



# Forest Management Planning Standard

## Saskatchewan Environmental Code

December 15, 2023

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## **Preamble**

Forest management planning is foundational to sustainable forest management in Saskatchewan. Forest management plans provide strategic direction for the management of forest resources within forest management agreement (FMA) or area-based term supply licence (ABTSL) areas, and establishes goals, objectives and strategies to guide forest management activities conducted by the holders of FMAs and ABTSLs in Saskatchewan.

A standardized approach to forest management planning has been in place in Saskatchewan since 2007. Between 2012 and 2015, the Forest Service Branch collaborated with Saskatchewan representatives from the major forestry companies and some environmental non-governmental organizations on the development of the Forest Management Planning Standard and its subsequent adoption under the Saskatchewan Environmental Code (code) in 2017.

In 2023, the Forest Service Branch undertook a review of the Forest Management Planning Standard as part of the Ministry of Environment's ongoing assessment of its standards and legislation. The desired outcomes for the review were to clarify, refine and enhance the FMP Standard based on learnings identified by government and forest companies during the implementation and evaluation of six FMPs and associated annual report submissions.

The content and terminology of the Forest Management Planning Standard have been updated to reflect changes to the Forest Operating Plan Standard related to harvest event planning. Additionally, indicators and targets have been standardized for consistency in approach and measurement. The Forest Service Branch is committed to the periodic review and revision of the Forest Management Planning Standard to ensure continual improvement of the forest management planning process and forest sustainability.

## **Initiating and Developing a Forest Management Plan**

### **Information Note**

The following illustrative overview (Figure 1) of the forest management plan development process is provided for reference purposes only.

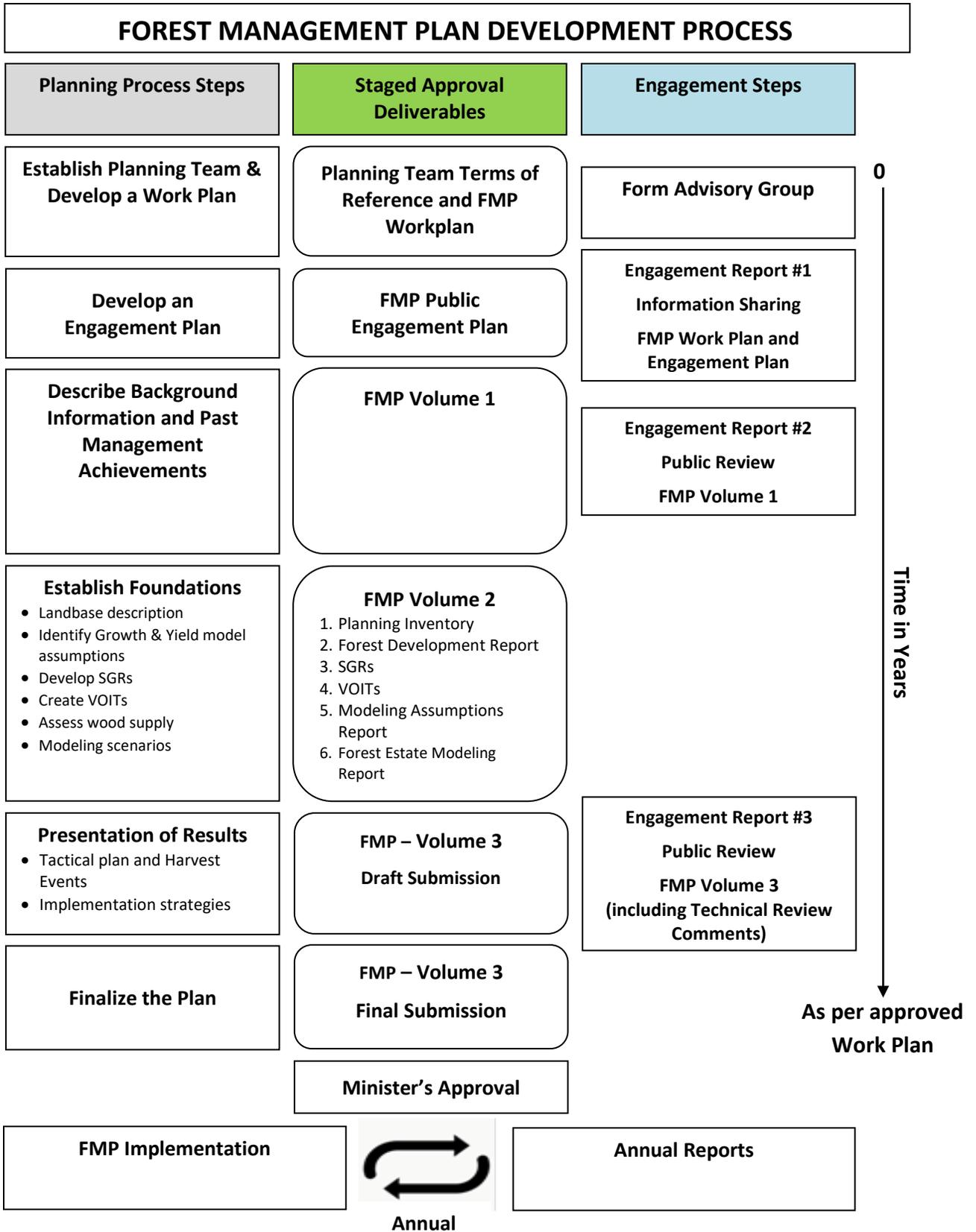


Figure 1 Forest Management Plan Development Process

### **Forest Management Plan Author**

- 1-1** (1) Prior to initiating a forest management plan (FMP), the licensee shall appoint a FMP author (plan author) who shall lead the overall development and submission of the FMP.
- (2) The plan author shall serve as the primary contact with the Ministry of Environment – Forest Service Branch.
- (3) The plan author shall lead the engagement process and liaison with the advisory group (AG) and communities, including information sharing sessions with Indigenous communities.
- (4) The plan author shall be assisted by a planning team and an AG. The plan author shall chair all planning team meetings.
- (5) All forest management plans submitted to the minister shall be signed by a qualified person as defined in the Act.

### **Forest Service Branch Strategic Planning Forester**

- 1-2** (1) The strategic planning forester shall lead all ministry representatives on the planning team and act as the point of contact between the ministry and the plan author.
- (2) The strategic planning forester shall be the recipient of all deliverable submissions and coordinate the review and staged-approval of the FMP by ministry staff.

### **Appointment of Planning Team**

- 1-3** The licensee and the strategic planning forester shall appoint representatives from their respective organizations to the planning team.

#### **Information Note**

Typically, the planning team would consist of: plan author, strategic planning forester and analyst, forester, boreal landscape specialist and analyst, advisory group members (AG), other allocation holders and the licensee's planners.

### **Appointment of Advisors**

- 1-4** The plan author and strategic planning forester shall, upon mutual agreement, appoint advisors.

#### **Information Note**

Advisors will be experts in their field and provide recommended solutions to issues related to FMP strategies and resource management.

### **Initiating the Planning Process**

- 1-5** (1) The plan author is responsible for the development of the following three deliverables prior to initiating the FMP:
- (a) planning team terms of reference;
  - (b) work plan; and
  - (c) public engagement plan.
- (2) The plan author shall schedule an introductory meeting with the strategic planning forester to discuss the composition of the planning team, and the content of the above-mentioned deliverables.

- (3) The plan author shall submit the deliverables described in subsection (1) in digital format, individually or as a combined submission, for review and approval by the Forest Service Branch.
- (4) Deliverables shall also include:
  - (a) title page;
  - (b) executive summary;
  - (c) table of contents; and
  - (d) approval page (signatory page).

### **Planning Team Terms of Reference**

**1-6** The terms of reference shall contain the following:

- (a) licence area for which the FMP is being developed;
- (b) vision, objectives and scope of the plan;
- (c) term of the proposed FMP;
- (d) name of plan author, licensee represented, and affiliation with licensee;
- (e) name of strategic planning forester;
- (f) names, position titles, and organizations represented for all planning team members and advisors;
- (g) description of the roles and responsibilities of the planning team members respecting:
  - (i) participation at public meetings, Indigenous community information sharing sessions, and AG meetings;
  - (ii) leadership for forest modeling and other resource analysis requirements;
  - (iii) development of FMP content; and
  - (iv) plan review;
- (h) dispute resolution process for resolving disagreements among planning team members, including stages of resolution and the point of involvement of senior representatives of the Forest Service Branch and the licensee;
- (i) initial schedule of planning team meetings and workshops; and
- (j) designated approvers within the ministry for each respective FMP deliverable.

### **Work plan**

**1-7** A work plan shall be prepared containing the following information:

- (a) stakeholders, Indigenous communities within or adjacent to the licence area who may be affected by the FMP, and the involvement of the stakeholders and communities;
- (b) other agencies having jurisdiction over activities in the licence area and the associated legal requirements;
- (c) expected demands for fiber for the licence area, including third party allocations and other facilities not listed in the licence agreement;
- (d) known issues and concerns regarding the management of forest resources (timber and non-timber) within the licence area;
- (e) issues and concerns regarding the availability of inventory or other sources of information;
- (f) itemized listing of the tasks required to complete the deliverables associated with FMP Volumes 1, 2, and 3, including identification of the lead person responsible for each task;
- (g) description of the tools that will be used to assess various forest estate modeling options, including the name and version of the selected forest estate model software;

- (h) schedule for the production of the FMP including progress checkpoints and anticipated timing of deliverables; and
- (i) timelines for interim review and approval.

**Progress Reporting and Amendments to the Terms of Reference and Work Plan**

- 1-8**
- (1) The plan author and the strategic planning forester shall report on progress related to the tasks set out in the approved work plan at each meeting of the planning team.
  - (2) Changes to the work plan schedule not affecting submission dates of staged deliverables will be undertaken upon mutual agreement between the plan author and the strategic planning forester and recorded in the planning team meeting minutes.
  - (3) Changes to staged deliverable submission dates shall be incorporated into an amended work plan to be submitted to the Forest Service Branch for approval.

## Public Engagement Plan

### Information Note

Engaging the public, Indigenous communities and stakeholders is an essential element to the development of the FMP.

The licensee will provide opportunity for meaningful involvement and participation of the public, Indigenous communities, and stakeholders in the plan development. This can be done through notification of opportunities for participation, reasonable timing, provision of accessible information, language used (verbal and written), cultural practices, methods of engagement, transparent reporting of results and financial support for participants.

Formal engagement opportunities must be provided throughout the various stages in the planning process.

- 1-9**
- (1) The plan author, in collaboration with the planning team, shall develop an engagement plan.
  - (2) For the purpose of subsection (1), an 'engagement plan' means a detailed proposal, applicable throughout the various stages of the forest management plan development process, as to how the licensee intends to engage with:
    - (a) the public;
    - (b) Indigenous communities; and
    - (c) stakeholders.
  - (3) Engagement activities must be focused on both local and licence-wide issues that affect Indigenous communities, stakeholder groups and others having an interest in the land, resource uses, or forest management activities within the licence area.
  - (4) At a minimum, the engagement plan shall include:
    - (a) a list of Indigenous communities and stakeholders (advisory groups, associations, non-government organizations, etc.) that the licensee intends to engage;
    - (b) how information materials will be advertised and shared;
    - (c) the location and general timing of proposed meetings (that coincide with the review of the work plan, engagement plan and, FMP Volumes 1 and 3);
    - (d) the level of engagement the licensee intends to undertake with each group to provide meaningful input to develop the FMP;

### Information Note

Informing, consulting, involving and collaborating are forms of engagement. Refer to the [IAP2 Spectrum of Participation](#) for more information on levels of engagement.

- (e) statement recognizing Aboriginal and Treaty rights and affirming that First Nation and rights-bearing Métis communities participation in the engagement processes will not prejudice these rights.
- (5) The licensee shall implement the engagement plan.

### Information Note

Refer to the [Proponent Handbook -Voluntary Engagement with First Nations and Métis Communities to Inform Government's Duty to Consult Process](#) for additional information.

### Engagement Reporting

- 1-10** (1) Following the completion of the work plan and engagement plan, FMP Volume 1 and FMP Volume 3 review periods, the plan author shall produce three separate reports summarizing the licensee's engagement with the public, Indigenous communities, advisory groups and other stakeholders.
- (2) The reports shall contain a summary of the communication, for the purposes of engagement including:
- (a) details of how and when engagement occurred;
  - (b) information and materials shared;
  - (c) issues or concerns raised and where appropriate, how the feedback will be addressed in the plan.

