



**Sundre Forest Products Ltd.
Timber Harvest Planning and
Operating Ground Rules**

2015

SUNDRE FOREST PRODUCTS LTD. FMA

OPERATING GROUND RULES

**Sundre Forest Products
Ltd. FMA Operating
Ground Rules**

**ALBERTA
ENVIRONMENT and
SUSTAINABLE
RESOURCE
DEVELOPMENT**

ENDORSEMENTS

**The Sundre Forest Products Ltd FMA Operating Ground Rules,
having been prepared in accordance with Section 11 (1) of FMA
9200030, and hereby endorsed this ___ day of _____, 2015.
The Executive Director of Forest Management Branch has also
determined these ground rules will apply to FMU R11.**

Sundre Forest Products Ltd.

HER MAJESTY THE QUEEN in right of Alberta as
represented by the Minister of Environment and
Sustainable Resource Development

Per:

Original Signed

Per:

Original Signed

Tom Daniels

Darren Tapp

(print name)

(print name)

Forestry Superintendent

Executive Director

(title)

(title)

Sundre Forest Products Ground Rules
Revisions from 2009 to 2015
(Effective Date: May 1, 2015)

Ground Rule Number	2009 Version of the Ground Rule	2015 Version of the Ground Rule
General	Some edits were made outside of the joint reviews in 2015, that included deletion of word(s), correction of spelling & grammar, changes to bolded text, etc., that did not change the intent, meaning or requirements of the OGR's, but rather to provide clarification. These changes are not documented in this table.	
1.0 Scope	Added	The Delegated Authority (Alberta) has the authority to approve Annual Operating Plans and may also waive or amend the application of specific ground rules in unusual or special circumstances. However, waivers must be completed in writing and conform to all applicable provincial legislation or statutes.
3.2	The GDP shall also include details regarding fish and wildlife issues within the planning area.	Deleted
3.2.2.1	Added	It is the responsibility of the operator to ensure that they do not exceed the allowable cut level as specified in their tenure document
3.2.4	In the GDP, the forest operator shall submit a table tracking the status of all roads over two years old until they are reclaimed.	In the GDP, the forest operator shall submit a table tracking the status of all planned DLO roads.
3.2.5	1. c) road corridors showing planning and construction time lines;	1. c) road corridors showing planning and construction time lines for DLO roads;
3.2.5	1. d) if not otherwise addressed, roads to be inspected, and all outstanding and anticipated reclamation work related to road and stream crossings;	Deleted
3.2.5	1. e) a brief description of potential issues;	1. d) a brief description of issues;
3.2.5	2. b) proposed haul routes and five year projection of road corridors;	2. b) proposed roads;
3.2.5	2. d) for the next two years and if not otherwise addressed in the AOP, the general location of routes, and dispositions where reclamation work will be undertaken;	2. d) for the next two years and if not otherwise addressed in the AOP, the general location of routes, and dispositions where reclamation work will be undertaken;

3.2.5	2. e) at a time agreed to by Alberta, shape files of all non-reclaimed roads and as-built harvest boundaries from the previous year's harvest. These files may be provided elsewhere with approval from Alberta.	Moved to 3.4.4
3.3 Discussion	The primary components of an FHP are a map and report that clearly show and document the harvest area boundaries, roads and water crossings for the area of the FHP. The laid out harvest and road design shall be valid for five years from the time of approval, unless issues deemed significant by Alberta arise during this period. It is expected that there may be discussion with Alberta before the FHP is submitted. The companies may be submitting a compartment focus (CF) and preliminary harvest plan (PHP) to Alberta for review and appraisal. It is expected that input from Alberta will take place at the CF and PHP stage of planning and only issues that were not known at the time of the CF and PHP will be considered at the FHP stage.	The primary components of an FHP are a map and report that clearly show and document the harvest area boundaries, roads and water crossings for the area of the FHP. The laid out harvest and road design shall be valid for five years from the time of approval, unless issues deemed significant by Alberta arise during this period. It is expected that there may be discussion with Alberta before the FHP is submitted; a Compartment Focus (CF) and/or Preliminary Harvest Plan (PHP) may be submitted to Alberta for review and appraisal.
3.3.8	d) list of watercourse crossing location and watercourse crossing structure types;	d) list of watercourse crossing locations for channelled watercourse crossings;
3.3.8	f) description and location of sensitive wildlife sites as per section 7.7.3.2.	f) description and location of sensitive wildlife sites as per section 7.7.4.2
3.3.10	a) harvest area comments shall be included on the harvest area form that depicts the laid-out harvest area boundary and road;	a) harvest area comments shall be included on the block map form that depicts the laid-out block boundary and road;
3.3.10	b) layout bordering and encompassing riparian management zones when different than the standards in section 6.0;	b) layout bordering and encompassing riparian management zones when different than the standards in section 6.0; either map or describe variance
3.3.10	h) need for a detailed harvest area plan (see section 3.4.10);	h) need for a detailed harvest area plan (see section 3.3.11);

