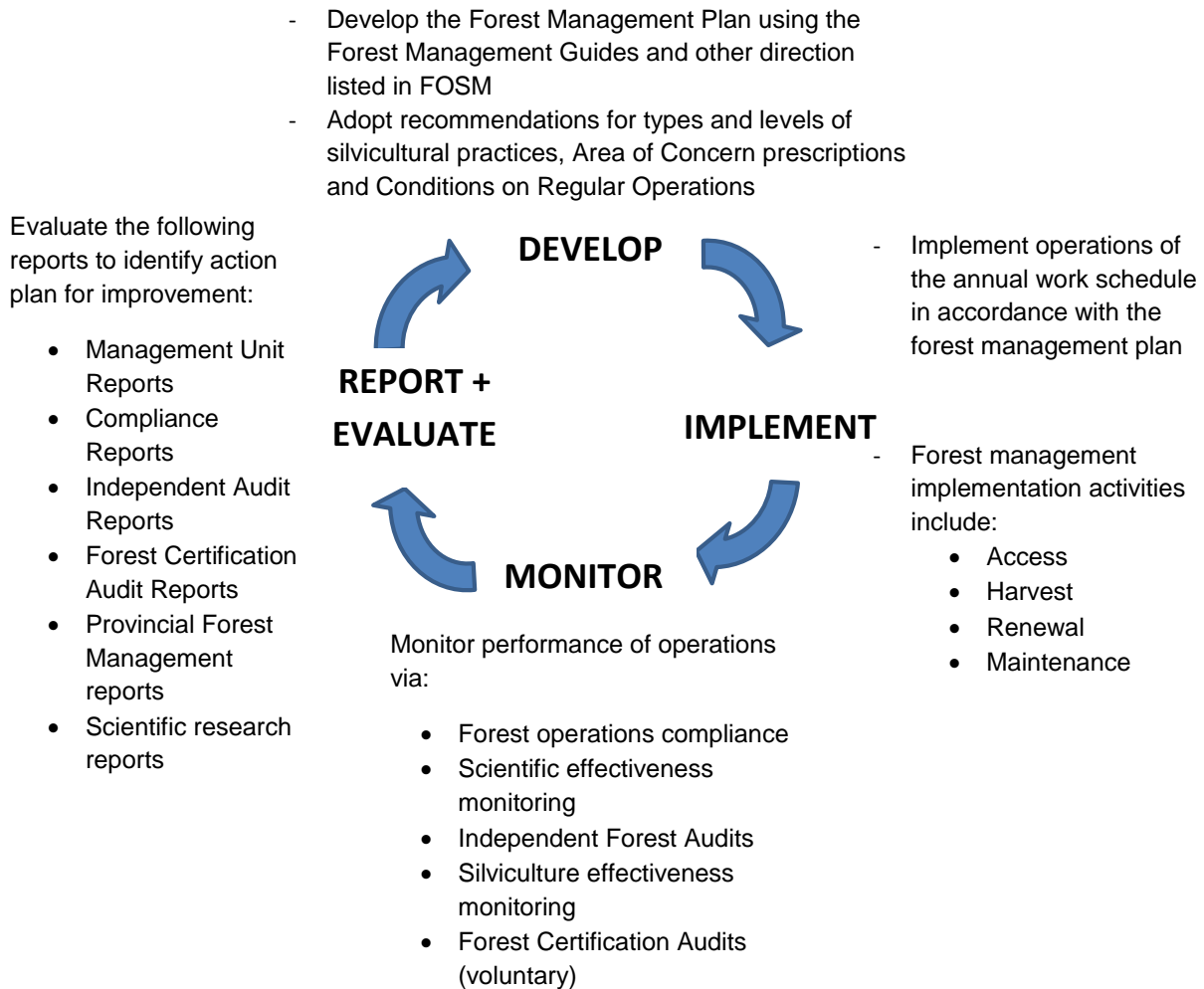
13 **1.4.2 The Coarse and Fine Filter Approach and Natural Disturbance** 14 **Emulation**

15 Natural disturbance emulation is a key principle in the CFSA for sustainable forest
16 management. The coarse and fine filter approach to biodiversity conservation asserts
17 that by maintaining a broad array of forest conditions, a broad array of species will be
18 sustained (the coarse filter), and those species which have specialized requirements will
19 have further habitat provisions to ensure their health and continuity (the fine filter).
20 Before forest management was practised, variable stand and successional states of the
21 forest were achieved by natural disturbances, such as unsuppressed wildfire. Thus, the
22 assumption is that if forest harvest and renewal activities can mimic natural
23 disturbances to the extent possible, then a broad array of forest conditions can be
24 achieved.

25 **1.4.3 Adaptive Management**

26 The MNR is guided by overarching principles for managing Ontario’s natural resources
27 and these are outlined in its strategic direction (e.g., Horizons 2020). Chief among these
28 principles is the use of the landscape approach, and to exercise precaution and special
29 concern for the ecological, social and economic value of nature. One strategy, used to
30 exercise precaution and special concern in the face of uncertainty, is to apply adaptive
31 management theory. Adaptive management is the iterative cycle of continual
32 improvement, where policy, developed based on the best available information, is
33 treated as hypotheses, and monitoring of the policy as it is implemented forms part of
34 the evaluation of the hypotheses. The policy is then revised based on the new

- 1 knowledge and lessons learned from implementation and evaluation, or from new
- 2 science and technology.
- 3 Figure 1 provides an overview of the adaptive management cycle, showing how FOSM
- 4 is integrated.



5

6 **Figure 1 Adaptive Management Cycle**

7 **1.4.4 Climate Change**

- 8 Healthy, resilient forests are best able to resist and adapt to climate change impacts.
- 9 Ontario’s sustainable forest management framework has been designed to ensure a
- 10 healthy, and therefore, resilient forest. At the foundation of that framework is the CFSA
- 11 that directs the conservation of large, healthy and diverse forests and their associated

1 ecological processes and biological diversity. Building from this foundation, the forest
2 management guides (see section 2.1 of this Manual) describe in more detail the
3 objectives (e.g. diverse range of forest types and ages) and practices (e.g.,
4 conservation of soil and water resources) that are consistent with a healthy, resilient
5 forest. These objectives and practices are then implemented through individual forest
6 management plans that reflect local decision making. All of this direction provides the
7 flexibility to adapt local forest management actions to both resist and respond to
8 potential climate change impacts. Regular monitoring (see section 4.1 of this Manual)
9 provides the necessary feedback to evaluate the effectiveness of local decisions and
10 Ontario's overall sustainable forest management framework in achieving healthy and
11 resilient forests.

12 **1.5 Maintenance of the Forest Operations and Silviculture Manual**

13
14 FOSM will be reviewed, and amended or revised as required. In an effort to keep the
15 Manual current, references to policy documents named in this manual will be interpreted
16 to refer to the most recent publicized version of the document(s) or its successor.

17 **1.5.1 Role of the Provincial Forest Technical Committee**

18 The Provincial Forest Technical Committee (PFTC), comprising government and non-
19 government technical experts, serves as advisor to the Assistant Deputy Minister,
20 MNRF, as required by Declaration Order MNR-75. PFTC's advisory role helps ensure
21 that the forest management guides are kept current with respect to scientific knowledge
22 and management practices, by reviewing proposed changes to existing guides, and
23 recommending priorities for work on new or existing guides and this helps maintain
24 FOSM's effectiveness.