### Information Note

Aspects of the engagement may be considered sensitive or confidential. In these cases, summaries may be provided directly to the ministry and be redacted from the engagement reports.

### Advisory Group

- 1-11** (1) The plan author shall strive to:
- (a) appoint members to the AG who:
    - (i) represent a broad range of diversity, resource uses and community values associated with the licence area; and
    - (ii) provide advice and input to the planning team; and
  - (b) document the name and affiliation of each group or member, and the date of appointment to the AG.
- (2) As scheduled by the planning team, the AG shall provide input on:
- (a) desired forest conditions and benefits;
  - (b) management objectives, strategies, and options;
  - (c) materials to be presented at engagement sessions;
  - (d) information on locations of land uses and values;
  - (e) Values, Objectives, Indicators and Targets (VOITs) with elements relating to:
    - (i) species diversity;
    - (ii) social benefits;
    - (iii) distribution of benefits;
    - (iv) forest community well-being and resilience;
    - (v) fair and effective decision making; and
    - (vi) additional VOITs as the licensee sees fit.

## **Advisory Group Terms of Reference**

- 1-12** (1) The terms of reference shall describe the process that the Advisory Group (AG) will follow while working with both the plan author and the planning team during the development and implementation of the FMP.
- (2) The terms of reference shall contain the following:
- (a) goals, scope and role of the AG in the development of the FMP;
  - (b) process for selecting members and subset of representatives to sit on the FMP planning team, member term of service, and a description of how a range and balance of interests will be maintained within the AG;
  - (c) responsibilities of individual members, including how each will obtain input from the constituency he or she represents and report back;
  - (d) procedural matters respecting the operation of the AG, including:
    - (i) facilitation of discussions;
    - (ii) role of alternates;
    - (iii) attendance at public meetings;
    - (iv) circulation of information among AG members;
    - (v) AG member representation of its respective interest group;
    - (vi) declarations of conflicts of interest and how the AG will address those declarations; and
    - (vii) dispute resolution;
  - (e) provision of background material and training required to assist AG members in fulfilling their roles and responsibilities and to enhance their understanding of forest management planning; and
  - (f) a mechanism to amend the terms of reference.

### **Information Note**

The Advisory Group Terms of References will be submitted as reference material only.

## **FMP Volume 1 Requirements**

### **Deliverable**

- 1-13** (1) The plan author shall submit the FMP Volume 1 as a report in digital format with required GIS files for review and approval in accordance with the planning team terms of reference.
- (2) The FMP Volume 1 report shall also contain:
- (a) title page;
  - (b) executive summary;
  - (c) table of contents; and
  - (d) approval page (signatory page).

### **Description of Licence Area**

- 1-14** The plan author shall provide an overview of the licence area, including:
- (a) a historical review;
  - (b) a biophysical description;
  - (c) other land uses and values;
  - (d) a community and social profile;
  - (e) corporate profile of the licensee;
  - (f) forest management principles and certification;
  - (g) an economic profile;
  - (h) historical allocations and harvest volume reporting;
  - (i) forest management activities;
  - (j) independent operators' activities;
  - (k) significant changes expected to affect wood supply and forest management practices; and
  - (l) the FMP registry.

### **Historical Review**

- 1-15** The plan author shall provide a brief historical review of the licence area, describing:
- (a) tenure or timber harvesting rights that were in place prior to the award of the current licence;
  - (b) date of the original FMA or TSL and subsequent licence extensions or replacements;
  - (c) significant amendments to the licence document;
  - (d) changes to legal administrative boundaries of the licence area in the preceding planning period, including:
    - (i) significant changes to the licence area/boundary to date;
    - (ii) changes in gross hectares; and
    - (iii) status of the land withdrawal budget against each withdrawal period; and
  - (e) changes and accomplishments in forest management for the licence area, with particular focus on the preceding planning period, including:
    - (i) general harvest trends since the date of the original FMA or TSL licence, including the harvest trends of all independent operators;
    - (ii) access development;
    - (iii) silviculture;
    - (iv) inventory program;
    - (v) growth and yield program;
    - (vi) research program;

- (vii) tree improvement;
- (viii) work with Indigenous communities, and Indigenous and non-Indigenous stakeholders;
- (ix) development of manufacturing facilities supported by the licence area; and
- (x) other similar topics.

### **Biophysical Description of the Licence Area**

- 1-16** (1) The plan author shall describe:
- (a) climate;
  - (b) landforms;
  - (c) geology;
  - (d) soils;
  - (e) vegetation;
  - (f) watersheds of each ecoregion in the planning area;
  - (g) dominant ecosystems of each ecoregion; and
  - (h) ecodistrict characteristics, identifying unique features.
- (2) The plan author shall describe the land base within the boundaries of the licence area, including:
- (a) lands managed by the licensee;
  - (b) lands managed by the Crown and private dispositions;
  - (c) a summary of the land classes within the licence area, as defined in the Saskatchewan Forest Inventory Standard, based on the following land classifications:
    - (i) water;
    - (ii) upland forest;
    - (iii) shrubby uplands;
    - (iv) treed wetland;
    - (v) shrubby wetland;
    - (vi) open wetland;
    - (vii) treed rock;
    - (viii) rock or sand;
    - (ix) grass;
    - (x) agricultural land; and
    - (xi) anthropogenic unclassified;
  - (d) the total area by provincial forest type and the area-weighted age class distribution by cover species group, as defined in the Saskatchewan Forest Inventory Standard; and
  - (e) the definition of what constitutes the Productive Forest Land Base for this plan, including species proportions, moisture regimes, and site productivity considerations.
- (3) The plan author shall describe the wind, insect, disease, and other natural disturbance events that occurred over the last seven years in the Productive Forest Land Base further defined in clause (2)(e).
- (4) The natural disturbance event descriptions mentioned in subsection (3) shall summarize total area disturbed by:
- (a) fire events greater than 100 hectares;
  - (b) other natural disturbance events greater than two hectares, including:
    - (i) insect by type;
    - (ii) disease by type; and
    - (iii) blowdown;
    - (iv) flooding; and

- (c) all disturbance types.
- (5) At the request of the plan author, the Forest Service Branch may provide digital datasets available to support the plan development, to be included with the biophysical description of licence area, such as:
  - (a) ecoregions and ecodistricts;
  - (b) local surface landform and parent material mode of deposition;
  - (c) soils;
  - (d) watersheds for the planning area; and
  - (e) natural disturbance events.

### **Other Land Uses and Values**

- 1-17** (1) The plan author shall provide descriptions and maps of the following:
- (a) known traditional land uses and values;
  - (b) trapping areas;
  - (c) recreational uses other than areas identified with a land disposition;
  - (d) visually sensitive areas;
  - (e) known species-at-risk occurrences and distribution of habitat;
  - (f) distribution of species-of-concern habitat;
  - (g) mineral dispositions;
  - (h) oil and gas leases;
  - (i) land dispositions including:
    - (i) agriculture;
    - (ii) wild rice;
    - (iii) recreational and residential;
    - (iv) commercial and industrial;
    - (v) traditional resource use; and
    - (vi) miscellaneous use; and
  - (j) linear developments including:
    - (i) roads;
    - (ii) railways;
    - (iii) utility lines;
    - (iv) pipelines;
    - (v) trails; and
    - (vi) other linear developments.
- (2) The plan author shall:
- (a) summarize the information about all datasets used in the description of the licence area in the appendix of FMP Volume 1; and
  - (b) for each dataset provided include metadata adhering to one of the internationally recognized geospatial metadata standards.

### **Community and Social Profile**

- 1-18** The plan author shall provide data sources together with community and social profiles for each community, including Indigenous communities that are in or adjacent to the licence area, describing:
- (a) community composition and respective dependencies upon timber and non-timber resources; and
  - (b) community demographic information.

## **Corporate Profile of the Licensee**

**1-19** The plan author shall provide a corporate profile that includes:

- (a) ownership;
- (b) ownership structure;
- (c) primary sectors in which the company or companies operate;
- (d) type and capacity of forest products manufacturing facilities, and major markets served;
- (e) the administrative structure for managing the licence area, and the location of associated offices; and
- (f) how the timber resources associated with the licence relate to:
  - (i) the corporate business profile; and
  - (ii) the general wood flow for the related manufacturing facilities.

## **Forest Management Principles and Certification**

**1-20** The plan author shall describe the licensee's commitment to sustainable forest management, including the environmental management, forest certification and chain of custody certification systems to which the licensee subscribes, providing:

- (a) dates of certification; or
- (b) stage in the certification process.

## **Economic Profile**

**1-21** (1) The plan author shall describe direct and indirect economic contributions of the licensee to communities within the licence area and the province, including where appropriate:

- (a) historical trends;
- (b) current economic status; and
- (c) anticipated future contributions.

(2) The plan author shall summarize the economic activities of the licensee for all manufacturing facilities receiving timber resources and wood chips from the licence area during the current term of the FMP.

## **Historical Allocations and Harvest Volume Reporting**

**1-22** The plan author shall summarize, using the most current information available, the respective harvest volumes for the hardwood and softwood species types that have been:

- (a) allocated in the past 10 years to the main licensee and any independent operators within the timber supply area;
- (b) harvested in the past 10 years by the main licensee and any independent operators within the timber supply area, the volumes of which were considered as being part of each licensee's respective timber volume allocations; and
- (c) harvested in the past 10 years by the main licensee and any independent operators within the timber supply area, the volumes of which were considered as being salvaged timber and not part of each licensee's respective timber volume.

## **Forest Management Activities**

**1-23** The plan author shall summarize in tabular format and in GIS files, the forest management activities for the preceding 10 years, including:

- (a) operationally planned and actual harvest areas, by:
  - (i) seral stage as defined in Table 6;

- (ii) provincial forest type; and
- (iii) the resulting difference between planned and actual harvest areas;
- (b) area salvage harvested by disturbance type for all disturbances equal to or greater than 10 hectares for each:
  - (i) seral stage; and
  - (ii) provincial forest type as defined in the Saskatchewan Forest Inventory Standard;
- (c) silviculture treatment type for harvested areas by:
  - (i) year of harvest; and
  - (ii) harvest block/polygon;
- (d) regeneration status sufficiently regenerated (SR), not sufficiently regenerated (NSR) and free to grow (FTG) of all harvested areas by harvest block/polygon;
- (e) NSR areas which are not currently the responsibility of the licensee; and
- (f) for class 1, 2 and 3 roads, the distance of:
  - (i) planned road construction;
  - (ii) actual road construction;
  - (iii) the resulting difference between planned and actual road construction;
  - (iv) planned road upgrades;
  - (v) actual road upgrades;
  - (vi) the resulting difference between planned and actual road upgrades;
  - (vii) planned road reclamation;
  - (viii) actual road reclamation; and
  - (ix) the resulting difference between planned and actual road reclamation.

### **Significant Changes Expected to Affect Wood Supply and Forest Management Practices**

**1-24** The plan author shall describe:

- (a) any anticipated changes that may have an effect upon the projected harvest levels or proposed forest management activities in the FMP, resulting from:
  - (i) market conditions;
  - (ii) facility reconfigurations;
  - (iii) limitations resulting from natural disturbances; and
  - (iv) altered operating conditions; and
- (b) the actions that have been taken or contemplated by the licensee, in preparation of the anticipated changes.

### **FMP Registry**

**1-25** (1) The plan author shall summarize in an appendix:

- (a) all previous environmental assessment, operational plan approval conditions or FMP registry items;
  - (b) progress made on all commitments presented throughout the FMP; and
  - (c) major changes that have been instituted that would negate requirements to carry forward prior commitments for the proposed plan.
- (2) The plan author shall prepare an annual report for the public, pursuant to section 1-55 (2)(b), highlighting the progress and update associated with the registry items.