3.3.10	i) important wildlife sites as defined in section 7.7.3 (this information shall be made available for resource planning purposes only through Fish and Wildlife);	i) important wildlife sites as defined in section 7.7.4 (this information shall be made available for resource planning purposes only through Fish and Wildlife);
3.3.10	k) soil protection measures for unfrozen ground timber operations as per 9.0.2;	k) soil protection measures for unfrozen ground timber operations as per 9.2;
3.3.10	l) harvest areas that contain sensitive wildlife areas;	l) harvest areas within wildlife zones;
3.4.1	The AOP has been submitted by March 15 unless otherwise agreed to by Alberta. See Timber Management Regulation (TMR) 98 - Alberta shall respond within 30 days. The AOP shall be reviewed by Alberta for approval.	The AOP has been submitted by May 15 unless otherwise agreed to by Alberta. - Alberta shall respond within 30 days. The AOP shall be reviewed by Alberta for approval.
3.4.4	a) a map showing all blocks, roads and crossings authorized by that AOP;	a) The map(s) referred to in 3.3.7 and requested shape files (or other digital format approved by Alberta) of approved FHP harvest areas, inter block roads and or points of watercourse crossings locations;
3.4.4	c) I. list of areas proposed for harvest (including area and volume by species or species group, with totals)	c) I. list of blocks proposed for harvest (including area and volume by conifer or deciduous, with totals)
3.4.4	Added	Updated requirements listed in Sections: 3.4.4 c) II. i. 3.4.4 c) II. ii. 3.4.4 c) III. i. 3.4.4 c) III. ii. 3.4.4 c) IV. i. 3.4.4 c) IV. ii.
3.4.4	IV. Debris Disposal	VI. debris disposal methodology;
3.4.5	All amendments to harvest plans must be justified and submitted to Alberta in writing. RFP validation of all amendments is required. Any changes must be incorporated into the as-built plan. Unless otherwise agreed to with Alberta, the following applies.	All amendments to harvest plans must be justified and submitted to Alberta in writing. RFP validation of all amendments is required. Any changes must be incorporated into the as-built plan and/or the annual silviculture report. Unless otherwise agreed to with Alberta, the following

		applies to the FMA Holder (Regional offices will determine if embedded operators can follow this amendment procedure).
3.4.5.1	Changes meeting the following criteria are considered 'Notifications, Minor Amendments or Major Amendments'. Notifications and minor amendments shall not adversely affect buffers established for the protection of riparian areas, wildlife sites, historical resources, or aesthetic values:	Changes meeting the following criteria are considered 'Notifications or Minor Amendments'. Notifications and minor amendments shall not adversely affect buffers established for the protection of riparian areas, wildlife sites, historical resources, or aesthetic values:
3.4.5.1	Updated	See Section 3.4.5.1 for updates to amendment definitions and requirements.
4.1	Deferral - Those stands or portions thereof removed from the 10 year SHS after its approval, which are intended to be harvested at a later date. Deferrals are those stands or portions of which are operable, not isolated, and should be available for future harvest.	Deferral - Those stands or portions thereof removed from the 10 year SHS after its approval, which are intended to be harvested at a later date. Deferrals are those stands or portions of which are operable, not isolated, and should be available for future harvest. Only deferrals of 1 ha and greater will be classified as variance and reported in the FHP and GDP.
Note 4	Added	Note 4: Deferrals, deletions and additions < 1ha shown on the map in 4.1.1 are not required to be included in these summary tables unless otherwise agreed to.
4.2.1	Coniferous and Deciduous Utilization Standards references updated	See Section 4.2.1
4.2.5	All trees/pieces used in the construction of crossing structures shall be scattered or piled along the ROW or in the harvest area, but not in the watercourse.	All trees/pieces used in the construction of crossing structures shall be scattered or piled along the ROW for erosion control or in the harvest area, but not in the watercourse.
4.2.6	Added	Company processing practices cannot create an unmerchantable piece from a merchantable tree.
5.2.1 5.2.3 5.3.1 5.5	Replaced "FHP" with "harvest plan".	See referenced Sections
5.4.1	The forest operator shall conduct all operations in accordance to the Grazing Timber Integration Manual.	The forest operator shall conduct all operations in accordance to the Grazing Timber Integration Manual and Directive SD 2011-03.