25 **1.5.2 Knowledge Transfer**

26 Everyone involved in forest management planning and operations on Crown lands is
27 required to understand and comply with the requirements of FOSM. Transfer of
28 knowledge pertaining to FOSM will occur when necessary, and in concert with FMPM
29 training where feasible, to ensure that both manuals and associated documents are
30 applied consistently.

- 1 Transfer of information regarding the forest management guides or other direction and
- 2 guidance referenced in FOSM, will coincide with regular forest management planning
- 3 updates. Additional training sessions will be given separately when needed.

1 **PART 2: STANDARDS FOR FOREST OPERATIONS AND** 2 **SILVICULTURE PRACTICES**

3 This part of the Forest Operations and Silviculture Manual (2017) (FOSM)
4 incorporates, by reference, the forest management guides and policies that pertain
5 to the standards applied during the planning and implementation of forest operations
6 and silviculture practices in Ontario's Crown forests. This guidance and direction
7 forms the tool kit through which the objectives of forest management plans (FMPs)
8 will be achieved in Ontario. This part is organized under the following headings,
9 reflecting the current policy documents as of 2017.

- 10 • Forest management guides
- 11 • Old growth direction
- 12 • Forest operations prescriptions
- 13 • Silviculture direction
- 14 • Forest trusts
- 15 • Forest operations compliance program
- 16 • Other forest management policies

17 This is not an exhaustive list of all direction that a planning team may rely on. As noted
18 in the Forest Management Planning Manual for Ontario's Crown Forests (2017)
19 (FMPPM), there are other sources of direction (e.g., the Cervid Ecological Framework,
20 Crown Land Roads Manual, species at risk habitat regulations, government response
21 statements and relevant Endangered Species Act policies) which may provide helpful
22 information during the development of a FMP.

23 **2.1 Forest Management Guides**

24 The forest management guides are a key component of Ontario's sustainable forest
25 management framework. The guides provide evidence-based direction for forest
26 managers, are used to support the long term sustainability of our forest ecosystems,
27 and help to address potential adverse effects of forest management on ecological,
28 social and/or economic values in the forest.

29 The guides shall be used by forest management planning teams (planning teams) to

1 prepare forest management plans for those portions of Ontario's Crown forests within
2 the Area of the Undertaking as defined by Declaration Order MNR-75, and according to
3 the requirements of the FMPM. The guides must also be applied during plan
4 implementation by forest managers, including foresters, biologists, forest technicians,
5 and other forestry workers, to ensure operational standards are followed in the field.
6 This is particularly important when a variance from the approved forest management
7 plan (FMP) is encountered, such as the discovery of a *value* that has not been
8 previously identified in the FMP.

9 The suite of forest management guides currently comprises:

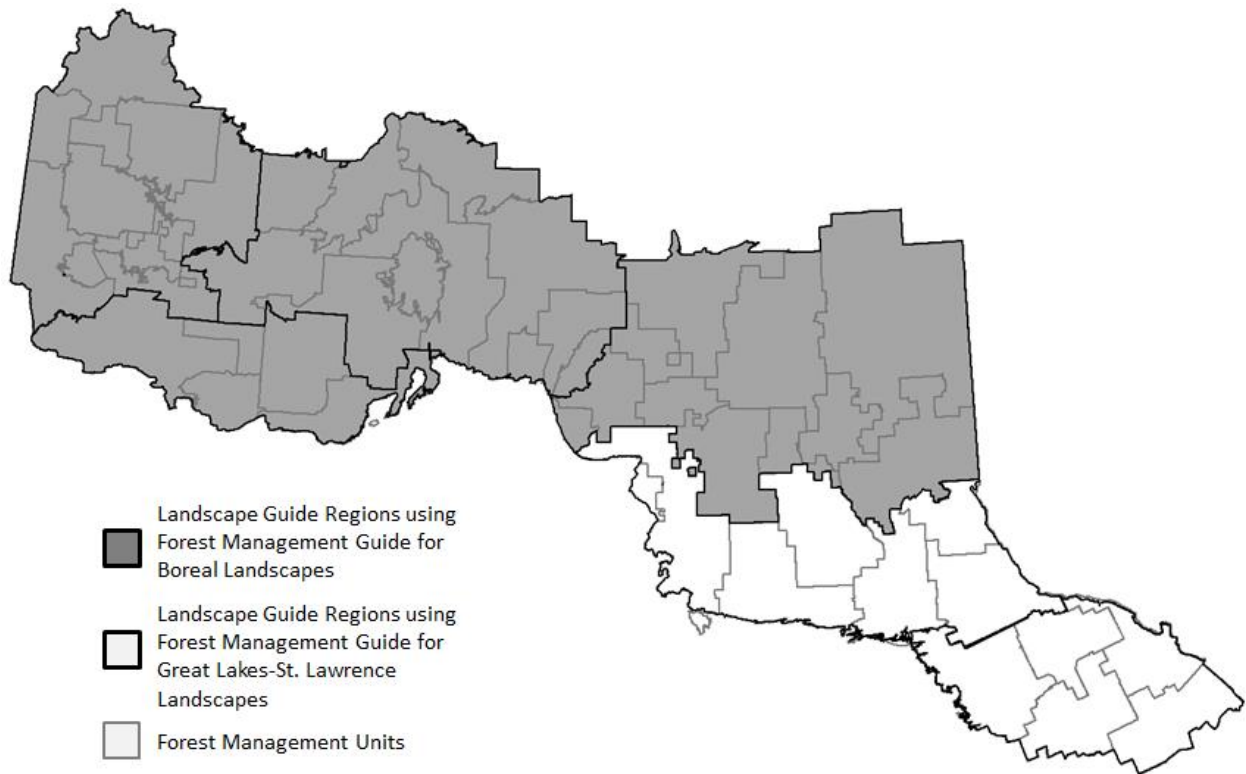
- 10 • Two landscape level guides, the Forest Management Guide for Boreal
11 Landscapes (2014), and the Forest Management Guide for Great Lakes-St.
12 Lawrence Landscapes (2010), prescribe milestones by *management unit*.
- 13 • The Forest Management Guide for Conserving Biodiversity at the Stand and Site
14 Scales (2010) and the Forest Management Guide to Silviculture in the Great
15 Lakes-St. Lawrence and Boreal Forests of Ontario (2015) provide the standards,
16 guidelines, and best management practices regarding the protection, renewal
17 and maintenance of ecosystems.
- 18 • The Management Guidelines for Forestry and Resource-based Tourism (2001)
19 provides tools and tips on business relations between the forest and tourism
20 industries, and the Forest Management Guide for Cultural Heritage Values
21 (2007) provides standards, guidelines and best management practices for the
22 protection of cultural heritage values.

23 These guides may be amended from time to time. Forest management guides
24 addressing other topics may be developed and amended as required. Those documents
25 will be developed following the obligations identified in Declaration Order MNR-75 and
26 will be deemed as being identified in FOSM until such time as the Manual is updated.

27 A more detailed description of each of the current forest management guides with
28 particular focus on their purpose, objectives, and approaches is provided in the
29 following section.