## FMP Volume 2 Requirements

### Deliverables

- 1-26** (1) The plan author shall prepare the following staged deliverables of the FMP Volume 2 in accordance with the planning team terms of reference:
- (a) Planning Inventory;
  - (b) Forest Development Report;
  - (c) Silviculture Ground Rules (SGRs);
  - (d) Values, Objectives, Indicators and Targets (VOITs);
  - (e) Modeling Assumptions Report; and
  - (f) Forest Estate Modeling Report.
- (2) The plan author shall submit the deliverables described in subsection (1) in digital format, for review and approval by the Forest Service Branch, and include:
- (a) a title page;
  - (b) an executive summary;
  - (c) table of contents; and
  - (d) an approval page (signatory page).

#### Information Note

The approval of each staged deliverable under FMP Volume 2 does not preclude making revisions to a deliverable in the event that mistakes or technical errors that would result in a substantive change are detected or significant changes in circumstances occur.

### Planning Inventory

- 1-27** The planning inventory shall serve as the spatial basis for the wood supply determination in support of the FMP and contain:
- (a) basic information, including:
    - (i) roads and crossings;
    - (ii) waterbodies, rivers, streams, and wetland areas;
    - (iii) riparian areas and other areas requiring special management;
    - (iv) land ownership;
    - (v) landscape level designations, such as ecoregions and watersheds; and
    - (vi) topography, such as slopes and aspects;
  - (b) planning units, established as discrete geographic areas used to administer the licence area for the term of the FMP, based on the following criteria:
    - (i) identified in collaboration with the planning team; and
    - (ii) not in excess of 500,000 hectares (gross area) unless otherwise approved;

#### Information Note

When appropriate, the licensee can designate another level of planning units to better address its business and operational needs. Likewise, for the purpose of setting and reporting on ecological targets, different planning unit boundaries may be defined as long as the above requirements are met.

- (c) a description of the forest vegetation from a forest inventory approved for use by the Forest Service Branch;

**Information Note**

The Forest Inventory Chapter requires that every license holder who is required to prepare a forest management plan shall submit a forest inventory plan if the existing forest inventory is at least 20 years old, or if a new inventory design is intended for use in the forest management plan.

**Information Note**

The term development type is used generically in this document to refer to strata used for projecting forest growth over time. License holders are free to define development types as appropriate for the ecological and management considerations of the forest within the licence area, subject to the limitations provided in Section 1-28.

- (d) current information for:
  - (i) disturbances resulting from:
    - (A) harvest activities;
    - (B) wildfire;
    - (C) wind events; and
    - (D) insect and disease infestations;
  - (ii) regeneration status of previously harvested blocks; and

**Information Note**

Wherever possible, treatments applied, regeneration assessment results, free-to-grow assessment results and survival survey results shall serve as data sources to update the planning inventory.

- (iii) non-timber values that can be spatially identified and which impact the FMP within the licence area, such as:
  - (A) riparian areas;
  - (B) visually sensitive areas;
  - (C) wildlife habitat; and
  - (D) any other non-timber values deemed necessary through discussion with the planning team;
- (e) planned harvest areas for the remaining years of the current FMP; and
- (f) file specifics for associated spatial datasets, namely:
  - (i) dataset name;
  - (ii) data format;
  - (iii) publication date, and where applicable, year of update;
  - (iv) originator;
  - (v) date obtained;

- (vi) description of planning inventory attributes, including codes and definitions;  
and
- (vii) any other relevant information.

### **Forest Development Report**

- 1-28** (1) The forest development report shall describe:
- (a) all forest development types that are specific to the licence area;
  - (b) the area of the Productive Forest Land Base occupied by each forest development type, in spatial and tabular format; and
  - (c) yield curves used to quantify current yield and project future yields.
- (2) The yield curves must provide per-hectare estimates of:
- (a) the gross biological volume in all tree stems, from the ground to the tip;
  - (b) the gross merchantable volume of hardwood stems:
    - (i) to an 8cm top diameter inside bark assuming a 30cm stump height, a minimum bole length of 5.1m, and logs no shorter than 2.7m; and
    - (ii) to a 10cm top diameter inside bark assuming a 30cm stump height, a minimum bole length of 5.1m, and logs no shorter than 2.7m;
  - (c) the gross merchantable volume of softwood stems:
    - (i) to an 8cm top diameter inside bark assuming a 30cm stump height, a minimum bole length of 5.1m, and logs no shorter than 2.4m; and
    - (ii) to a 10cm top diameter inside bark assuming a 30cm stump height, a minimum bole length of 5.1m, and logs no shorter than 2.4m; and
  - (d) the gross merchantable volume of trees to any other utilization specification(s) intended for use in setting harvest levels in the forest management plan.
- (3) Yield curves may be derived from:
- (a) adjustment of provincial yield curves, with localization for the utilization scenarios provided in subsection (2) and for average site index by development type;
  - (b) growth models which have been approved for the license-holder's use as part of the forest inventory plan pursuant to the Forest Inventory Chapter;
  - (c) empirical observations on measured sample plots, which:
    - (i) have been selected according to a sampling plan approved for use by the Forest Service Branch;
    - (ii) are located within the licence area or an ecologically similar region;
    - (iii) are spatially linked to the forest vegetation inventory; and
    - (iv) are stratified to account for the range of forest conditions on the license area;or
  - (d) empirical observations on virtual sample plots created as a result of an enhanced forest inventory product approved for the license-holder's use as part of the forest inventory plan pursuant to the Forest Inventory Chapter.
- (4) For yield curves developed pursuant to clauses (2)(c) or (d), the following conditions must be met:
- (a) a report is provided describing the statistical properties and error of the input data, as derived from an independent sample or a remeasurement with a known and acceptable sampling error;
  - (b) biometric equations and coefficients used to derive volume from tree data are provided;
  - (c) a report describing the yield modeling methods, and an evaluation of the statistical properties and error of the models is submitted;

- (d) graphic and tabular yield forecasts for each of the yield scenarios in subsection (2) are provided;
  - (e) a spatially explicit digital copy of the data from which yield curves were derived is available for confirmation; and
  - (f) the inputs, methods, and outputs are acceptable to the Forest Service Branch.
- (5) Where yield estimates are linked to silviculture treatments (such as site preparation, stocking density, stand tending, understory protection, site productivity improvement, genetic improvement of planting stock, and/or insect or disease management), then the plan author shall:
- (a) reference the silviculture ground rules (SGRs) developed in accordance with section 1-29; and
  - (b) provide a science-based rationale and supporting evidence for any yield forecasts for stands with silviculture treatment or other management intervention.
- (6) The licensee must establish a program to monitor post-harvest stand growth rates relative to the forecasted growth assumed in the FMP. Monitoring shall be:
- (a) initiated within five years of approval of the yield curves developed pursuant to subsection (3);
  - (b) based on a sampling plan approved for use by the Forest Service Branch; and
  - (c) designed in a manner that will support a population level assessment of forecasted versus actual growth rates for the timber supply area.

#### **Information Note**

With climate stability no longer a reasonable assumption, all yield forecasts will need to be monitored during the term of the next forest management plan. This subsection therefore provides a means to address climate change risks to forest management in association with section 1-49.

Current inventory processes are expected to provide reasonable estimates of current condition and growth for fire origin stands. Managed stand yield curves have the largest uncertainty around them and thus are the focus of any sampling program.

Permanent ground plots are the best method for collecting this data. A five-year measurement interval is appropriate for plots between 15 and 40 years of age, and a 10-year interval for stands after age 40.

The suggested sample size is one plot per 17,500 m<sup>3</sup> harvested, based on a five-year average cut.

#### **Silviculture Ground Rules (SGRs)**

- 1-29** (1) The plan author shall develop silviculture strategies and SGRs for all forest development types actively managed in the licence area to serve as prescriptions for forest management activities.

### Information Note

The development and refinement of silviculture strategies and SGRs provide information helping to ensure that Saskatchewan's forest lands are sufficiently regenerated in accordance with the Act, the regulations, and the code.

Forests that are regenerated successfully are essential to a long-term sustainable flow of wood products, ecosystem productivity, wildlife, water, recreation aesthetics, or any combination of forest uses.

- (2) The development and refinement of silviculture strategies and SGRs shall be based on silviculture information applicable to the licence area, including:
  - (a) data from temporary and permanent sample plots;
  - (b) best practices applicable to the development type; and
  - (c) local knowledge, and the experience gained through past management practices and activities, including silviculture:
    - (i) treatments;
    - (ii) successes and failures; and
  - (d) species ecology (autecology and synecology) and stand growth dynamics.
- (3) Silviculture strategies and any sources of information used in SGR development shall be documented in the SGR submission, considering the following:
  - (a) if the plan author plans to utilize post-regeneration yield curves that assume impacts on yield, with a transition rule that is different than 1:1 as compared to the pre-harvest yield curves, the plan author shall submit for approval to the Forest Service Branch the following:
    - (i) a description of the methodology used to determine proposed treatment responses; and
    - (ii) a list of all transition rules, displaying the responses for each treatment.
  - (b) if the plan author is not seeking to obtain benefits of adopting managed stand treatments, and is adopting natural yield curves, no further submission of evidence is required.
- (4) Each respective SGR shall include:
  - (a) SGR reference code (unique ID);
  - (b) forest transition between:
    - (i) existing forest condition, characterized by:
      - (A) area;
      - (B) yield; and
      - (C) forest development type; and
    - (ii) future forest condition, characterized by:
      - (A) percentage of future development type;
      - (B) yield group, with associated yield curve reference; and
      - (C) minimum and maximum rotation age; and
  - (c) treatment options, pertaining to:
    - (i) silvicultural system;
    - (ii) the percentage of area treated and linked to the future forest development type; and
    - (iii) silviculture treatments, including:

- (A) planting densities;
  - (B) natural regeneration;
  - (C) site preparation;
  - (D) stand tending; or
  - (E) any other silviculture treatment used to achieve future forest development types.
- (5) The plan author shall select appropriate SGRs for all forest development types to achieve regeneration that will provide for the historical presence of, specifically, softwoods in each cover species group including: Hardwood (H), Hardwood-Softwood (HS), Softwood-Hardwood (SH), and Softwood (S) at maturity.
- (6) Within each respective SGR, the plan author shall set the targets that reflect the full range of softwood abundance in H, HS, SH and S cover species groups within:
- (a) the licence area; and
  - (b) each planning unit.

### **Values, Objectives, Indicators and Targets (VOITs)**

- 1-30** (1) The plan author shall develop FMP specific VOITs as part of the requirements to conduct forest management activities on Crown forest lands in Saskatchewan.

#### **Information Note**

Table 1 illustrates the framework of values, objectives, indicators and targets (VOITs) to be utilized. Targets identified in the table are minimum requirements. The plan author may propose additional indicators and targets for each objective or propose more rigorous targets for the identified indicators.

Unless otherwise stated in Table 1, VOITs are expected to be achieved at year 10. The intent of the assessment cycle is to ensure the licensee (through the annual reporting and monitoring of VOITs) is on track to achieve targets within the planning period. Further details about the requirements of specific targets are identified in the appropriate section of the standard.

- (2) The plan author shall compile each VOIT on individual fact sheets, describing the specific:
- (a) criterion;
  - (b) element;
  - (c) value;
  - (d) objective;
  - (e) indicator;
  - (f) target, specifying:
    - (i) desired condition;
    - (ii) current condition (baseline);
    - (iii) strategy to achieve target; and
    - (iv) timeframe to achieve target, including the milestones;
  - (g) data format, including the data source;
  - (h) reporting protocol, including:
    - (i) monitoring requirements;
    - (ii) reporting requirements; and
    - (iii) reporting frequency;
  - (i) assessment cycle;

- (j) progress and achievement milestones; and
  - (k) acceptable variance.
- (3) The plan author shall prepare an annual report, highlighting the achievements associated with the VOITs in accordance to section 1-55(2)(a).