5.4.2	The forest operator has ensured that timber operations do not negatively impact the range management of the grazing disposition. Examples of these impacts include: damage or disruption to range improvements, infrastructure, roads, and bridges (e.g., fencing, water developments). The forest operator is responsible to repair and/or replace any damage to these improvements and infrastructure.	Deleted
6.0.4	Riparian protection areas shall be established as in Table 2, Standards and Guidelines for Operating beside Watercourses. Where uncertainty exists on the classification of the watercourse, the watercourse protection area shall be that required by the higher class of watercourse, unless otherwise agreed to by Alberta.	Riparian protection areas shall be established as in Table 2, Standards and Guidelines for Operating beside Watercourses unless otherwise approved by Alberta. Where uncertainty exists on the classification of the watercourse, the watercourse protection area shall be that required by the higher class of watercourse, unless otherwise agreed to by Alberta.
6.0.6	Variations from the standards in Table 2 must demonstrate that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta prior to being considered for approval.	Variations from the stated allowable standards in Table 2 must provide rationale that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta prior to being considered for approval.
Table 2 Class 'A' Waterbodies (Roads, Landings, Decking and Bared Areas)	Not permitted within 100 m of high water mark. Any existing roads may be maintained at present classification standards. Any proposed watercourse crossings within 2 km upstream must be specifically approved in the AOP	Not permitted within 100 m of high water mark of the mapped Class A unless approved in the AOP. Any existing roads may be maintained at present classification standards. Any proposed watercourse crossings within 2 km upstream must be temporary type 1 crossings as defined in the Code of Practice for Watercourse Crossings and must be specifically approved in the AOP.
Table 2 Class 'A' Waterbodies (Watercourse Protection Areas)	No disturbance or removal of timber within 100 m of the high water mark;	No disturbance or removal of timber within 100 m of the high water mark of the main stem of the Class A unless specifically approved in the AOP;
Table 2 Class 'B' Waterbodies (Roads, Landings, Decking and Bared Areas)	Not permitted within 60 m of high water mark. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 500 m upstream must be specifically approved in the AOP	Not permitted within 60 m of high water mark of the mapped Class B unless approved in the AOP. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 2k m upstream of the mapped watercourse shall be in compliance to section 9(1) (B) of the Code of Practice for Watercourse Crossings and must be specifically approved in the AOP.
Table 2 Class 'B' Waterbodies (Watercourse Protection Areas)	No disturbance or removal of timber within the appropriate riparian area specified by stream type unless specifically approved in the AOP;	No disturbance or removal of timber within the appropriate riparian area specified by stream type in Table 2 of the OGRs unless specifically approved in the AOP;