1 **2.1.1 The Landscape Guides**

2 The Forest Management Guide for Boreal Landscapes (2014), and the Forest
3 Management Guide for Great Lakes-St. Lawrence Landscapes (2010), (landscape
4 guides), use the coarse and fine filter approach described in section 1.4.2 of FOSM, for
5 setting strategic direction in forest management planning at scales of 10,000s to
6 1,000,000s of hectares. Estimated ranges of natural variation of forest composition,
7 structure and landscape pattern are used in the landscape guides as desirable levels.
8 The landscape guides include time sensitive achievable milestones for each
9 management unit. Planning teams use these milestones to develop targets for
10 biodiversity objectives. These guides are directly linked to principles from the Crown
11 Forest Sustainability Act, 1994 (CFSA) to emulate natural disturbances and landscape
12 patterns, and the five elements listed in Ontario's Taking a Broader Landscape
13 Approach (2013) policy framework, including: managing at appropriate scales,
14 integrating and coordinating, assessing and managing risk, focusing science and
15 information, and managing adaptively.



17 **Figure 2 Ontario Landscape Regions**

1 **2.1.2 Guide for Conserving Biodiversity at the Stand and Site Scales**

2 The Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales
3 (2010) (stand and site guide) shall be applied by forest management planning teams
4 and practitioners to ensure conservation of biodiversity and maintenance of long term
5 forest health when planning and implementing specific forest operations.

6 The stand and site guide provides complementary direction to the landscape guides to
7 influence the composition and pattern of ecosystems at a variety of smaller spatial
8 scales (i.e., less than 1 hectare to 10,000s of hectares).

9 Topics covered in the stand and site guide include: harvest block structure, pattern and
10 composition; aquatic and wetland habitats and shoreline forests; special habitat features
11 (e.g., bird nests, dens, bat hibernacula); and habitat for some species at risk. The stand
12 and site guide also addresses topics like road and water crossing construction and
13 maintenance, soil and water conservation (e.g., rutting, erosion, and nutrient loss),
14 salvage, and biofibre harvest operations.

15 **2.1.3 Guide to Silviculture in the Great Lakes St. Lawrence and Boreal** 16 **Forests of Ontario**

17 The Forest Management Guide to Silviculture in the Great Lakes-St. Lawrence and
18 Boreal Forests of Ontario (2015) (silviculture guide), shall be used by practitioners and
19 planning teams to determine which silvicultural activities are effective in meeting local
20 forest management objectives. Silvicultural systems, harvest methods, and treatments
21 are categorized based on the likelihood of success. Implementation includes the
22 development of silvicultural options used in setting long term management direction, the
23 creation of silvicultural ground rules, and the development and implementation of *forest*
24 *operations prescriptions* (FOPs).

25 **2.1.4 Guide for Forestry and Resource-based Tourism**

26 The Management Guidelines for Forestry and Resource-based Tourism (2001) (tourism
27 guide), shall be used by practitioners and planning teams in the development of forest
28 management plans as they relate to resource-based tourism values. The purpose of the
29 tourism guide is to facilitate discussions between the tourism and forest industries as
30 they develop operational prescriptions such that both industries are not overly disrupted
31 by each other's activities.

1 The tourism guide assists forest managers and tourist industry operators to plan forest
2 operations in Crown forests that are used for both forestry and resource-based tourism.
3 The tourism guide may also be useful during the development of *resource stewardship*
4 *agreements*. Those features of the forest used by the tourist industry are described in
5 the tourism guide in general terms. Measures which may be taken to assist with specific
6 identification of resource-based tourism values are outlined.

7 **2.1.5 Guide for Cultural Heritage Values**

8 The Forest Management Guide for Cultural Heritage Values (2007) (cultural heritage
9 guide), shall be used by planning teams in the preparation of FMPs, and by foresters,
10 biologists and technical experts during the implementation of FMPs, to ensure that
11 cultural heritage values are safeguarded during forest management activity in Crown
12 forests.

13 The cultural heritage guide classifies cultural heritage values and explains why and
14 how they need to be protected from potential negative impacts of forest management
15 operations. The cultural heritage guide prescribes the standards and guidelines that
16 must be applied for their protection and how to proceed when a value is in more than
17 one class. The cultural heritage guide also describes data sources and the
18 responsibilities for data management of the values recorded.

19 **2.2 Old Growth Direction**

20 The management of old growth from a landscape perspective must be considered in
21 planning for all forest tree species in Ontario's Crown forests.

22 Old growth is defined as: “A functional condition (e.g. stand productivity, nutrient
23 cycling, and wildlife habitat of a forest ecosystem), in a dynamic state, that embodies a
24 set of physical features and characteristics that typically include:

- 25 • A complex forest stand structure (e.g. old trees for the ecosites, large tree
26 size and wide spacing, multiple canopy layers and gaps, and rates of
27 change in species composition)
- 28 • Large dead standing trees (snags), accumulations of downed woody
29 material, up-turned stumps, root and soil mounds, and accelerating tree
30 mortality” (Source: FMPM 2017)

31 Conservation of old growth forest is linked to maintaining ecological processes,

1 conserving biological diversity, and ensuring development is sustainable. The Old
2 Growth Policy for Ontario's Crown Forests (2003) (old growth policy), provides
3 provincial direction for the identification and conservation of old growth conditions and
4 values in Ontario's Crown forests. The old growth policy provides a two pronged
5 approach for conserving old growth by providing natural heritage protection
6 (maintenance, protection and/or restoration of old growth in parks and conservation
7 areas) and it provides direction for forest management planning to maintain, protect
8 and/or restore old growth in managed forests while permitting a sustainable harvest.
9 The old growth policy shall be used by planning teams to ensure the conservation of old
10 growth is included in the FMP.

11 The landscape and stand and site guides (see section 2.1.) also contain direction that is
12 intended to maintain old growth features within managed forest habitats. The application
13 of the old growth policy, together with these guides, is intended to provide wide ranging
14 policy direction for the sustainable management of Ontario's old growth Crown forests.

15 **2.3 Forest Operations Prescription**

16 A forest operations prescription (FOP) is a site specific set of harvest, renewal and
17 tending activities expected to manage a forest stand or group of forest stands from its
18 current state to a future, desired forest state, with regard to structure and condition. A
19 FOP may also include operational prescriptions for *areas of concern* to protect a
20 specific value.

21 FOPs are integral to the silvicultural effectiveness monitoring system. FOPs map out the
22 sequence of proposed silviculture activities for a particular site, and this information
23 provides a record of the silvicultural practices used which will later help with
24 understanding the resulting forest condition.

25 The development of a FOP is dependent on having a technical understanding of
26 ecosystems and the ecosites that make up a particular ecosystem. Ecosites are
27 landscape areas consisting of vegetation type and substrate type combinations.

28 The provincial field guide, Ecological Land Classification Field Manual- Operational
29 Draft (2009) provides forest managers with a current description of the ecological
30 classifications in Ontario, and it offers a standardized language for identifying and
31 interpreting ecosystems.

1 FMPM will describe the process for preparing FOPs and the provincial ecological
2 classification system will be referenced in this process.