**Table 1 Summary of Values, Objectives, Indicators and Targets (VOITs) Requirements**

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
1.0 Biological Diversity	1.1 Ecosystem Diversity	1.1.1 Natural Range of Variation (NRV)	1.1.1.1 Conservation of the biological diversity of Saskatchewan's forests	1. Age class distribution	The licensee shall meet the approved age class profile target, by area, on the Managed Forest Land Base (MFLB)	Plan Author	Table/ GIS file	5 year	10 year
				2. Area of old and very old forest <sup>1</sup>	The licensee shall ensure the combined area of old and very old forest by (approved) species grouping and planning unit meets or exceeds the provincial targets of 15% of the total MFLB; of this a minimum of 5% must be very old – unless otherwise approved by the Forest Service Branch	FMP Standard or Plan Author <i>for licensees proposing alternative approaches to natural forest patterns (NFP)</i>	Table/ Map/ GIS file of Reserve Areas	Annual reporting on the target and any changes to deferred old and very old forest areas	10 year

<sup>1</sup>A minimum of 20% of the old and very old forest stands in each species grouping within the Managed Forest Land Base shall be in an interior forest condition for the term of the FMP

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				3. Size class distribution of harvest events	The licensee shall meet the approved harvest event size class distribution target (by percent harvest area)	Plan Author	Table/ GIS file Report on target by percent area and by number of events per event size class. Number of events is required for reporting purposes and does not have an associated target	Annual (On all completed harvest events)	10 year
				4. Tree retention after harvest (includes salvage operations)	The licensee shall meet the approved tree retention target by harvest event area and by the average percent at year 10  Note: Exceptions made for forest health or other reasons shall be reported by the licensee	FMP Standard/ Plan Author <i>for licensees proposing alternative approaches to NFP</i>	Table/ Imagery/ Map/ GIS file	Annual (On all completed harvest events and at least one interim report on Category 3, 4, and 5 harvest events)	5 year
				5. All forest types are maintained	The licensee shall meet approved density targets (stems/hectare)	Plan Author	Table/ Surveys/ Silviculture Treatments	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
					), consistent with SGR reference codes and modeling assumptions				
				6. Relative abundance of CSGs are forecasted to be maintained at next rotation	The licensee shall ensure that aggregate post-harvest areas maintain CSG proportions (projected to rotation) that were present at time of harvest	Plan Author	Table/ FTG Surveys/ GIS file	Annual	5 year
1.0 Biological Diversity	1.2 Species Diversity	1.2.1 Quantity and Quality of Forest Habitat	1.2.1.1 Demonstrate viable habitat for identified forest dwelling species	7. Habitat availability for:	Approved habitat supply and quality prediction targets, developed for at least 3 selected species, based on the selected management strategy  A minimum of one indicator species must be deemed a "Species At Risk" as per Species at Risk Act (SARA)	Plan Author		Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				(a) a forest-dwelling fur-bearing species; and	(a) approved measure serving to provide appropriate habitat availability (current vs. predicted future modeled supply)		(a) Graph / GIS file		
				(b) a forest-dwelling ungulate species, not-including Woodland Caribou; and	(b) approved measure serving to provide appropriate habitat availability (current vs. predicted future modeled supply)		(b) Graph / GIS file		
				(c) Woodland Caribou, if within a Woodland Caribou Conservation Unit; or	(c) habitat availability consistent with approved Woodland Caribou Range Plan Strategies (e.g., Avoidance – Tier 1 harvest deferral)		(c) Table and/or Map with GIS file		

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				(d) a forest-dwelling species or habitat identified in SARA that is not within Woodland Caribou range, and only if clause (c) of Indicator 7 is not applicable	(d) approved measure serving to provide appropriate habitat availability (e.g., avoidance – harvest deferral period, activity restrictions during identified sensitive timing window, setback distance, etc.)		(d) Table and/or Map with GIS file		
1.0 Biological Diversity	1.3 Genetic Diversity	1.3.1 Natural Genetic Diversity	1.3.1.1 No loss of natural tree genetic diversity through forest management activities	8. Seedlings are from wild or improved seed sources	Approved percentage of seedlings to be used from: (a) Wild seed sources (b) Improved seed lots  <i>See glossary for definitions</i>	Plan Author	Table	Annual	5 year
2.0 Ecosystem Condition and Productivity	2.1 The stability, resilience and rates of biological production in	2.1.1 Natural Ecosystem Processes	2.1.1.1 Maintain the stability, resilience and rates of biological	9. Post-harvest areas are successfully regenerated	Post-harvest areas assessed as FTG are consistent with the SGRs, modelling	Plan Author	Table/ GIS file	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
	forest ecosystem		production in forest ecosystem		assumptions, and the Forest Regeneration Assessment Standard				
				10. Change in the MFLB through balancing permanent and long-term removals	Approved acceptable level of the MFLB area (expressed in hectares) converted to other land uses by the licensee over the planning period, resulting from licensee operations (e.g. rights of ways for class 1 and class 2 roads and sites with dispositions such as gravel pits and timber storage sites), against areas returned to being productive	Plan Author	Table/ GIS file  (Area, reported in hectares, is calculated using the maintained and/or disturbed right-of way width (measurements used must be included in the annual report) or the maximum right of way width as per road class listed in The Forest Operations Standard multiplied by the road length in kms)	Annual	5 year
				11. Temporary change in the MFLB through balancing of short-term	Tracking net change of class 3 roads resulting from licensee operations	Plan Author	Table/ GIS file  (Linear km of class 3 road construction compared to	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				linear disturbances			linear km of class 3 road reclamation)		
				12. Net area disturbed by stand replacing natural events (fire, insect, disease and wind)	The licensee shall report the proportion of the net area impacted by stand replacing natural disturbance events over the planning period. The licensee shall initiate re-planning when this proportion exceeds the approved re-planning threshold	Plan Author	Table/ GIS file	Annual	Annual
				13. Proportion of a natural disturbance event retained un-salvaged	The licensee shall ensure that $\geq 20\%$ of the area within a salvaged disturbance event be retained intact	FMP Standard	Table/ GIS file	Annual	5 year
				14. Yield curve suitability: measured by actual harvest volume (m <sup>3</sup> /ha) compared to predicted volume	Actual harvest volumes (hardwood and softwood) are within 15% of the volume estimates predicted by the yield curves	FMP Standard	Table	5 year	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				15. The utilization assumptions specified in the yield curves are consistent with the implemented utilization specifications	The licensee shall ensure that modeled utilization specifications are adhered to over the planning period	FMP Standard	Table	Annual	5 year
				16. Operational adherence to the Tactical Plan	The licensee shall ensure that 85% of the harvested area on the licence within the 20-year plan falls within the delineated spatial boundaries of the tactical plan	FMP Standard	Table/ GIS file	Annual	5 year
3.0 Soil and Water	3.1 Quantity and Quality of Soil and Water	3.1.1 Minimise loss of quantity or quality of soil and water	3.1.1.1 Maintain and/or enhance the quantity and quality of soil and water	17. Harvesting activities are in compliance with the terms of the licence, approved operating plan, the code and standards, and applicable federal and provincial legislation	The licensee shall ensure that harvest blocks, road construction and reclamation and riparian areas comply with authorizations, the code and legislation	FMP Standard	Table/ Self- Inspection Reports	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				18. Crossings are in compliance with the terms of the licence, approved operating plan, the code and standards, and applicable federal and provincial legislation	(a) The licensee shall ensure that water course and wetland crossings installations and removals comply with authorizations, the code and legislation (b) Licensee is responsible for developing, maintaining and following standard work procedures and/or protocols to ensure inspection, monitoring, reporting and maintenance of water course and wetland crossings comply with authorizations, the code and legislation	FMP Standard	Table/ Self- Inspection Reports	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
4.0 Role in Global Ecological Cycle	4.1 Carbon Cycle	4.1.1 Productive Landbase	4.1.1.1 Mitigate the impact of the forest and forest activities on the Productive Forest Land Base	19. Event Duration	The licensee shall ensure that harvest events are completed within the timeframe associated with the event size category (expressed in years)	FMP Standard	Table/ GIS file	Annual (On all completed harvest events)	5 year
5.0 Economic and Social Benefits	5.1 Economic Benefits	5.1.1 Sustainable economic benefits over FMP planning period	5.1.1.1 Maximize the economic benefits without compromising the productive capacity of forest ecosystem	20. Utilization of Annual Allowable Cut (AAC)	Percentage of the approved AAC (hardwood, softwood and pulp) utilized in each 5-year period (expressed annually and cumulatively) is consistent with the terms of the licence, approved FMP and operating plan	FMP Standard	Table	Annual	5 year
		5.1.2 Human life and property are protected from wildfire	5.1.1.2 Minimize injury, loss and damage caused by wildfire	21. Harvest plans developed in collaboration with the Saskatchewan Public Safety Agency (SPSA) are designed to lower wildfire	The licensee shall implement treatments developed in collaboration with the SPSA to assist in reducing wildfire risk to	SPSA	Table/ Map	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
				risks to communities	communities as per the licensee's approved strategy for wildfire management				
	5.2 Distribution of Benefits	5.2.1 Fair Distribution of Benefits	5.2.1.1 To ensure that other forest uses are addressed	22. Advisory group meetings held annually	The licensee shall meet the approved target number of Advisory Group meetings <sup>2</sup> to discuss FMP issues	Plan Author	Report/ Table/ Minutes	Annual	Annual
				23. Spatially identified non-timber resources and forest use activities	The licensee shall maintain a database and produce a map identifying non-timber resources and forest use activities	FMP Standard	Digital Map	Annual	Annual
	5.3 Sustainability of Benefits	5.3.1 No Loss of Benefits	5.3.1.1 Maintain or enhance benefits	24. Harvest events are proportionally distributed across the FMA	The licensee shall ensure that approved area targets, by planning unit, for each 10-year period are achieved  The area target by planning	Plan Author	Table/ GIS file	Annual	5 year

<sup>2</sup> This would include advisory groups, co-management boards or forest management advisory committees

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
					unit should be reflective of the contributing volume by planning unit for the 20-year FMP				
6.0 Society's Responsibility	6.1 Aboriginal and Treaty Rights	6.1.1 Aboriginal and Treaty Rights are respected in regard to planning and implementing forestry activities	6.1.1.1 To ensure that Aboriginal and Treaty Rights are respected while planning and implementing forestry activities	25. Indigenous engagement	The licensee shall meet the approved target number of specific opportunities for Indigenous communities to provide input into forest management and operational plans	Plan Author	Report/ Table/ Minutes	Annual	Annual
6.0 Society's Responsibility	6.2 Indigenous Land Use and Forest Based Ecological Knowledge	6.2.1 Protection of Indigenous traditional land use and forest based ecological knowledge	6.2.1.1 To avoid impacting culturally important sites	26. Spatially identified and operationally protected culturally significant Heritage and Indigenous sites	The licensee shall ensure that known culturally significant Heritage and Indigenous sites are spatially identified (in a database) and considered during planning of forest management operations	FMP Standard	Map	Annual	5 year

Criterion	Element	Value	Objective	Indicator(s)	Target(s)	Target Source	Reporting Format	Reporting Frequency	Assessment Cycle
6.0 Society's Responsibility	6.3 Forest Community Well-being and Resilience	6.3.1 Sustainable Forest Communities	6.3.1.1 To contribute to the resiliency of communities	27. Economic contributions to communities from the forest industry	The licensee shall report on annual contributions to the Provincial economy	Plan Author	Table	Annual	5 year
6.0 Society's Responsibility	6.4 Fair and Effective Decision Making	6.4.1 Involvement of Stakeholders in FMP Development and Implementation	6.4.1.1 Improve the engagement and information sharing of stakeholders in FMP development and implementation	28. Engagement opportunities provided for stakeholders, and the public	The licensee shall ensure that it annually engages and informs stakeholders, and the public, on the implementation of the FMP <sup>3</sup>	FMP Standard	Report/ Table/ Minutes	Annual	Annual

<sup>3</sup> This will include licensee's information packages with invitations to meet, specific interest group meetings, community meetings, open houses, and any contacts (e.g. emails, faxes, phone calls, in-person meetings, field visits) initiated by the licensee, stakeholders or the public. This does not include meetings with Indigenous communities or advisory groups (addressed in VOITs #22 and #25)

## Modeling Assumptions Report

- 1-31** (1) The plan author shall prepare a report summarizing all the inputs and assumptions incorporated into the formulation of the forest estate model.
- (2) The modeling assumptions report shall include the following elements:
- (a) landbase definition, as set out in Table 2, including planning units;
  - (b) landbase net-downs, including:
    - (i) non-FMA lands;
    - (ii) land dispositions;
    - (iii) treaty land entitlements;
    - (iv) non-forested or non-productive lands;
    - (v) provincial parks;
    - (vi) designated or protected areas, representative areas and recreation sites;
    - (vii) subjective leave areas;
    - (viii) steep slopes;
    - (ix) non-commercial stands;
    - (x) riparian areas;
    - (xi) isolated areas and any other areas that do not contribute to the timber supply; and
    - (xii) net area;