Table 2 Lakes (little or no recreation, waterfowl or sportfish potential)	On lakes exceeding 4 ha in area, no disturbance of timber within 100 m of high water mark except where specifically approved in FHP. Where approval is granted to remove timber within the 100 m zone, no timber shall be removed within 30 m of the high water mark.	No disturbance or removal of timber within 100 m of the high water mark except where specifically approved by Alberta. Removal of timber within 30 m of the high water mark is prohibited unless approved by Alberta.
7.3.3	a) not be conducted during the fire season, unless otherwise approved in the Fire Control Plan in the AOP;	a) not be conducted during the fire season, unless otherwise approved by Alberta through a burning permit;
7.4.12	The area of laid out retention patches shall be reported in the FHP.	The area of laid out retention patches shall be either shown on the map or reported in the planning process.
7.7.2.1	Companies shall use the grizzly bear models at a grizzly bear watershed unit (GBWU) level to guide road location and planning in core and secondary grizzly bear habitat with the objective being to achieve the results in one through three below, or as otherwise directed by Alberta: - Access roads and inter block roads are what would be run through the model.	If specifically requested by Alberta as per 3.1, a CA must be completed that addresses the following issues within identified Grizzly Bear areas:
7.7.3.1	Consultation with the regional biologist has taken place during development of the FHP to discuss options for accessing key ungulate winter range that have been identified on the wildlife referral maps.	Deleted
7.7.3	Updated	Key Wildlife and Biodiversity Zones
7.7.5.1	The company and Alberta shall work jointly to develop a sheep and goat protection plan highlighting mitigation measures required during forest operations and areas for habitat improvement.	The company and Alberta shall work jointly to develop a sheep and goat protection plan highlighting mitigation measures required during forest planning and areas for habitat improvement. a) Temporary access shall be used unless approval given for DLO access through a larger access process. Access restrictions shall be in place between operation and silviculture and maintained until the road is reclaimed.
8.2.2	Updated	Requirements for Reforestation Program
8.3.4	Added	Site preparation creating linear disturbance patterns, shall be oriented to minimize channelling of water downslope.
9.3	Where an approved silvicultural strategy does not exist for reforestation of disturbed soil, the total area covered by temporary roads, bared landing areas, and displaced soil created by timber harvesting operations shall not exceed five percent of each harvest area without prior approval of Alberta. Disturbance is measured using length x average	Where an approved silvicultural strategy does not exist for reforestation of disturbed soil, the total area covered by temporary roads, bared landing areas, and displaced soil created by timber harvesting operations shall not exceed five percent of each harvest area without prior approval of Alberta.

	width.	Disturbance is measured using length x average width. Blocks less than 7 ha or narrow blocks may exceed five percent with notification and reporting on the as built plan.
9.8	Site preparation creating linear disturbance patterns, shall be oriented to minimize channelling of water downslope.	Moved to 8.3.4
11.3.2.4	All borrow pits required off the ROW must be authorized by Alberta.	All borrow pits required off the ROW must be authorized by Alberta as per reference document <i>PLAR Approvals and Authorizations Procedures</i> , and/or applicable PLA/PLAR Directives.
11.3.2.6	Added	Use of sand and gravel from within the ROW can only be used for company roads directly connected to that ROW. The approval for this is the AOP
11.3.4.4	On dispositions issued pursuant to the Public Lands Act, all borrow and gravel pits no longer required must be reclaimed (re-contoured to stable slopes and re-vegetated) and require a Reclamation Certificate unless approval has been given to allow water to fill the pit for wildlife or wildfire purposes.	On dispositions issued pursuant to the Public Lands Act, all borrow and gravel pits no longer required must be reclaimed as per conditions of issued disposition.
11.3.4.6	a) Watercourse crossing and drainage structures are removed, and stream banks and approaches stabilized.	a) Watercourse crossing and drainage structures that have a risk of erosion or failure are removed, and stream banks and approaches reclaimed. Rollback with large woody debris on each side of the crossing to deter OHV use and minimize sedimentation.
11.5.1	Any facility or camp that shall be in place for more than twelve consecutive months requires an appropriate disposition under the Public Lands Act. Temporary field authorities (TFAs) are required for camps to be in place less than twelve consecutive months.	Any facility or camp that shall be in place for more than twelve consecutive months requires an appropriate disposition under the Public Lands Act. Temporary field authorities (TFAs) are required for camps that meet the criteria referenced in the document <i>PLAR Industrial and Commercial Work Camps on Public Land Directive</i> (and/or applicable PLA/PLAR policies).
11.5.4	Added	Temporary fuel storage sites shall not be located within 100 m of any flowing watercourse.
12.0.4	Added	12.0.4 As built plan (includes digital shape files of harvest boundaries, road location, and watercourse crossing location and type) from the previous year's harvest shall be submitted at the end of the timber year. The as built shall include disposition number, opening number, block number, block area, and skid clearance date.
Glossary	Added – Delegated Authority	The ESRD personnel located at the Regional or Area level charged with supervision of all forest management activities in a defined Region or Area. It can also mean someone who is authorized to approve an AOP.