3 **2.4 Silviculture Direction**

4 **2.4.1 Regeneration Standards**

5 Every FOP includes regeneration standards. Regeneration standards will be developed
6 by forest managers with the planning team during the forest management planning
7 process as outlined in FMPM. The forest manager will implement the necessary
8 silvicultural prescriptions to meet the regeneration standards described in the forest
9 management plan.

10 Tracking the progress of a regenerating forest is important for sustainable forest
11 management. As part of the assessment process, the regeneration will be measured at
12 two separate points in time in accordance with the regeneration standard.

13 Regeneration is to be assessed as follows:

14 The first assessment (the assessment of establishment) is carried out to confirm the
15 establishment of regeneration and must be completed within a pre-determined
16 timeframe. The observable measures will include age, height, species composition, and
17 parameters representing the number and distribution of trees.

18 The second assessment (the assessment of performance) is carried out to confirm yield
19 predictions and must be completed within a pre-determined timeframe. The observable
20 measures will normally include age, height, species composition, measure of site quality
21 (e.g. site class or index), and parameters representing the number and distribution of
22 trees.

23 Regeneration standards are required to provide an indication that the regeneration
24 program is meeting the silviculture objectives of the FMP. Further details on how to
25 carry out assessments of establishment or performance are described in FOSM's
26 Associated Policies.

1 **2.5 Forest Trusts**

2 The MNRF oversees two forestry trusts, the Forest Renewal Trust (FRT) and the
3 Forestry Futures Trust (FFT), as set out in sections 48 to 51 of the CFSA. The two
4 forestry trusts are Crown assets. The trusts provide dedicated funding for silviculture,
5 protection and other operations in the forest. The CFSA provides that monies held by
6 the Forest Renewal and the Forestry Futures Trusts do not form part of the
7 Consolidated Revenue Fund (CRF).

8 The FRT and the FFT are administered by a trustee in accordance with trust
9 agreements entered into between MNRF and the trustee. The trustee issues payments
10 out of the trust funds in accordance with MNRF direction. From time to time policies or
11 guidelines respecting the Forestry Trusts may be set out in policies or guidelines issued
12 by the MNRF and made available as part of FOSM's Associated Policies.

13 **2.5.1 Forest Renewal Trust**

14 The purpose of the Forest Renewal Trust (FRT) is to provide dedicated funding to
15 renew the forest according to the standards specified in the approved FMP for the
16 management unit. The FRT provides for the reimbursement of silvicultural expenses
17 incurred in respect of Crown forests that have been harvested.

18 Timely renewal of the forest following harvest is critical to achieving forest management
19 objectives and to ensure sustainability of the forest. The FRT enables appropriate
20 renewal activities to be implemented to meet the standards in the approved FMP.

21 Details on the operation of the FRT, including the reimbursement process, may be set
22 out in policies or guidelines issued by MNRF and made available as part of FOSM's
23 Associated Policies.

24 **2.5.2 Forestry Futures Trust**

25 The purpose of the FFT is to provide dedicated funding for:

- 26 • Silvicultural expenses in Crown forests where forest resources have been killed
27 or damaged by fire or natural causes
- 28 • Silvicultural expenses on land that is the subject of a Forest Resource Licence
29 (FRL), if the licensee becomes insolvent
- 30 • Intensive stand management and pest control in respect of forest resources in
31 Crown forests

- 1 • Other purposes that may be specified by the Minister

2 The MNRF may also issue policies and guidelines relating to:

- 3 • Any of the purposes that have been specified by the Minister
4 • Details on the operation of the FFT, including the reimbursement process

5
6 Policies and guidelines issued by MNRF for the FFT may be made available as part of
7 FOSM's Associated Policies.

8 **2.5.3 Forestry Futures Committee**

9 The CFSA provides that the Minister may establish a Forestry Futures Committee to:

- 10 • Advise the Minister on the criteria to be used in making payments from the FFT
11 • Issue directions to the Trustee on a) how much of the FFT funds should be paid
12 out in any year, and b) what payments to make from FFT funds to best carry out
13 the criteria established by the Minister

14 **2.6 Forest Operations Compliance Program**

15 The MNRF oversees a forest operations compliance program to:

- 16 • Monitor forest operations for the prevention and mitigation of negative impacts
17 which may result from these operations

18 • Apply remedies and enforcement measures where necessary, to address the
19 occurrence of operational non compliances such as wasteful practices, trespass,
20 and unauthorized hauling of Crown forest resources

21 The compliance monitoring program is described further in section 4.1.3.

22 **2.6.1 Wasteful Practices**

23 When conducting forest operations in Crown forests, wasteful practices include the
24 following:

- 25 • Leaving high stumps
26 • Leaving merchantable timber

- 1 • Leaving merchantable trees
- 2 • Leaving lodged trees
- 3 • Not utilizing wood chip fibre

4 The Scaling Manual (2007) describes each wasteful practice and provides guidance on
5 how to carry out forestry operations to ensure that wasteful practices do not occur. The
6 Scaling Manual sets out minimum utilization standards that must be followed for all
7 forest operations unless otherwise described in an approved forest management plan.
8 For example, merchantable trees and/or wood fibre may be left at a harvest site in order
9 to satisfy silviculture and habitat requirements, or because of a market-related issue
10 associated with a certain species or product. Leaving merchantable trees at the harvest
11 site because of market-related issues must not jeopardize the silviculture or habitat
12 objectives of that harvest site. Reasons for leaving merchantable trees and/or wood
13 fibre in specific areas within a forest must be described in the approved forest
14 management plan. Failure to comply with minimum utilization standards unless
15 otherwise described in the approved forest management plan is a wasteful practice. No
16 person shall commit wasteful practices in forest operations. Procedures for the
17 determination and application of remedies authorized by the CFSA in response to
18 infractions shall be described in the Forest Compliance Handbook (2014) (compliance
19 handbook).

20 **2.6.2 Trespass and Unauthorized Hauling**

21 No person shall commit trespass or engage in the unauthorized hauling of Crown forest
22 resources.

23 *Trespass* is defined as the unauthorized harvesting or possession of Crown forest
24 resources. Unauthorized hauling of Crown forest resources is the movement of Crown
25 forest resources from the place of cutting before they are measured and counted
26 without the written approval of the minister. Further definition and detail related to
27 trespass and unauthorized hauling is found in the Scaling Manual (2007). Procedures
28 for the determination and application of remedies authorized by the CFSA in response
29 to infractions shall be described in the compliance handbook.

1 **2.7 Other Forest Management Policies**

2 **2.7.1 Aerial Application of Pesticides**

3 Pesticides, including herbicides and insecticides, are sometimes used in forest
4 management. Herbicides may be used to prepare sites for planting or to control
5 vegetation that competes with desirable regeneration (e.g., conifer seedlings).
6 Insecticides may be required to protect areas of the forest from insects such as jack
7 pine budworm and spruce budworm. Planning, notice, consultation, and approval
8 requirements for aerial herbicide and insecticide projects are set out in the FMPM.

9 Other regulations under provincial and federal legislation must also be adhered to when
10 conducting aerial spray programs. These regulations deal with health and safety, the
11 handling and application of pesticides, aircraft and pilots, the environment, the
12 transportation and handling of chemicals and fuels, and staffing and personnel.