Table 2 Terms and definitions to be used in the modelling assumptions report

Term	Definition
<b>Gross Land Base</b> [GLB]	The entire (gross) timber supply area land base
<b>Non-Forest Land Base</b> [NFLB]	That part of the <b>GLB</b> that does not currently and will not in the next 10 years support forests, as per the Food and Agriculture Organization of the United Nations. E.g. water, non-forested, roads, rail and corridors
<b>Forest Land Base</b> [FLB]	That part of the <b>GLB</b> that does currently or will in the foreseeable future support forests (trees established within 10 years following disturbance, as per the Food and Agriculture Organization of the United Nations). Calculated as <b>GLB</b> less <b>NFLB</b>
<b>Managed Forest Land Base</b> [MFLB]	That part of the <b>FLB</b> not within permanent exclusions, including non-FMA lands, land dispositions, Treaty land entitlements, provincial parks, designated or protected areas, representative areas and recreation sites
<b>Productive Forest Land Base</b> [PFLB]	That part of the <b>MFLB</b> which contains stands of interest for timber production, as defined on the basis of species proportions, moisture regimes, and site productivity considerations such as stands deemed non-commercial or low densities
<b>Non-Timber Harvest Land Base</b> [NTHLB]	That part of the <b>MFLB</b> not included in the <b>PFLB</b> , or that part of the <b>PFLB</b> <b>excluded</b> due to spatial considerations such as steep slopes, isolated timber and/or islands, riparian areas, planned leave areas or retention
<b>Timber Harvest Land Base</b> [THLB]	That part of the <b>MFLB</b> not excluded as <b>NTHLB</b> . <b>THLB</b> is the primary determinant of AAC

- (c) future permanent road reduction if the total area of road reduction is known;
- (d) growth and yield assumption, including:
  - (i) utilization specifications;
  - (ii) procedures of compiling the yield curves, including the data source and the date of compilation;
  - (iii) description of yield curves;
  - (iv) any factors used to adjust yield curves, such as a cull reduction factor or a product downgrade factor; and
  - (v) long-run sustainable yield (LRSY) based on each set of yield curves;
- (e) operability windows defined by a minimum harvest age and a minimum harvest volume;
- (f) transition rules (i.e. matrix format) based on the SGRs;
- (g) forest stand break-up ages by development types;
- (h) all assumptions used in mitigating the risk of natural disturbances in modeling strategies, including re-planning threshold to address losses from natural disturbances;

#### **Information Note**

A re-planning threshold is defined as a proportion of the MFLB disturbed by natural disturbances beyond which the projected sustainable timber targets and other management objectives over the planning horizon are no longer achievable. This would trigger a re-planning process.

- (i) non-timber objectives and targets including:
  - (i) natural forest patterns pursuant to section 1-33, for:
    - (A) event size class distribution targets:
      - (I) a description of any harvest block size constraints employed; and
      - (II) the rationale for using the constraints in the model formulation;
    - (B) amount of area considered as:
      - (I) old and very old seral stage retention; and
      - (II) interior forest; and
    - (C) tree retention target, using either one of the following methods to represent the associated reduction in treated area:
      - (I) area deduction; or
      - (II) AAC deduction;
  - (ii) wildlife habitat supply predictions for:
    - (A) species at risk; and
    - (B) other species; and
  - (iii) visual constraints;
- (j) harvest flow objectives, including flow constraints; and
- (k) any other relevant targets.

#### **Forest Estate Modeling Report**

- 1-32 (1)** The plan author shall prepare a forest estate modeling report, consistent with all modeling assumptions (see Section 1-31) describing:
- (a) the forest estate model formulation;

- (b) modeling scenarios and results; and
- (c) the selected management strategy.
- (2) The following model parameters and conditions shall be employed in the forest estate model:
  - (a) 200-year planning horizon; and
  - (b) 40 five-year planning periods or 20 ten-year periods.
- (3) The wood supply objective for all modeling scenarios shall default to meeting short-term (20 years) average demand of:
  - (a) all manufacturing facilities supplied by the licence area; and
  - (b) volume and product commitments to independent operators and other parties as specified in the FMA or TSL.
- (4) Where applicable, modeling scenarios shall reflect the licensee's:
  - (a) responses to input received from the public engagement process; and
  - (b) approach to visual resource management areas, including those along numbered highways, recreational lakes, and any other areas identified through the public engagement process as being visually sensitive.
- (5) Baseline scenarios shall:
  - (a) provide information regarding the maximum sustainable timber harvest levels over the planning horizon;
  - (b) be tested in accordance with the provincial baseline scenarios presented in Table 3;
  - (c) utilize a maximum fluctuation of 20% in the flow of timber, over the 200-year planning horizon;
  - (d) achieve NFP targets, including tree retention, and old and very old forest;
  - (e) utilize natural stand yield curves for the utilization specifications, as per the licence, for all commercial tree species; and
  - (f) not include any other constraints or variables.

**Table 3 Provincial Baseline Scenarios**

Scenario Number	Scenario	Modeling Objective	Flow Constraint	Top size diameter
1	Softwood	Maximize the total merchantable volumes harvested in all periods	Max. 20% variation	Top Diameter (inside bark): 8.0cm
2	Softwood	Maximize the total sawlog volumes harvested in all periods	Max. 20% variation	Top Diameter (inside bark): 10.0 cm
3	Hardwood	Maximize the total merchantable volumes harvested in all periods	Max. 20% variation	Top Diameter (inside bark): 8.0 cm

- (6) The plan author shall develop candidate (licensee-specific) modeling scenarios proposing alternative management strategies, based on objectives, treatments and constraints that shall:
  - (a) respect objectives and targets established by the Forest Service Branch for those indicators where flexibility exists;
  - (b) make use of the preliminary forecasts to develop acceptable targets;
  - (c) identify and explore alternative flow constraints; and
  - (d) support or identify alternative management strategies.
- (7) The plan author shall submit:

- (a) a list of proposed scenarios together with the differences between the proposed scenarios and the provincial baseline scenarios;
  - (b) an explanation of the process and considerations used to develop the scenarios;
  - (c) supporting preliminary forecasts; and
  - (d) additional scenarios if requested by the Forest Service Branch.
- (8) The plan author shall conduct and document the results of sensitivity analyses that assist in the selection of a management strategy.
- (9) The plan author shall describe:
- (a) how the risks of natural disturbances (including fire, insect and disease, and wind) could impact or affect the timber supply; and
  - (b) how priorities were evaluated, considering the following criteria:
    - (i) productive vs. non-productive land;
    - (ii) mature and immature forest;
    - (iii) forest age;
    - (iv) volume;
    - (v) proximity to mill;
    - (vi) recent burns;
    - (vii) insect and disease infestations;
    - (viii) social considerations;
    - (ix) road infrastructure; and
    - (x) forest economics.
- (10) The plan author shall identify uncertainty in model inputs that may significantly impact results, and explore the change in outcomes resulting from altering those inputs within a reasonable range of values.
- (11) The forest estate modeling report shall include:
- (a) the results of all baseline and candidate scenarios; and
  - (b) the licensee-specific AAC, presented in accordance with Table A1 in the Appendix.
- (12) The plan author shall provide the following model outputs, in the forest estate modeling report for the selected management strategy:
- (a) harvest volume per product, as identified:
    - (i) by development type by planning unit; and
    - (ii) in total;
  - (b) operable and total forest growing stock per planning period;
  - (c) area and volume lost to natural succession per planning period;
  - (d) area of each treatment type;
  - (e) the age class distribution for the following planning years:
    - (i) 0;
    - (ii) 10;
    - (iii) 20;
    - (iv) 50;
    - (v) 100; and
    - (vi) 200 years;
  - (f) an area summary per planning period, based on the following totals:
    - (i) operable areas for harvest; and
    - (ii) areas converted to future roads, if the road transition rule is used in the model;
  - (g) the average values per planning period, for:
    - (i) harvested stem volume, if piece size yield curves are applied in the model;
    - (ii) harvest age; and

- (iii) harvest volume per hectare;
  - (h) old and very old forest retention targets;
  - (i) any indicators representing a VOIT identified in the assumptions report;
  - (j) spatial harvest sequence for the first 20 years that demonstrates the feasibility of the tactical plan;
  - (k) non-spatial harvest sequence for the remaining 180 years of the planning horizon; and
  - (l) a discussion on targets not achieved.
- (13) The plan author shall identify a scenario to serve as the selected management strategy based on the results of the candidate scenarios, and provide a full explanation in support of the choice of the selected management strategy from the various modeling scenarios, including:
- (a) details of the differences;
  - (b) deviations; and
  - (c) improvements relative to the selected management strategy.
- (14) The rationale for the selected management strategy shall include the following:
- (a) evaluation of VOITs;
  - (b) effect of harvest levels chosen on additional or licensee-specific indicators;
  - (c) silviculture treatments; and
  - (d) design and use of planning units to achieve the desired:
    - (i) distribution of harvest; and
    - (ii) NFP targets.
- (15) The plan author shall submit all modeling scenarios including:
- (a) software-specific model scenario formulation files for all scenarios examined; and
  - (b) any model thematic codes in tabular data sets, with separate fields for each theme to support auditing by the Forest Service Branch.
- (16) The model formulation shall be provided in digital format to Forest Service Branch.
- (17) The licensee shall maintain a copy of the model formulation associated with the selected management strategy as a means to re-examine and re-use the strategy, should the need arise.

### **Natural Forest Patterns (NFP)**

- 1-33** (1) The plan author shall consider the natural range of variation associated with natural disturbance patterns to determine the distribution and size of planned harvest events, old forest and retention.

#### **Information Note**

Saskatchewan's forested landscape has been shaped over millennia by natural disturbances, and boreal forest species have evolved to thrive in this changing landscape. Forest ecological science suggests that the more closely natural forest stand and landscape patterns can be approximated by human activities, the more likely the full range of biodiversity will be maintained.

The objective of NFP is to plan harvest that resembles natural disturbances by more closely emulating the sizes, shapes, and physical structures remaining after wildfires. The natural forest pattern targets identified below aim to move the landscape closer to the Natural Range of Variation (NRV).

## Harvest Event Planning

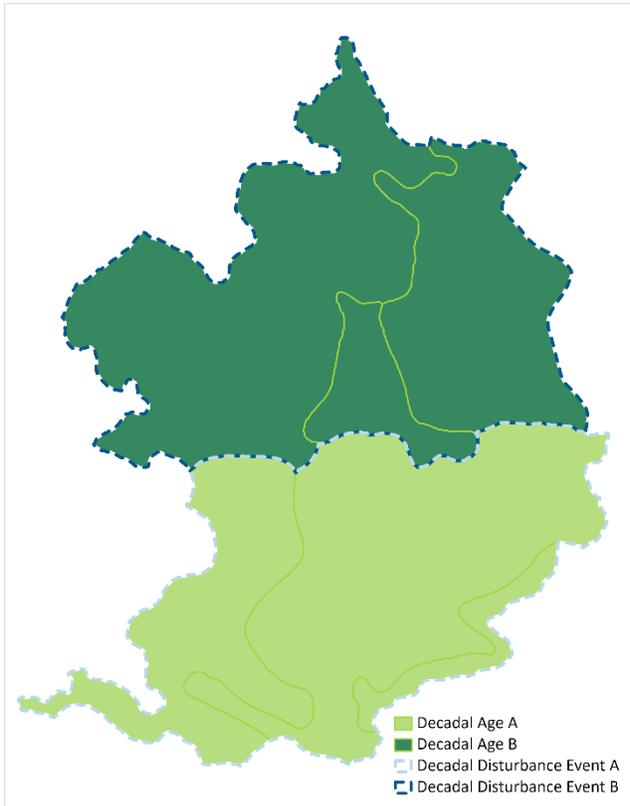
- 1-34 (1) With respect to harvest event size targets and planned harvest events, the objective of setting event size targets is to create landscape patterns that are varied and closer to NRV.

### Information Note

“In northern Saskatchewan, 86% of the area burned over the last half century is accounted for by fires larger than 8,000 hectares, and 28% of the area burned is created by fires greater than 100,000 hectares” (Andison, 2015). As such, it is not feasible to emulate the full range of natural sizes of wildfires because planning harvest events of that size distribution would not be operationally practical or socially acceptable.