Glossary		Deleted – Forestry Program Manager
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Sundre Forest Products Planning and Operating Ground Rules

1.0 GROUND RULE SCOPE

Ground rules are the practices used to plan and conduct timber harvesting operations. They put into practice decisions made in the Forest Management Plan (FMP) and other higher level plans such as Integrated Resource Plans (IRP). In the event that these strategic plans do not exist, the ground rules shall establish practices that minimize the chance of negative impacts from roads, timber harvesting and forest management operations and activities. Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act and Migratory Birds Convention Act. The proponent may require advice and approvals of the federal agencies (Department of Fisheries and Oceans, Environment Canada) regarding federal legislation requirements.

Authorization of the Annual Operating Plan (AOP) does not constitute waiver or exemption from the ground rules, nor is authorization of the AOP verification of compliance with the ground rules.

The Delegated Authority (Alberta) has the authority to approve Annual Operating Plans and may also waive or amend the application of specific ground rules in unusual or special circumstances. However, waivers must be completed in writing and conform to all applicable provincial legislation or statutes.

1.1 REGULAR REVIEWS

The intent is to have an annual review of ground rules if requested by either forest disposition holders or Alberta. This is not meant to be a complete redevelopment but rather an opportunity to fine-tune the ground rules. It is expected that regular reviews will allow participants to plan revisions more systematically and to correct any inconsistencies or problems. It will also create the ability to regularly consider modifications that reflect the best and most current knowledge and tools available.

2.0 THE TOPICS

This annex provides a list of topics that must be addressed in all ground rules. Each topic includes a purpose, discussion, and ground rule heading. All ground rules shall be written following this format.

PURPOSE

A statement of what the topic is designed to accomplish.

DISCUSSION

Include background information, research knowledge, and reasons for the concern. The discussion shall focus on why a ground rule is needed. Alternative actions or solutions could also be discussed here.

GROUND RULES

These are definitive statements of the desired results to be achieved and a clear indication of what is expected. **The ground rules shall be relevant, measurable, understandable and achievable.** A summary of the ground rules constitutes a checklist necessary for Regulated Forestry Professional (RFP) validation.

3.0 OPERATIONAL PLANNING

PLANNING PROCESS

PURPOSE

To establish plans that minimize the chance of negative impacts from roads, timber harvesting and forest management operations including meeting the existing and evolving strategies and objectives from the FMP development process. Where applicable, these strategies and objectives will be documented in the CA.

DISCUSSION

The planning process includes five main components:

1. **Approved Forest Management Plan (FMP)**
 - **Pine Strategy Approved in 2008.**
 - **Spatial Harvest Analysis (SHS) from 2009 – 2011 and SHS for 2011 – 2015 when the new FMP is due;**
 - **Approved Long Term Road Network.**
2. **Compartment Assessment (CA)** – A CA shall be required when information or major issues are identified that in Alberta’s opinion, have not been addressed in the FMP. In the event that the SHS is deemed by Alberta to be inappropriate due to a significant change in circumstances since the approval of the FMP, a compartment assessment describing current issues, shall be required (see section 3.1).
3. **General Development Plan (GDP)** - The GDP gives a comprehensive description of a forest operator's proposed harvest strategy, road building plans for a five year period, and reclamation operations for a two year period, and includes all licences and permits. The GDP is used to guide integration of activities (see section 3.2).
4. **Forest Harvest Plan (FHP)** – The FHP is a map and associated report describing the laid out harvest plan (see section 3.3).
5. **Annual Operating Plan (AOP)** – The AOP describes operations in detail through a series of components that may be submitted together or as individual submissions on a schedule approved by Alberta:
 - Operating Schedule and Timber Production
 - Applicable FHPs
 - GDP
 - CAs as required
 - Reforestation Program
 - Fire Control Plan
 - Road Plan(see section 3.4).