13 Aerial applications of pesticides for renewal, tending or protection will use buffer zones
14 as prescribed in Ontario's Buffer Zone Guidelines for Aerial Application of Pesticides in
15 Crown Forests of Ontario (1992), or subsequent buffer zone guidelines agreed to jointly
16 by the Ministry of Environment and Climate Change and the MNR.

17 **2.7.2 Prescribed Burns**

18 The Prescribed Burn Manual (2014) (PB manual) contains the guidelines for planning
19 and conducting prescribed burns in Ontario. The purpose of the PB manual is to ensure
20 that there is a uniform approach to all prescribed burns and that prescribed burns are
21 done in a safe and controlled manner. Prescribed Burns are broken down into two
22 categories, high or low, based on their complexity. The complexity of a prescribed burn
23 is influenced by a number of factors including, but not limited to, the size, expected fire
24 behaviour, resource requirements, surrounding values, and ignition method. High
25 complexity burns are generally larger open burns that cover many hectares at a single
26 time while low complexity burns are generally designed for smaller scale burning that
27 can be done with minimal resources such as slash pile burning. While the PB Manual
28 (Section 2.2) allows for the submission of Low-Complexity slash pile PB applications
29 through the Annual Work Schedule (AWS), High-Complexity burns must follow the
30 standard application process and timelines. Additionally every prescribed burn in
31 Ontario requires an operational plan that must be prepared in accordance with the
32 instructions set out in the PB manual. The plan must include the following information:

- 1 • A description of the methods used to notify the public
- 2 • Clear statements of the objectives to be achieved
- 3 • A burn prescription that will meet the objectives
- 4 • A list of values (e.g., values that could be impacted by smoke or fire) and any
- 5 mitigations that might be required
- 6 • A description of ignition, suppression, safety and support measures

7 **2.7.3 Salvage**

8 In forest operations, salvage is the recovery or harvesting of timber that has been killed
9 or damaged by natural causes, such as fire, wind, flood, insects and disease.

10 Salvage cut harvest operations must be conducted in a manner that:

- 11 • Optimizes the recovery of killed or damaged timber
- 12 • Restricts further damage or infestation to the stand

13 Stumpage values of salvaged timber will be set to enhance these objectives and will be
14 established according to criteria set out in provincial policies and procedures. The
15 Scaling Manual provides direction for measuring timber originating from licensed
16 salvage operations. Salvage operations are also subject to direction in the stand and
17 site guide.

18 Where areas are killed or damaged by natural causes and these areas are salvaged,
19 the forest manager is responsible for renewing such areas to meet the regeneration
20 standards described in the forest management plan. The Forest Renewal Trust (FRT)
21 provides for the reimbursement of silvicultural expenses incurred in respect of all
22 harvested areas including salvage operations. Where a source of funds is necessary to
23 supplement the renewal funds generated from harvest of killed or a damaged resource,
24 the Forestry Futures Trust (FFT) is a potential source of funds for silvicultural
25 expenditures. Details on the operation of the FRT and FFT, including setting of charges
26 and reimbursement, may be set out in policies or guidelines issued by MNR and made
27 available as part of FOSM's Associated Policies.

1 **2.7.4 Forest Genetic Resource Management**

2 Managing genetic diversity, and ensuring an effective planting and direct seeding
3 regeneration program, requires the use of well adapted plant material. Biologically
4 and/or climatically based seed transfer guidelines have been established across the
5 province, which serve to identify areas within which the movement of tree seed and
6 stock presents low risk of maladaptation.

7 Seed management and stock movement are described in Seed Zones of Ontario (seed
8 transfer policy) (2010) that is made available as part of FOSM's Associated Policies.
9 Similarly, MNRF may from time to time establish policies on this subject or other
10 aspects of forest genetic resource management, and make them available as part of
11 FOSM's Associated Policies.

12 The seed transfer policy must be applied for all tree seed and stock used to renew
13 Ontario's Crown forests and provincially supported afforestation and reforestation
14 activities on private land. Movement of tree seed and stock within defined seed transfer
15 areas is unrestricted. Movement of tree seed and stock beyond defined seed transfer
16 areas may be necessary or desirable to respond to challenges such as seed supply
17 shortages, or as part of a climate change adaptation strategy. Movement beyond
18 defined seed transfer areas requires the approval of an appropriate MNRF
19 representative.

20 Forest managers must keep records that allow for the tracking of tree seed and stock
21 deployment. Records will include the source (e.g., seed lot number) and destination
22 (e.g., harvest block) of seed used in artificial regeneration activities.

23 Seed and stock deployment is planned for and reported on as part of the renewal
24 support activity in forest management planning. Requirements for renewal support
25 activity are described in FMPM.

26 **2.7.5 Water Crossing Protocol**

27 Forest management activities include the construction and maintenance of roads and
28 water crossings on Crown land that may potentially affect fish and fish habitat.
29 Currently, the responsibility for managing fisheries in Ontario is shared by MNRF and
30 Fisheries and Oceans Canada, and governed by the Federal Fisheries Act.

1 MNRF shall maintain a protocol for the efficient planning, review, approval and
2 monitoring of road water crossings to prevent, minimize or mitigate effects of forest
3 management activities on fish and fish habitat. The Ministry of Natural Resources and
4 Forestry/Fisheries and Oceans Canada Protocol for the Review and Approval of
5 Forestry Water Crossings (2017) (water crossing protocol), provides direction that must
6 be applied by forest managers to meet mandatory requirements for the planning,
7 construction and decommissioning of water crossings associated with forest
8 management activities in Crown forests. Implementation of the water crossing protocol
9 will be monitored through the forest operations compliance program.

1 PART 3: MINIMUM QUALIFICATIONS FOR FORESTRY 2 WORKERS

3 3.1 Forest Management Plan Author

4 The Crown Forest Sustainability Act (1994) (CFSA), states that the forest management
5 plan (FMP) and its associated forest operations prescriptions (FOPs) must be certified
6 by a *registered professional forester*. In some cases, a person specified by the minister
7 may certify FOPs. A registered professional forester is licensed under the Professional
8 Foresters Act (2000) (CFSA s.16 (3)).

9 3.2 Tree Marking

10 In order to carry out tree marking in a Crown forest, a person must possess a valid
11 Level 1 certificate in tree marking issued by or under the authority of MNR. In order to
12 audit tree marking that has been carried out in a Crown forest, a person must possess a
13 valid Level 2 certificate in tree marking issued by or under the authority of MNR.

14 A person may obtain a certificate in tree marking after completing an approved tree
15 marking course and after successfully completing an MNR approved examination
16 process. A tree marker possessing a valid certificate is trained to implement silvicultural
17 requirements and take into account ecological considerations for forest stands managed
18 using the selection or shelterwood silvicultural systems as described in the Forest
19 Management Guide to Silviculture in the Great Lakes-St. Lawrence and Boreal Forests
20 of Ontario (2015). Tree markers must refer to the Ontario Tree Marking Guide (2004) for
21 guidance on the interpretation of FMP related direction, including FOPs, area of
22 concern prescriptions, and any other relevant direction.