*Andison, D.W. 2015. Grid-Based Natural Wildfire Patterns in Northern Saskatchewan. fRI Research Healthy Landscapes Program, Hinton Alberta. 13p.*

- (2) The starting point for determining appropriate harvest event size targets is to identify the Current Range of Variation (CRV). In order to define the CRV of disturbance size distribution for the licence area, the following process shall be followed:
- (a) identify polygons by 10-year decadal age classes, for all decadal classes;
  - (b) combine adjacent polygons (stands) of the same decadal class into single larger patches, as seen in Figure 2, assuming that adjacent 10-year age class polygons share the same, or close to, disturbance event origin;
  - (c) cluster decadal patches of common age, using GIS software, where they are within 500 metres of each other to create a decadal disturbance event, as illustrated in Figure 2;



**Figure 2 Clustering stands into decadal patches**

- (d) prepare an event size distribution summary (table) of decadal disturbance events based on CRV for the entire licence area, using the event size categories as defined in Table 4; and
- (e) calculate the percent of area and number of events that are within each event size category.

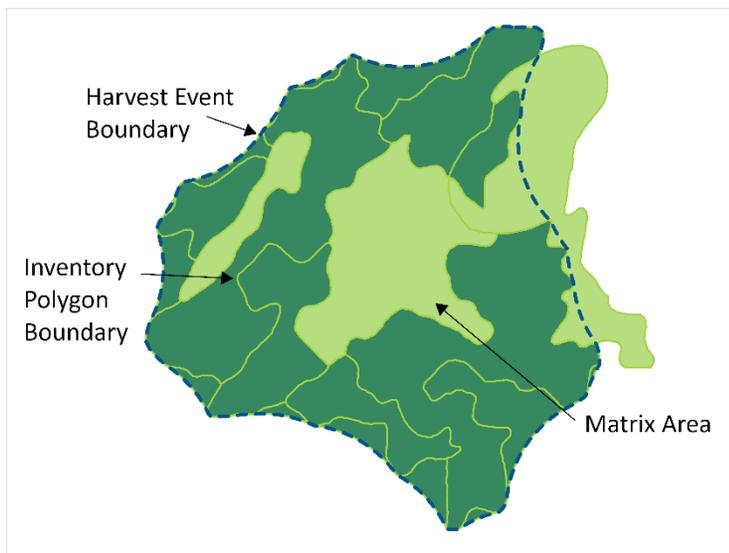
**Table 4 Event Size Categories**

Event Size Categories	Size Range (hectares)
Category 1	< 100
Category 2	101-1500
Category 3	1501-3500
Category 4	3501-8000
Category 5	> 8000

**Information Note**

The plan author may propose different event size categories, based on the natural range of variation appropriate for the licence area, with current technical and scientific rationale. Forest Service Branch will review proposed alternative approaches on technical and scientific merit and defensibility.

- (3) The plan author shall define a harvest event size class distribution target for the first 20 years:
  - (a) using the size distribution determined in subsection (2) as a reference point; and
  - (b) by identifying harvest event size distribution targets that move the landscape closer to NRV.
- (4) The plan author shall create harvest events that are proportionally distributed across the planning units and align with the harvest event size targets defined in subsection (3) using the following process:
  - (a) employ modelling software to identify potential harvest areas, by incorporating:
    - (i) goal programming such as stand aggregation and/or NFP targets; and
    - (ii) when applicable, pre-planned harvest blocks/events, other operational and timing considerations;
  - (b) use GIS software to combine any harvest areas that are within a specified distance between 350 and 500 metres of each other as illustrated in Figure 3 to form harvest events;
  - (c) manually adjust harvest events to align them with the “Harvest Event Planning – Guiding Principles” set out in the Forest Operating Plan Standard and other ecological, operational, and timing considerations;
  - (d) where operationally necessary, split category 3, 4, and 5 events into separate forest management planning events; and
  - (e) label with a unique event identifier and as decade 1, decade 2, or multi-decade.



**Figure 3** Clustering harvest areas into harvest events

- (5) Harvest events shall be completed within the allotted time period of 10, 15, or 20 years, depending on their respective size as identified in table 5.

**Table 5 Harvest Event Duration**

Event Size (ha)	*Duration (years)
< 1500	10
1501 - 3500	15
> 3500	20

\* Duration refers to the definition found in the Forest Operating Plan Standard.

**Information Note**

Completed harvest event boundaries based on actual harvest may vary from the planned harvest event boundaries.

**Seral Stage and Old Forest Targets**

- 1-35** (1) The objective of this element is to maintain old and very old forest distributions within the natural range of variation.
- (2) Seral stage definitions, as described in Table 6, shall form the basis for the targets for old and very old forest.

**Table 6 Seral Stage Definitions**

Cover Species Group	Seral Stage				
	Young	Immature	Mature	Old	Very Old
H and HS	0 – 20	21 – 70	71 – 90	91 – 110	> 110
S and SH (Jack pine)	0 – 20	21 – 70	71 – 90	91 – 110	> 110
S and SH (Spruce)	0 – 20	21 – 80	81 – 100	101 – 120	> 120

- (3) The targets for amount of old and very old forest shall consist of:
- (a) combined total of old and very old forest area that meets or exceeds 15% of the MFLB, with a minimum of 5% comprised of very old forests;
  - (b) proportional representation of approved species or, at a minimum, species groupings consisting of:
    - (i) hardwoods (H and HS);
    - (ii) softwood leading mixedwoods (SH);
    - (iii) softwoods (S) with jack pine, black spruce or tamarack leading; and
    - (iv) softwoods (S) with white spruce or other species leading; and
  - (c) distribution within each planning unit.
- (4) A minimum of 20% of the old and very old forest stands in each species grouping within the MFLB shall be in an interior forest condition pursuant to subclause (5), for the term of the FMP.
- (5) The plan author shall calculate the proportion of interior forest in accordance with the following process:
- (a) determine the total area of old and very old stands and use GIS tools to dissolve these stands into contiguous polygons;
  - (b) calculate the following ‘edge effect buffer zones’ for old and very old forest stands:

- (i) 60 metres, where the adjacent area is non-forested or a forest stand that is less than 40 years old;
  - (ii) 30 metres, where the adjacent forest stand is greater than or equal to 40 years of age and younger than mature forest, as defined in Table 6; and
  - (iii) zero metres where the adjacent stand is mature, old or very old forest;
  - (c) deduct the 'edge effect buffer zones' from the old or very old forest polygons determined in subclause (b); and
  - (d) assign species attributes back into old and very old forest polygons with interior forest attributes so species level targets can be assessed.
- (6) In the context of subsection (3), the plan author may propose different seral stage targets, based on the natural range of variation appropriate for the licence area, with supporting technical and scientific rationale. Forest Service Branch will review proposed alternative approaches on technical and scientific merit and defensibility.

#### **Information Note**

Old and very old forest may include forest stands retained on, or within steep slopes, riparian areas, isolated stands and islands greater than one hectare within harvest blocks and/or waterbodies.

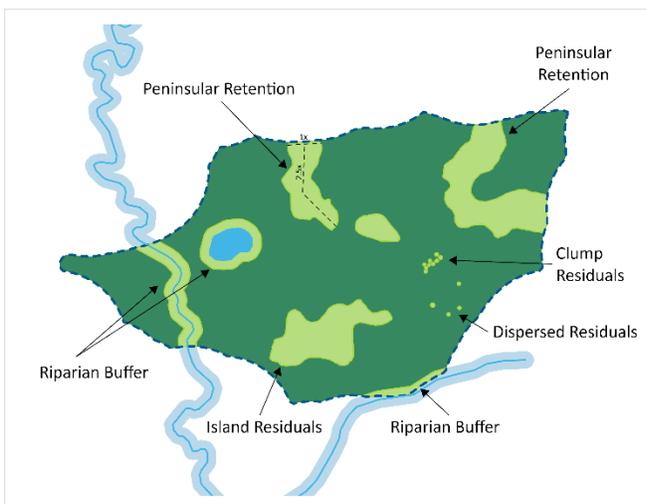
- (7) Should old and very old forest targets be unachievable in any periods of the 200-year planning horizon due to existing CRV, the plan author shall identify areas of mature forest that will be deferred from harvest to achieve old and very old forest targets over the planning horizon.
- (8) If the proportion of old and/or very old forest falls below the target level identified in the FMP as a result of management activities, the plan author shall identify equivalent (condition and species) areas within the MFLB to offset the change in representation of old and very old forest.
- (9) The plan author shall prepare and submit a digital map and associated spatial data showing old and very old forests to be deferred for the duration of the FMP and an updated digital map and associated spatial data if changes are made during the term of the FMP.

#### **Variable Green Tree Retention**

- 1-36** (1) For variable green tree retention:
- (a) the objective is to establish a similar representation of live trees surviving a wildfire event, therefore providing a variety of structure in regenerating forest stands that serve many ecological functions, such as habitat, shelter, connectivity, and a natural seed source; and
  - (b) the target is to support biodiversity by creating diverse landscapes, similar to how low, medium, and intense wildfires leave different amounts of live trees behind.
- (2) The retention area of live representative tree residuals for each harvest event shall be a minimum of 3% of the total harvested area and aim to fall within the range of 3 to 9% of the total harvested area within each harvest event. The average percentage of retention across all closed events shall be greater than or equal to 6% for each term of the plan (10 years). Retention area is calculated over the harvest event duration.
- (3) The plan author may propose a different retention target, based on the natural range of variation of these attributes, with supporting technical and scientific rationale. Forest

Service Branch will review proposed alternative approaches on technical and scientific merit and defensibility.

- (4) Tree retention shall meet the following criteria:
- (a) be comprised of the following arrangements (see Figure 4):
    - (i) interior retention that shall be:
      - (A) dispersed residuals composed of single trees or groups of up to four trees completely separated from the surrounding undisturbed forest, wetland, or openings by harvested ground;
      - (B) clump residuals, that shall be:
        - (I) a contiguous area of less than one hectare that includes more than four trees and is enclosed within a harvest area and separate from the surrounding undisturbed forests, wetlands, or openings; and
        - (II) diverse in size and shape;
      - (C) island residuals, that shall be:
        - (I) a contiguous area of at least one hectare in size that is completely enclosed within a harvest area and is separate from the surrounding undisturbed forests, wetlands, or openings; and
        - (II) diverse in size and shape; and
      - (D) peninsular retention, defined as undisturbed trees within the harvest area which are connected to a portion of the harvest event boundary, that:
        - (I) consists of retained trees extending into the harvest area where the residual length is at least 2.5 times the width of the residual edge that is common with the harvest area boundary; and
        - (II) may extend across the harvest area and connect with the opposite harvest area boundary;
    - (ii) treed riparian buffers as shown in Figure 4;
  - (b) be representative of the stand composition and tree species of the range of trees in the harvest event, which may also include trees growing on steep slopes within a harvest area or residual trees retained to protect understorey spruce; and
  - (c) fall within the landbase under the management of the licensee.



**Figure 4 Interior and Riparian Buffer Tree Retention Composition and Distribution Example**

- (5) Exceptions to the tree retention target, composition or distribution may be authorised for achievement of other objectives such as to address ecological considerations, forest health and social values. Such exceptions shall be reviewed by Forest Service Branch when assessing achievement of the targets for retention.

## Salvage Harvesting

### Information Note

Salvage areas are not used as modeling targets or constraints in the forest estate model. This section of the standard is applicable to forest operations, subsequent to the FMP approval.

- 1-37**
- (1) Salvage harvest activities of a natural disturbance event shall be planned to maintain a portion of the harvested area in an unsalvaged state.
  - (2) Salvage harvest events shall be subject to live tree retention criteria to promote ecological integrity of regenerating stands.
  - (3) A single contiguous area covering at least 20% of each disturbance event shall be identified and reserved from all harvesting activities, such that the area reserved from harvest shall be:
    - (a) free of roads, trails and skid trails; and
    - (b) be composed of tree species representative of merchantable timber burned or damaged.
  - (4) Burned or damaged timber shall be used where there are insufficient live residuals to meet tree retention targets.
  - (5) Residuals shall be left in clumps, islands and proximal retention, to address safety concerns.
  - (6) Upon approval by the Forest Service Branch, in an operating plan, alternate spatial arrangements may:
    - (a) be comprised of multiple discrete areas adding up to 20% of the disturbance area; and
    - (b) vary from tree residual targets, for reasons of forest health.
  - (7) All salvage activities shall occur within two operating years of the date on which the natural disturbance occurred, unless otherwise approved in an operating plan.