3.1 COMPARTMENT ASSESSMENT (CA)

PURPOSE

To address significant issues that have arisen since the approval of the FMP.

DISCUSSION

It is recognized that circumstances change over time and it is possible that the SHS approved in the FMP may prove to be inappropriate. Where Alberta deems it necessary, a CA shall be completed to adjust the operational plan for the area. CAs are necessary when major new issues or information that have been identified since FMP approval make the SHS inappropriate (e.g., forest fire, insect or disease, species of special management concern, a major change in land use direction or an unacceptable variance of >20% of the SHS/compartments/decade as determined by the area manager and the manager of Forest Management Branch (FMB)). The CA shall describe how the new issues will be incorporated into the FHP. In completing the CA, operators must consult in a meaningful way with affected stakeholders and strive to reach general agreement on issues. The CA provides an opportunity to reconsider management strategies at the time of operational planning if warranted.

GROUND RULES

- 3.1.1 After consultation with the company, Alberta shall decide on the area for which the compartment assessment is required and the requirements of the CA.**
- 3.1.2 If a CA is required, the operator must receive Alberta's approval of the CA prior to the approval of a FHP.**
- 3.1.3 A CA is considered current if it has been approved by Alberta and the FHP is submitted to Alberta within three years of approval.**
- 3.1.4 Unless otherwise approved by Alberta, variance exceeding 20%, shall have an approved CA prior to receiving approval for the FHP.**

3.2 GENERAL DEVELOPMENT PLAN (GDP)

PURPOSE

To provide a projection of activities for the next five years to:

- a) guide the integration of activities;
- b) schedule timber disposition administration activities;
- c) predict cut control status;
- d) co-ordinate the development and reclamation of roads.

DISCUSSION

The primary components of the GDP include a forecast of the areas scheduled for harvest for a five year period, a summary of variance from the SHS by compartment for existing FHPs and long-term road plans outlined in the FMP. The GDP must also include the current status and forecast of the respective annual allowable cuts (AACs) and cut control period for each of the operators within the planning area. This could be either a joint submission by all operators or separate submissions containing consistent information between operators.

Consultation of the GDP with First Nations is a requirement of Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.

GROUND RULES

3.2.1 The GDP shall be submitted to Alberta by May 1 unless otherwise agreed to by Alberta.

Alberta shall respond within 30 days. The GDP shall be approved subject to an appraisal by Alberta.

3.2.2 The GDP describes volume supply by areas, road standards and construction and reclamation schedules.

The plan is a notification to Alberta of proposed activities and exceptions to guide future regulatory activities.

3.2.2.1 Other forest operators affected by the GDP agree in writing to the GDP prior to approval (see section 5.1.1). It is the responsibility of the operator to ensure that they do not exceed the allowable cut level as specified in their tenure document.

3.2.3 Significant GDP revisions shall be submitted for approval.

A revision is required where the change may affect issuance of dispositions, the review of AOPs, or integration with other forest operators.

3.2.4 In the GDP, the forest operator shall submit a table tracking the status of all planned DLO roads.

3.2.5 The GDP is complete.

A GDP shall include:

1. Schedules with the following information:

- a) compartment, license or permit areas to be harvested each year of the next five-year period;
- b) timber production summary table for all dispositions for the quadrant;
- c) road corridors showing planning and construction time lines for DLO roads;

- d) a brief description of issues;
 - e) Variance as per 4.1.
 - f) Proposed and actual volumes for any satellite yards
2. A map (of appropriate scale) that shows the following:
- a) the mill site location;
 - b) satellite yard locations
 - c) proposed roads;
 - d) the timber dispositions to be operated;
 - e) for the next two years and if not otherwise addressed in the AOP, the general location of routes, and dispositions where reclamation work will be undertaken

3.3 FOREST HARVEST PLAN (FHP)

PURPOSE

To describe the laid out harvest and road design.