23 The requirement to obtain a valid certificate in tree marking will ensure a workforce of
24 experienced and well trained tree markers. Persons with valid tree marking certificates
25 have demonstrated that they are able to:

- 26 • Interpret and apply resource management standards and guidelines
- 27 • Use discretion in adapting tree marking to circumstances such as variability in
28 terrain, forest stand type, habitat conditions, ecological and social values, and
29 ecological features encountered

- 1 • Apply tree marking prescriptions in a consistent manner

- 2 Those with valid tree marking certificates have also demonstrated that they have a
- 3 working knowledge of:

- 4 • Silvicultural objectives, systems and variations to be applied
- 5 • Forest stocking levels and structural types
- 6 • The ecological requirements of the species being managed
- 7 • Indicators of tree vigour, defects, quality and the application of an acceptable tree
- 8 classification system
- 9 • How to identify and report significant ecological and social values, and ecological
- 10 features, encountered, including potentially affected *species at risk*
- 11 • How to implement area of concern prescriptions and conditions on regular
- 12 operations to address significant ecological and social values, and ecological
- 13 features, encountered
- 14 • Forest health, site, species, integrated resource management and forest product
- 15 considerations
- 16 • Practical aspects of tree marking (e.g., tools, crew organization, reading a
- 17 prescription)

18 **3.3 Forest Operations Compliance Inspectors**

19 Only a certified forest operations compliance inspector may conduct compliance
20 inspections of an ongoing or a completed forest operation on Crown lands. A certified
21 forest operations compliance inspector may inspect and report on access, harvest,
22 renewal and maintenance operations on Crown lands and the harvest of Crown trees on
23 private land. Forest operations compliance certification is not required for persons
24 engaged in effects or effectiveness monitoring, or those who are undertaking other
25 forms of monitoring or operational oversight described in the Forest Compliance
26 Handbook (2014) (compliance handbook).

27 The MNRF maintains a program for the mandatory training and certification of forest
28 operations compliance inspectors as set out in Declaration Order MNR-75. This

1 program, including compliance inspector certification processes, competency
2 requirements, and the code of ethics for forest operations compliance inspectors shall
3 be described in the compliance handbook. Directives and procedures relating to forest
4 operations compliance inspector certification will be updated in the compliance
5 handbook as required.

6 **3.4 Fire Suppression**

7 Anyone working in Crown forests and expected to use fire suppression equipment must
8 be adequately trained to use that equipment. In order to work longer during higher fire
9 danger periods, a forest manager, or other forest resource licence holder must be
10 capable of providing fire suppression operations that meet the *trained and capable*
11 standard as set out in the MNRF Modifying Industrial Operations Protocol (MIOP)
12 (2011). This protocol sets out the conditions that must be met to qualify. This protocol is
13 available on the publically accessible website.

14 Attaining the trained and capable standard includes implementing an effective fire
15 prevention program, having adequate fire suppression resources and equipment on
16 site, ensuring reliable two way communications are available to report fires immediately
17 and ensuring a minimum 25 percent of all staff involved in forest operations on a
18 particular site are trained to the standard identified in the protocol (currently MNRF
19 SP102). Operations that do not meet the trained and capable standard will be
20 considered *limited operators* and are subject to more stringent restrictions as the fire
21 hazard rises.

22 **3.5 Scalers**

23 A scaler's licence, issued by the minister in accordance with the CFSA (s. 66), is
24 required for a person to measure, count or weigh forest resources for the Crown. The
25 training and licensing requirements to become a candidate for a scaler's licence are
26 described in the Scaling Manual.

27 **3.6 Other Qualifications**

28 Other minimum qualifications are required for personnel engaged in forest operations
29 for certain activities. The certification of feller and skidder operators, the licensing of
30 pesticide applicators, those who are certified to inspect Crown land bridges and

- 1 professional engineers, for example, are covered by legislation, policies, and
- 2 procedures of other ministries.

1 **PART 4: EVALUATION OF FOREST OPERATIONS AND** 2 **MANAGEMENT**

3 The evaluation of forest operations and management occurs after a forest management
4 plan (FMP) and its associated annual work schedule are approved by the Ministry of
5 Natural Resources and Forestry (MNR) and operations have commenced.

6 Evaluation of forest operations and management typically provides an assessment of
7 forest management activities against a standard, rule or guideline, accompanied by an
8 action plan for improvement for the next iteration of the activity, following the principle of
9 adaptive management.

10 Assessment of forest management activities is carried out through two primary means:
11 monitoring and auditing.

12 **4.1 Monitoring**

13 Monitoring of forest management in Ontario is primarily carried out to assess: the
14 effectiveness of operational treatments, the effects that the treatment has on other
15 aspects of the environment, or whether the operation is in compliance with the
16 prescriptions of the forest management plan, and any other permits, plans, restrictions
17 or rules established before the treatment was applied.

18 **4.1.1 Effectiveness Monitoring**

19 Effectiveness monitoring is used to determine whether the objectives of the plan are
20 being achieved. Declaration Order MNR-75 requires MNR to maintain a silvicultural
21 effectiveness monitoring program for carrying out assessments of regeneration, as well
22 as a program of scientific studies to assess the effectiveness of the forest management
23 guides.

24 **4.1.1.1 Assessment Standards for the Evaluation of Regeneration**

25 A key principle of Ontario's forest sustainability framework is to ensure that regeneration
26 efforts are achieving the standards established in the FMP. Forest managers must
27 make observations and report on the results of their regeneration efforts. The
28 assessment results are used to make changes for improvement to the plan in
29 accordance with the principle of adaptive management. Assessments measure the

1 extent to which regeneration efforts meet the *regeneration standards*. Regeneration
2 standards are identified at the time of harvest or as amended in an annual work
3 schedule. The standards for Ontario's silviculture monitoring program are:

- 4 • The forest manager will carry out assessments to determine if regeneration
5 standards have been met
- 6 • MNRF will establish the standard for observation of regeneration (i.e., precision
7 and accuracy of measurement)
- 8 • The forest manager will determine the methodology(ies) (e.g., calibrated ocular,
9 plot based) required to meet the standard for observation
- 10 • Forest manager information will be accepted by MNRF based on the results of
11 the MNRF verification process before submission in a management unit annual
12 report
- 13 • Verified information will be used by the forest manager to inform future forest
14 management plans (e.g., baseline forecast of future forest condition is based on
15 past performance)

16 As noted in section 2.4.1, regeneration standards provide thresholds for individual stand
17 establishment and performance. All regenerating stands must be assessed in
18 accordance with the regeneration standard.

19 Direction for the assessment of regeneration may be set out in policies or guidelines
20 issued by MNRF and made available as part of FOSM's Associated Policies.

21 **4.1.1.2 Guide Effectiveness Monitoring Program**

22 The guide effectiveness monitoring program evaluates outcomes and relies on
23 hypothesis based monitoring to test how well direction in the guides produces intended
24 results. Each guide describes the approach that will be used to monitor its
25 effectiveness. Guide effectiveness monitoring is often designed, led and implemented
26 by MNRF science staff with direction regarding the principles of study design, study
27 area selection and areas of critical uncertainty provided by the Guide Effectiveness
28 Monitoring, Strategic Direction (2011). Guide effectiveness monitoring studies may also
29 be conducted by other research organizations or scientists such as the federal
30 government and universities.