## FMP Volume 3 Requirements

### Deliverables

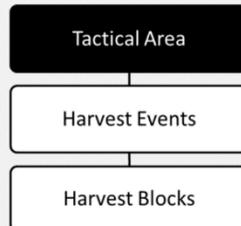
- 1-38**
- (1) The plan author shall submit FMP Volume 3 in a digital format, for review and approval by the minister.
  - (2) The FMP Volume 3 shall contain:
    - (a) title page;
    - (b) executive summary;
    - (c) table of contents;
    - (d) approval page (signatory page);
    - (e) tactical plan maps;
    - (f) harvest events; and
    - (g) FMP implementation strategies.

## Tactical Plan

- 1-39** (1) The plan author shall develop a tactical plan to which the licensee shall adhere during the term of the FMP, unless revisions to the tactical plan are required in accordance with section 1-52.
- (2) Subject to subsection (3), the tactical plan shall:
- (a) consist of a report that includes tables and tactical area maps;
  - (b) serve as a template for the implementation of the FMP and future operating plans;
  - (c) identify tactical areas for harvest, for the 20-year FMP such that blocking of the tactical plan is achieved through the manipulation and validation of the selected management strategy, enhanced by forest planners' knowledge of the land base;
  - (d) explain how the spatial sequence was created and how the sequence meets operability requirements, while considering wildfire and forest health risk management strategies set out in sections 1-45 and 1-46;
  - (e) describe for each planning unit:
    - (i) significant landscape features;
    - (ii) planned road construction and reclamation for class 1 and 2 roads;
    - (iii) special values (e.g. cultural, ecological, non-timber, and recreational); and
    - (iv) spatial concerns identified through the public engagement process; and
  - (f) provide information regarding the integration of the independent operators harvest activities.
- (3) The tactical plan maps shall include:
- (a) an overview map of the entire FMA area showing:
    - (i) delineation of the deferral areas for old and very old forest retention pursuant to subsection 1-35(5);
    - (ii) in the event that planning units where old and very old forest levels are below target levels, delineation of mature forest areas with desirable attributes including underrepresented tree species, interior forest, or connectivity, that will be deferred from harvest and allowed to develop into old forest; and
    - (iii) caribou habitat management areas or other habitat areas designated within a provincial range plan for species at risk;
  - (b) a series of tactical plan maps for each planning unit showing the following features:
    - (i) planned tactical areas for the 20-year FMP;
    - (ii) harvest events by decade one, decade two, or multi-decade;
    - (iii) merchantable stands by forest development type or approved species grouping, from the net productive land base;
    - (iv) lakes, streams and wetlands;
    - (v) permanent and partial exclusions, as defined in clause 1-31(2)(b);
    - (vi) other significant features including, but not limited to cabins and historic trails;
    - (vii) the planning unit boundary;
    - (viii) any relevant non-timber zones or boundaries, including:
      - (A) fire boundaries less than 10 years old;
      - (B) visually sensitive areas; and
      - (C) wildlife habitat and habitat features;
    - (ix) previously harvested areas and existing all-season roads (class 1, 2 and 3);
    - (x) planned roads, including class 1 and 2 roads, by decade one, decade two, or multi-decade; and
    - (xi) backlog NSR areas; and
  - (c) digital copies and associated geospatial data files.

### Information Note

Tactical areas are a communication tool for better defining long-term operations to the public and stakeholders. Tactical areas define where forestry operations will be broadly clustered on the landscape for the 20-year FMP. While it is expected that all operations will occur within tactical areas during the term of the plan, minor deviations may be permitted as described in Section 1-52. The diagram below illustrates the relationship between tactical area and harvest events.



### FMP Implementation Strategies

**1-40** The plan author shall:

- (a) provide a clear strategy on how the FMP will be implemented, including the purpose and role of the following:
  - (i) resources;
  - (ii) information systems;
  - (iii) certification systems;
  - (iv) environmental management systems;
  - (v) other supporting systems and programs;
  - (vi) annual performance tracking and reporting;
  - (vii) the AG;
  - (viii) future operating plans and their linkages to the tactical plan; and
- (b) include a statement indicating that during forest operations, the licensee will be adhering to:
  - (i) the provincial utilization standard set out in the Forest Operations Standard; or
  - (ii) an alternative utilization standard approved by the minister.

### Appointment of Management Implementation Team (MIT)

- 1-41** (1) Upon receiving ministerial approval for the FMP, the licensee shall form a management implementation team consisting of representatives from:
- (a) the licensee;
  - (b) the Forest Service Branch;
  - (c) other ministry branches; and
  - (d) the AG representative.
- (2) The licensee or a representative shall be appointed as chair.

### Development of Terms of Reference

**1-42** Upon approval of the FMP, the MIT shall develop terms of reference that shall:

- (a) describe the roles and responsibilities of the MIT members respecting:

- (i) participation at public meetings;
- (ii) review of operating plans for consistency with the tactical plan; and
- (iii) assessment of progress made on FMP registry commitments and VOITs;
- (b) establish an annual meeting schedule;
- (c) identify a schedule for submission of annual reports; and
- (d) be approved by Forest Service Branch.

### **FMP Registry**

**1-43** The licensee shall:

- (a) track and monitor progress made on all commitments established throughout the FMP;
- (b) establish an implementation schedule for all commitments and subsequent action items;
- (c) describe the manner of planned implementation of all action items; and
- (d) summarize all previous FMP and environmental assessment approval conditions and the links to the respective VOITs.

### **Tactical Plan Linkage to Operating Plans**

**1-44** The plan implementation strategy shall describe linkages between the tactical plan and operating plans.

### **Strategy for Wildfire Management**

#### **Information Note**

A Wildfire Prevention and Preparedness Best Management Practices document has been developed to assist industrial and commercial operators meet their legal obligations under *The Wildfire Act*. Refer to [Wildfire Prevention and Preparedness for Industrial and Commercial Operators](#).

The licensee will take the Forest Sector Competitiveness Committee (FSCC) Wildfire Subcommittee's input into consideration with respect to timber values and wildfire prevention and suppression priorities.

- 1-45** (1) The plan author shall summarize how he or she will work in conjunction with the Saskatchewan Public Safety Agency to meet provincial requirements for wildfire management within the licence area including:
- (a) identification of the licensee's commitments pertaining to wildfire management and the controls that shall be implemented over the term of the FMP;
  - (b) how wildfire management issues were considered and incorporated in the:
    - (i) development of VOITs;
    - (ii) formulation of the selected management strategy; and
    - (iii) development of the tactical plan; and
  - (c) fuel risk management for the licence area including:
    - (i) current wildfire risk levels for communities within the planning area;
    - (ii) application of treatments to assist in reducing wildfire risk to communities, and areas of high timber value and priority including, but not limited to:

- (A) special slash management (i.e. pile and burn) considerations when harvesting within five kilometres of communities; and
- (B) lower stocking standard or a forest stand conversion is part of the SGRs;
- (iii) harvest scheduling related to the accelerated harvest of areas of high value timber in close proximity to identified high wildfire risk areas; and
- (iv) working collaboratively with the Saskatchewan Public Safety Agency and key stakeholders to identify potential fuel breaks, fuel modification zones and fuel management techniques, for implementing:
  - (A) Community wildfire protection plans to reduce wildfire risk to communities; and
  - (B) fuel treatments on the borders of protected areas to facilitate preventive measures and modified suppression within these areas.
- (2) The plan author shall identify the updated timber values and priorities where different provincial wildfire suppression efforts may be applied.

### Strategy for Management of Forest Insect and Disease Disturbances

**1-46** (1) The plan author shall describe how planning and operational activities will be implemented for the respective management of the following forest insect and disease disturbance agents:

- (a) defoliators, including:
  - (i) eastern spruce budworm (*Choristoneura fumiferana*);
  - (ii) jack pine budworm (*Choristoneura pinus pinus*);
  - (iii) forest tent caterpillar (*Malacosoma disstria*);
  - (iv) large aspen tortrix (*Choristoneura conflictana*);
- (b) bark beetles, including:
  - (i) mountain pine beetle (*Dendroctonus ponderosae*);
  - (ii) spruce beetles (*Dendroctonus rufipennis*) and other bark beetles (*Ips spp.*);
- (c) woodboring insects, including:
  - (i) whitespotted sawyer (*Monochamus scutellatus*);
  - (ii) northeastern pine sawyer (*Monochamus notatus*);
  - (iii) ambrosia beetles (*Trypodendron lineatum*, *Trypodendron retusum*);
- (d) insects and diseases in regenerating forests, including:
  - (i) lodgepole pine dwarf mistletoe (*Arceuthobium americanum*);
  - (ii) terminal weevils including white pine weevil and lodgepole terminal weevil (*Pissodes strobi* and *Pissodes terminalis*);
  - (iii) armillaria root disease (*Armillaria Spp.*).

#### Information Note

Refer to the [Forest Pest Fact Sheets](#) found on Publications Saskatchewan for further details on forest insect and disease management.

The plan author only needs to address the aforementioned forest insects and disease species anticipated to pose risks to FMP activities.

- (2) The plan author shall summarize how he or she will work with the ministry to address forest health management within the licence area, which includes:

- (a) identifying the responses that shall be implemented over the term of the FMP;
- (b) reducing known forest health risks that may impact current and future wood supply within the planning area for:
  - (i) bark beetles, based on the Stand Susceptibility Index; and
  - (ii) defoliators, based on the frequency of disturbance within the licence area;

#### Information Note

Stand susceptibility index (SSI) is a measure of a stand's capacity to produce beetles in the event it is attacked. The index can be used to set priorities for preventative management to identify which stands, or groups of stands on a landscape, should receive management priority to reduce potential loss to the beetle and reduce the highest brood producing stands.

The susceptibility index for a given stand is based on four variables: relative abundance of susceptible pine basal area in the stand, age of dominant and co-dominant live pine, the density of the stand, and a climate suitability factor. Information on how SSI is calculated (per the Shore/Safranyik model\*) and other spatial data indicating the distribution of tree defoliators can be obtained by contacting the Forest Service Branch.

*\*Shore, T.L.; Riel, W.G.; Safranyik, L.; Fall, A. 2006. Decision support systems. Pages 193-230 in Safranyik, L, and WR Wilson (eds.). The mountain pine beetle: A synthesis of biology, management, and impacts on lodgepole pine. Natural Resources Canada, Canadian Forest Service, Pacific Forestry Centre, Victoria, British Columbia., 298 p.*

- (c) applying mitigative actions developed collaboratively with the ministry to reduce forest health risks, such as, but not limited to:
  - (i) slash management; and
  - (ii) harvest scheduling related to the accelerated harvest of areas of high value timber as per (2)(b); and
- (d) committing to the protection of research and long-term monitoring investments identified by the ministry.

#### Strategy for Management of Woodland Caribou Habitat

- 1-47** (1) The licensee shall develop and implement a management strategy that aligns with any approved woodland caribou range plan corresponding to the licence area.
- (2) Pursuant to subsection (1), the management strategy shall:
- (a) support the achievement of the woodland caribou range plan objectives using the best available information;
  - (b) include, but is not limited to, the following mitigation measures:
    - (i) identification of woodland caribou habitat and approved woodland caribou range plan strategies used to maintain, increase, or improve woodland caribou habitat (e.g. avoidance – Tier 1 and Tier 2 harvest deferrals);
    - (ii) harvest event planning;
    - (iii) seasonality of activities; and
    - (iv) identification of existing class 1, 2, and 3 roads or portions/sections of class 1, 2 and 3 roads that will be utilized during the 20-year FMP.
- (3) In areas without an approved woodland caribou range plan, the licensee shall develop an interim strategy for woodland caribou habitat that will be in effect until the provincial range plan is approved.

- (4) If needed, the licensee shall adapt the forest management plan, to meet objectives and targets of the corresponding woodland caribou range plan within the licence area.