1 **4.1.2 Effects Monitoring**

2 While the term effectiveness monitoring implies testing an anticipated outcome, the term
3 effects monitoring implies investigating unknown consequences. Effects monitoring is
4 done, as needed and where appropriate, through a number of scientific studies to
5 survey and record the effects of certain operations on the forest ecosystem. The
6 knowledge gained from the results of these studies are then incorporated into the
7 guidance and direction referenced in this Manual, the Forest Operations and Silviculture
8 Manual (2017) (FOSM). Such scientific studies may be conducted by MNRF or by other
9 organizations (e.g., federal government, universities, forest industry, or other forest
10 research organizations).

11 **4.1.3 Compliance Monitoring**

12 Compliance monitoring describes the comprehensive program used to monitor forest
13 operations. It encompasses a range of complementary activities (e.g., education,
14 communication, planning, inspecting and reporting) designed to encourage and ensure
15 adherence to the legislative framework. Requirements for communication, planning,
16 inspecting and reporting are directed under the Forest Information Manual (2017) and
17 the Forest Management Planning Manual for Ontario's Crown Forests (2017) (FMPM)
18 and detailed in the Forest Compliance Handbook (2014) (compliance handbook).
19 Requirements for education and training can be traced to the conditions of licences, as
20 well as the Declaration Order MNR-75.

21 Compliance inspection, a key component of compliance monitoring, examines
22 operations and activities to evaluate adherence to the standards and requirements of
23 approved FMPs, permits and legislation. Inspections of forest operations will be carried
24 out in accordance with the directives and procedures contained in the compliance
25 handbook.

26 **4.2 Auditing**

27 Independent forest audits (IFAs) are conducted on each forest management unit as
28 required by the Crown Forest Sustainability Act (1994) (CFSA) and its regulations.

29 IFAs assess compliance of forest management activities with the CFSA, the forest
30 management planning process, and planned versus actual forest management
31 activities. IFAs also assess the effectiveness of forest management activities in

1 achieving management objectives and, where applicable, assess a licensee's
2 compliance with the terms and conditions of the Sustainable Forest Licence.

3 The Independent Forest Audit Process and Protocol (2015) (IFAPP) is the policy
4 document that auditors and auditees must follow to meet the requirements of Ontario
5 Regulation 160/04 governing independent forest audits under the CFSA.

6 **4.3 Reporting**

7 The public will have opportunities to become informed about forest management
8 activities on each management unit through annual reports. The content requirements
9 for management unit annual reports are described in the FMPM and include such items
10 as wood utilization, renewal support, monitoring and assessment. Additional
11 management unit information, including trend information, assessment of objective
12 achievement and determination of sustainability are included in enhanced management
13 unit annual reports as required by the FMPM.

14 The public will have further opportunities to become informed about the condition of
15 Ontario's forests, forest management activities, and the status of sustainable forest
16 management in Ontario through provincial forest reporting (e.g., the biennial Report on
17 Forest Management, the State of Ontario's Forests Report). Reporting will provide:

- 18 • Information about forest management activity in Crown forests
- 19 • Information on the status and impact of forest disturbances on the health of
20 Ontario's Crown forests
- 21 • Statistics describing the condition of Ontario's Crown forests
- 22 • Statistics describing the available wood supply from Ontario's Crown forests
- 23 • Criteria and indicator information describing the state of Ontario's Crown forests
- 24 • An analysis of the compliance with the conditions of the Declaration Order MNR-
25 75

1 **APPENDIX A: Guidance and Direction Incorporated by**
2 **Reference**

3 **Forest Management Guides*:**

4 Forest Management Guide for Boreal Landscapes, 2014

5 Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales,
6 2010

7 Forest Management Guide for Cultural Heritage Values, 2007

8 Forest Management Guide for Great Lakes St. Lawrence Landscapes, 2010

9 Forest Management Guide to Silviculture in the Great-Lakes St. Lawrence and Boreal
10 Forests of Ontario, 2015

11 Management Guidelines for Forestry and Resource-Based Tourism, 2001

12 **Other Policy Direction*:**

13 Buffer Zone Guidelines for Aerial Application of Pesticides in Crown Forests of Ontario,
14 1992

15 Crown Land Roads Manual, 2012

16 Ecological Land Classification Field Manual- Operational Draft, 2009

17 Forest Compliance Handbook, 2014

18 Guide Effectiveness Monitoring, Strategic Direction, 2011

19 Independent Forest Audit Process and Protocol, 2015

20 MNRF/DFO Forestry Water Crossing Protocol, 2017

- 1 Modifying Industrial Operations Protocol, 2011
- 2 Old Growth Policy for Ontario's Crown Forests, 2003
- 3 Ontario Tree Marking Guide, 2004
- 4 Prescribed Burn Manual, 2014
- 5 Seed Zones of Ontario, 2010, MNRF directive FOR 06 02 01
- 6
- 7 * These guides and policy direction may be amended from time to time.
- 8

1 **APPENDIX B: References**

2

3 Ontario Ministry of Environment and Climate Change (OMECC). Declaration Order,
4 MNR-75, MNR's Environmental Assessment Act Approval for Forest
5 Management on Crown Lands in Ontario Queen's Printer: Ontario, 2015

6 OMOE. Buffer Zone Guidelines for Aerial Application of Pesticides in Crown Forests of
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24 OMNR. Forest Compliance Handbook. Queen's Printer: Ontario, 2014

- 1 OMNR. Guide Effectiveness Monitoring, Strategic Direction. Queen's Printer:
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- 5 OMNR. Forest Management Guide for Boreal Landscapes. Queen's Printer: Ontario,
6 2014
- 7 OMNR. Forest Management Guide for Great Lakes-St. Lawrence Landscapes.
8 Queen's Printer: Ontario, 2010.
- 9 OMNR. Modifying Industrial Operations Protocol. Queen's Printer: Ontario, 2011
- 10 OMNR. Scaling Manual. Queen's Printer: Ontario, 2007
- 11 OMNRF. Forest Information Manual. Queen's Printer: Ontario, 2017
- 12 OMNRF. Forest Management Guide to Silviculture in the Great Lakes-St. Lawrence and
13 Boreal Forests of Ontario. Queen's Printer: Ontario, 2015
- 14 OMNRF. Forest Management Planning Manual. Queen's Printer: Ontario, 2017
- 15 OMNRF. Horizons 2020. Queen's Printer: Ontario, 2015
- 16 OMNRF. Independent Forest Audit Process and Protocol. Queen's Printer: Ontario,
17 2015
- 18 OMNRF. MNRF/DFO Forestry Water Crossing Protocol, Queen's Printer: Ontario, 2017
- 19 Ontario Statutes. Crown Forest Sustainability Act, 1995
- 20 Rauter, M. Tree Improvement Master Plan for Ontario. Queen's Printer: Ontario, 1986

1 **APPENDIX C: Glossary of Terms**

2 The purpose of this glossary is to define and to explain terms used in forestry or that
3 appear and are of importance in the text of the Forest Operations and Silviculture
4 Manual. The definitions provided in this glossary have been taken fully, or modified from
5 an already existing source, as indicated. References for these entries are abbreviated
6 as follows:

7	CFSA	Crown Forest Sustainability Act (1994)
8	EA Decision	Environmental Assessment Board: Reasons for Decision and
9		Decision (1994)
10	EA Dec Order	Ministry of natural Resources and Forestry's Environmental
11		Assessment Requirements for Forest Management on Crown
12		Lands in Ontario (2015)
13	ESA	Endangered Species Act (2007)
14	FMPM	Forest Management Planning Manual (2017)
15	MIOP	Modifying Industrial Operations Protocol (2011)
16	OBC	Ontario Biodiversity Council (2011)
17	SDF	Sustainable Development of Forests: A Systematic Approach to
18		Defining Criteria, Guidelines, and Indicators. Seminar of Experts on
19		Sustainable Development of Boreal and Temperate Forests.
20		Conference on Security and Cooperation in Europe. Natural
21		Resources Canada, Ottawa, 1994.
22	STC	Silvicultural Terms in Canada, Science and Sustainable
23		Development Directorate, Forestry Canada, Ottawa, 1992.
24	URN	Items from Terminology of Forest Science: Technology Practice
25		and Products (1971) are listed by Universal Reference Number.

26 The source acronym is presented in brackets after the definition where appropriate.

27 **AREA OF CONCERN**

28 A geographic area established for an identified value that may be affected by forest
29 management activities. (EA Dec Order)

1 **AREA OF THE UNDERTAKING (AOU)**

2 The area of Crown land, on which forest management activities may be conducted in
3 accordance with the requirements of the EA Dec Order MNR 75 in Ontario. Forest
4 management plans are prepared for forest management units in this area. (Modified EA
5 Dec Order)

6 **BIODIVERSITY**

7 The variability among living organisms from all sources, including, among other things,
8 terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which
9 they are a part. This includes diversity within species, between species, and of
10 ecosystems. (OBC)

11 **CLAIM**

12 A request for payment or reimbursement for eligible silviculture work submitted to the
13 Ministry of Natural Resources and Forestry on a form specified by the ministry.

14 **ELIGIBLE SILVICULTURE WORK**

15 Silviculture expenses incurred for the renewal of the forest following harvest that are
16 defined in MNRF policies and procedures.

17 **FOREST MANAGEMENT PLAN (FMP)**

18 A document of that name prepared in accordance with the Crown Forest Sustainability
19 Act, 1994, for a management unit in accordance with the Forest Management Planning
20 Manual. A forest management plan sets out the forest operations that may occur on a
21 management unit by a holder of a forest resource licence while having regard for plant
22 life, animal life, water, soil, air and social and economic values, including recreational
23 values and heritage values. (CFSA)

24 **FOREST MANAGER**

25 The ministry or a licensee specified in writing by the ministry that has management
26 responsibilities for a management unit(s).

27

1 **FOREST OPERATIONS**

2 The harvesting of a forest resource, the use of a forest resource for a designated
3 purpose, or the renewal or maintenance of a forest resource including all related
4 activities. (CFSA)

5 **FOREST RESOURCE**

6 Trees in a forest ecosystem and any other type of plant life prescribed by the
7 regulations that is in a forest ecosystem. (CFSA)

8 **FORESTRY FUTURES COMMITTEE**

9 A committee that may be established by the minister pursuant to the CFSA to advise
10 the minister on matters related to the Forestry Futures Trust.

11 **FORESTRY FUTURES TRUST**

12 The trust that provides for the following matters, on such terms and conditions as may
13 be specified by the minister:

- 14 1. The funding of silvicultural expenses in Crown forests where forest resource have
15 been killed or damaged by fire or natural causes.
- 16 2. The funding of silvicultural expense on land that is subject to a forest resource
17 licence, if the licensee becomes insolvent.
- 18 3. The funding of intensive stand management and pest control in respect of forest
19 resources in Crown forests.
- 20 4. Such other purposes as may be specified by the minister (CFSA)

21 **FOREST RENEWAL TRUST**

22 A trust that provides for reimbursement of silvicultural expenses incurred in respect of
23 Crown forests in which forest resources have been harvested and for such other
24 matters as may be specified by the minister, on such terms and conditions as may be
25 specified by the minister (CFSA)

26 **HABITAT**

27 An area on which a species depends, directly or indirectly, to carry on its life processes,
28 including life processes such as reproduction, rearing, hibernation, migration or feeding,
29 and includes places that are used by members of a species as dens, nests, hibernacula

1 or other residences; or if the species is one for which a habitat regulation has been
2 made under the ESA, the area prescribed by that regulation as the habitat for the
3 species. (ESA)

4 **LIMITED OPERATOR**

5 Any forestry operation that does not meet the standard of Trained and Capable to
6 operate forest fire suppression equipment as set out by MNRF's Aviation, Forest Fire
7 and Emergency Services Branch. (MIOP)

8 **MANAGEMENT UNIT**

9 An area of Crown forest designated under section 7 of the Crown Forest Sustainability
10 Act, 1994.

11 **MNRF**

12 The Ministry of Natural Resources and Forestry, or the ministry of the Minister that has
13 been assigned to undertake responsibility for the Crown Forest Sustainability Act, 1994.

14 **REGENERATION STANDARD**

15 The required level of observable measures of a regenerating area to provide confidence
16 that the target (i.e. mature) stand condition can be achieved. Regeneration standards
17 will include both establishment and performance parameters. The standards will be
18 consistent with the definition of future forest condition used in the development of the
19 long-term management direction (e.g. development of the yield curves).

20 **RESOURCE STEWARDSHIP AGREEMENT**

21 An agreement negotiated between a licensed resource-based tourism operation as
22 determined by the Ministry of Tourism Culture and Sport, and a sustainable forest
23 licensee.

24 **SARO LIST**

25 The Species at Risk in Ontario list set out in O.Reg. 230/08 made under the
26 Endangered Species Act.

27

1 **SILVICULTURE**

2 Generally, the science and art of cultivating forest crops; particularly, the theory and
3 practice of controlling the establishment, composition, constitution, and growth of
4 forests. (URN 5385)

5 **SPECIES AT RISK**

6 Any species which is listed on the SARO list.

7 **SUSTAINABLE FOREST LICENCE**

8 A licence granted under Part III, section 26 of the Crown Forest Sustainability Act.

9 **SUSTAINABILITY**

10 Long term Crown forest health. (CFSA)

11 **SUSTAINABLE FOREST MANAGEMENT**

12 The management of forest ecosystems to maintain a healthy forest ecosystem which
13 provides a continuous, predictable flow of benefits. Indicators of forest sustainability
14 criteria are incorporated into strategic decision-making and into the periodic
15 assessments of both forest and socioeconomic conditions. Forest operations are
16 conducted in a manner that conserves forest health and minimizes undesirable effects
17 on the physical and social environments.

18 **TRAINED AND CAPABLE**

19 A standard level whereby the operator must meet four criteria to be considered "*Trained*
20 *and Capable*":

- 21 1. Effective Fire Prevention program outlined in the fire prevention and preparedness
22 section of the Forest Management Planning Manual.
23 2. Adequate Fire Suppression equipment on site as identified in the MIOP
24 3. Reliable two-way communications to report fires immediately and receive updated
25 information.
26 4. A minimum of 25% of staff on site trained in the use of suppression equipment to the
27 MIOP standard.

28 This standard is set by Aviation, Forest Fire and Emergency Services. (MIOP)

1 **VALUE**

- 2 A term used to describe a known natural, cultural, First Nation or Métis resource
3 attribute or use of land, including all lakes and streams, which must be considered in
4 forest management planning. (EA Dec Order)