### **Management Challenges on the Licence Area**

- 1-48** (1) The plan author shall identify the management challenges associated with implementing the FMP, including but not limited to:
- (a) administration;
  - (b) achievement of VOITs;
  - (c) non-forest industry related resource-based interests;
  - (d) community interests;
  - (e) Aboriginal interests;
  - (f) independent operators interests; and
  - (g) natural disturbances.
- (2) The plan author shall propose management actions within its control, mitigation or adaptations measures that address each of the identified management challenges.

### **Vulnerability Assessment to Address Climate Change**

- 1-49** To reduce the negative influences of climate change, the plan author shall:
- (a) identify existing and potential impacts of major stressors on forest management activities and ecosystem services including but not limited to:
    - (i) wildfire;
    - (ii) invasive species;
    - (iii) extreme weather events;
    - (iv) temperature;
    - (v) precipitation; and
    - (vi) reforestation;
  - (b) assess the potential impact of the stressors on achieving the targets associated with the VOITs identified in the plan;
  - (c) develop adaptation and mitigation strategies to minimize potential negative impacts;
  - (d) monitor predicted impacts and identify a threshold for implementation of strategies; and
  - (e) collaborate with the ministry and other partners to establish field trials as appropriate with respect to mitigating and adapting to climate change impacts with the intent of developing best practices.

### **Integration of Forest Management Activities with Non-timber Uses**

- 1-50** (1) The plan author shall describe the approaches and processes that will be used to integrate forest management activities with non-timber values and uses in the licence area.
- (2) The plan author shall describe how non-timber values and resources will be incorporated into the operating plans.
  - (3) The plan author shall describe how the [Saskatchewan Activity Restriction Guidelines for Sensitive Species](#) will be used to avoid key habitats of sensitive species during sensitive periods.
  - (4) Non-timber values and resources may include, but are not limited to:
    - (a) high-value non-timber forest products;
    - (b) visual resources;
    - (c) livestock grazing;

- (d) recreation areas;
  - (e) watersheds;
  - (f) lakes, streams and wetlands;
  - (g) identified wildlife habitat including threatened and endangered species, and species at risk, pursuant to SARA;
  - (h) archeological, cultural and heritage resources;
  - (i) traditional use areas;
  - (j) outfitting and tourism;
  - (k) trapping;
  - (l) fishing;
  - (m) hunting;
  - (n) oil and gas exploration;
  - (o) oil and gas development;
  - (p) mineral exploration;
  - (q) mining; and
  - (r) agriculture.
- (5) For licence areas where higher-level plans including land use or caribou range plans have not been prepared or approved, the FMP work plan shall outline a process to identify strategic land and resource management issues.
  - (6) The plan author shall include a reference to relevant higher-level plans and include a description of the manner in which proposed FMP strategies and processes will adopt or link to the plans.
  - (7) The plan author shall describe the measures which will be undertaken to address potential management issues relating to the conservation of non-timber values and resources on the licence area including:
    - (a) forest certification processes;
    - (b) environmental management systems;
    - (c) standard operating procedures; and
    - (d) arrangements with stakeholder groups describing:
      - (i) courses of action which the plan author has agreed to with specific stakeholder groups; and
      - (ii) how the arrangements may benefit the implementation of the FMP and the management of the non-timber values and resources.

### **Amendments to the FMP**

- 1-51** (1) Amendments to the FMP shall be submitted to Forest Service Branch for approval when:
- (a) deviations to the tactical plan are required; or
  - (b) the licensee seeks approval to deviate from approved utilization specifications.
- (2) When submitting an amendment for approval, supporting information and maps shall be provided in a manner and format consistent with this standard.
- (3) The plan author shall maintain an amendment log including a record of associated public engagement activities for the duration of the FMP.

### **Revisions to the Tactical Plan**

- 1-52** (1) In cases where deviation from the tactical plan is necessary, the licensee shall discuss the implications of the deviations to the VOITS and other sustainability indicators, and periodic timber supply.
- (2) If the licensee proposes deviations that are:

- (a) within the acceptable allowance of up to 15% by harvested area on the licence within the term of the plan, revisions shall be submitted for approval in an operating plan; or
- (b) in excess of the deviation allowance of 15% by harvested area on the licence within the term of the plan, the tactical plan shall be revised in accordance with subsection (3), unless otherwise approved.

**Information Note**

Deviations resulting from independent operations will not be held against the licensee’s targets.

- (3) When revisions to the tactical plan are required as per section (2)(b), the licensee shall:
  - (a) provide a rationale;
  - (b) identify in a table and maps:
    - (i) blocks that were not affected by the revision and maintained in the amended plan;
    - (ii) blocks that have been harvested since the implementation of the tactical plan; and
    - (iii) previously unidentified blocks from:
      - (A) salvage operations;
      - (B) incidental harvesting; and
      - (C) silviculture treatments;
  - (c) describe all variations from the original tactical plan with respect to:
    - (i) primary road development;
    - (ii) road access management;
    - (iii) recreation features;
    - (iv) wildfire risk management for the protection of communities;
    - (v) effects on watersheds and riparian areas;
    - (vi) wildlife including species at risk;
    - (vii) forest health;
    - (viii) visual concerns;
    - (ix) relationship to approved higher-level plans;
    - (x) interaction with other industrial users;
    - (xi) integration of the independent operators;
    - (xii) harvest scheduling;
    - (xiii) silviculture activities; and
    - (xiv) other, as deemed applicable by the licensee or the Forest Service Branch;
  - (d) provide a record of public engagement sessions and Indigenous community information sessions conducted, including feedback received and how the amended tactical plan has addressed concerns raised; and
  - (e) provide replacement tables, maps and GIS files for all affected planning units.
- (4) The current tactical plan shall be archived and replaced with the approved revised tactical plan.

**Deviation to Utilization Specifications**

**1-53** When the licensee seeks to deviate from the approved utilization specifications, they shall seek approval for the deviation in an operating plan.

## Catastrophic Natural Disturbance Events

**1-54** If a catastrophic event or series of natural disturbance events causes the re-planning threshold to be exceeded, as specified in the modelling assumptions report, the licensee shall:

- (a) update the current forest condition;
- (b) update the planning inventory;
- (c) update the forest estate model;
- (d) select an updated management strategy; and
- (e) revise the tactical plan.

## Annual Reporting

- 1-55** (1) The licensee shall engage the MIT when establishing an outline of the process to be used for preparation and digital submission, the details of the annual report template and the submission date for the draft and final versions of the annual report.
- (2) The annual report shall address the following FMP content areas:
- (a) VOITs tracking and monitoring including:
    - (i) a cumulative assessment of targets from the start of the FMP;

### Information Note

For silviculture related indicators and targets, reporting of landscape level analysis will include all harvest areas where the licensee has historical responsibility. The licensee will work with the MIT where gaps in data exist (e.g. inventory, treatment information, survey).

- (ii) a description of the mechanisms employed in the monitoring process, which may include:
    - (A) environmental management systems (EMS);
    - (B) forest certification processes;
    - (C) GIS and associated digital data;
    - (D) databases for attributes associated with the indicators;
    - (E) public consultation records, including an updated issues and concerns table; and
    - (F) independent forest audit records;
  - (iii) an assessment of progress for the targets set through VOITs;
  - (iv) an explanation of any deviations from a target, with reasons for, and analysis supporting the deviations; and
  - (v) submission of digital data supporting the annual report, including GIS files, tables, databases and maps;
- (b) the FMP registry including progress and updates on the status of each approval condition and commitment against the provided timeframe;
- (c) operational implementation of the FMP including:
- (i) reporting of non-compliances; and
  - (ii) associated actions taken to address non-compliances.

## Glossary

### **Current Range of Variation (CRV)**

This term describes the range of conditions currently occurring in an ecosystem. Current range of variation is the assessed present state of the forest, encompassing the influence of natural disturbance (wildfire, windstorms, insect outbreaks) and the presence of human activities (e.g. harvesting and other activities). Variation of CRV from NRV is dependent upon the scale of natural and anthropogenic disturbance and duration of this disturbance on the land base.

### **Disturbance Event**

Disturbance events are typically those that occurred naturally, such as wildfires (including human-caused), wind, flooding, insect outbreaks, disease, or other natural causes. Disturbance events may comprise one or more patches, combined into an event of single causative origin.

### **Harvest Event**

A harvest event plan shows the proposed long-term plan for harvest operations in a specific area. Harvest events are comprised of one or more proposed, approved or completed harvest blocks, together with undisturbed forest within and between each harvest block. Harvest blocks that are within an identified distance between 350 and 500 metres of each other and that fall within the same event time period will be reported as part of the same event unless they have been separated and approved by the Forest Service Branch at the FMP or operating plan level. Additional operational events can be defined and approved at the Operating Plan level.

### **Forest Land Base (FLB)**

That part of the **GLB** that does currently or will in the foreseeable future support forests (trees established within 10 years following disturbance, as per the Food and Agriculture Organization of the United Nations guidelines). Calculated as **GLB** less **NFLB**.

### **Gross Land Base (GLB)**

The entire (gross) timber supply area land base.

### **Improved seed**

Improved seeds are genetically superior seeds resulting from the breeding of selected high-quality performance trees from wild stands (located from the geographic area where the seedlings will be planted). Genetic traits such as disease resistance, tree height or branch straightness are selected in the parent trees and then used to produce the improved seedlings. Improved seeds are cultivated in seed orchards or tree nurseries. Seed or tree improvement does not involve any genetic modification, or genetic engineering, that results in genetically modified organisms. Genetic modification is not occurring in Saskatchewan.

### **Managed Forest Land Base (MFLB)**

That part of the FLB not within permanent exclusions. Calculated as FLB less NMFLB.

**Natural Range of Variation (NRV)**

The estimated natural ecological conditions before anthropogenic disturbances, and the spatial and temporal variation in these conditions.

**Non-Forest Land Base (NFLB)**

That part of the GLB that does not currently and will not in the next 10 years support forests. E.g. water, non-forested, roads, rail and corridors.

**Non-Managed Forest Land Base (NMFLB)**

That part of FLB within permanent exclusions. Calculated as FLB less permanent exclusions. E.g. communities, reserves, dispositions, parks and representative areas.

**Non-Timber Harvest Land Base (NTHLB)**

That part of the MFLB not included in the PFLB, or that part of the PFLB excluded due to spatial considerations such as steep slopes, isolated timber and/or islands, riparian areas, or planned retention.

**Productive Forest Land Base (PFLB)**

That part of the MFLB which contains stands of interest for timber production, as defined on the basis of species proportions, moisture regimes, and site productivity considerations.

**Timber Harvest Land Base (THLB)**

That part of the MFLB not excluded as NTHLB. THLB is the primary determinant of AAC.

**Wild seed**

Seed that is collected from wild forest stands from the geographic area where the seedlings will be planted.

## List of Abbreviations and Acronyms

AAC	annual allowable cut	MIT	management implementation team
ABTSL	area-based term supply licence	NFLB	non-forest land base
Act	<i>The Forest Resources Management Act</i>	NFP	natural forest pattern
AG	advisory group	NMFLB	non-managed forest land base
code	Saskatchewan Environmental Code	NRV	natural range of variation
CRV	current range of variation	NSR	not sufficiently regenerated
CSG	cover species group	NTHLB	non-timber harvest land base
EMS	environmental management system	PFLB	productive forest land base
FLB	forest land base	S	softwood
FMA	forest management agreement	SARA	<i>Species At Risk Act</i>
FMP	forest management plan	SGR	silviculture ground rules
FSCC	forest sector competitiveness committee	SH	mixedwood – softwood leading
FTG	free to grow	SPSA	Saskatchewan Public Safety Agency
GLB	gross land base	SR	sufficiently regenerated
H	hardwood	SSI	stand susceptibility index
HS	mixedwood – hardwood leading	THLB	timber harvest land base
LRSY	long-run sustainable yield	TSL	term supply licence
MFLB	managed forest land base	VOIT	values, objectives, indicators and targets

## Appendix

Table A1 Format to present short-term and long-term licensee-specific AAC

TIMBER VOLUME (m <sup>3</sup> / year)							
SOFTWOOD						HARDWOOD (≥8cm)	TOTAL
Estimated Saw Log (≥10cm)	Estimated Pulp Logs				Total		
	Estimated Saw Log Defect	Saw Log Tops (8cm-10cm)	Discrete Pulp Stands	Total			

*Short term = first 20 years*