DISCUSSION

The primary components of an FHP are a map and report that clearly show and document the harvest area boundaries, roads and water crossings for the area of the FHP. The laid out harvest and road design shall be valid for five years from the time of approval, unless issues deemed significant by Alberta arise during this period. It is expected that there may be discussion with Alberta before the FHP is submitted; a Compartment Focus (CF) and/or Preliminary Harvest Plan (PHP) may be submitted to Alberta for review and appraisal.

GROUND RULES

- 3.3.1 An FHP shall be approved by acceptance if:
- a) validated by an RFP;
 - b) deletes less than 20% of the area sequenced in the SHS, by compartment per decade;
 - c) the harvest area (ha) does not exceed 100% of the total area in the SHS by compartment per decade as tracked in the GDP; and
 - d) it adheres to all ground rules as per the FHP checklist (see Appendix 5).

Where the FHP does not meet one or more of the above standards, the FHP shall undergo a full review by Alberta. Variances from the SHS shall be reported in the FHP in a format acceptable to Alberta (see section 4.1).

Unless otherwise approved by Alberta, variance exceeding 20%, shall have an approved CA prior to receiving approval for the FHP.

- 3.3.2 If a CA was completed, the FHP shall undergo a full Alberta referral and review to ensure the direction in the CA has been implemented.
- 3.3.3 Prior to submission of the FHP, the company may complete a CF or PHP to identify and mitigate issues prior to layout. These documents will be reviewed and/or appraised by Alberta. The content of these documents shall be agreed to by mutual agreement between the company and Alberta.

- 3.3.4** The FHP will follow the direction from the approved PHP and/or CF for the compartments that had such plans submitted and approved.
- 3.3.5** FHPs shall be validated by an RFP for operators who harvest more than 30,000 m³ annually from Crown land.
- 3.3.6** Other forest operators affected by the FHP have agreed in writing with the FHP before it is submitted for approval (see section 5.1.1).
- 3.3.7** If not otherwise submitted, maps shall show complete and accurate information for the compartment or disposition.
This includes:
- a) proposed and laid out cut blocks;
 - b) orthophoto or the approved forest inventory;
 - c) laid out class I – IV inter-block roads and Department License of Occupation (DLO) roads for the purposes of timber operations;
 - d) current dispositions and reserves (e.g., registered trapline boundaries, permanent sample plot (PSP) locations);
 - e) watercourses and their classifications;
 - f) identified springs, water source and seepage areas;
 - g) locations of access control measures;
 - h) planned watercourse crossing locations for channelled watercourse crossings;
 - i) current information on previously harvested areas and unless otherwise addressed, existing trails, seismic lines, power lines, pipelines and access routes; and
 - j) sensitive wildlife sites as per section 7.7.4
- 3.3.8** Operational information shall be provided in addition to the FHP map.
Operational information includes:
- a) area (ha) and coniferous and deciduous volume for each proposed harvest area;
 - b) summary table of variances from the SHS for each FHP (see section 4.1);
 - c) description of how the CA is addressed;
 - d) list of watercourse crossing locations for channelled watercourse crossings;
 - e) description of integration with other users (see section 5.1.1); and
 - f) description and location of sensitive wildlife sites as per section 7.7.4.2.
- 3.3.9** The company shall follow existing integrated landscape management (ILM) or access development strategies when developing DLO roads. Alberta may approve deviations from these strategies after discussions with the company.
- 3.3.10** Where not previously addressed, comments have been provided for each harvest area where applicable.
The following shall be considered:
- a) harvest area comments shall be included on the block map form that depicts the laid-out block boundary and road;
 - b) layout bordering and encompassing riparian management zones when different than the standards in section 6.0; either map or describe variance
 - c) layout bordering restricted areas (e.g., PSPs, private land, etc.);
 - d) identification of understory (see section 7.5);
 - e) harvest area-specific structure retention and woody debris management strategies;
 - f) tactics to address forest health issues;
 - g) Protection of roadside vegetation where layout is different than that proposed in the SHS;

- h) need for a detailed harvest area plan (see section 3.3.10);
- i) important wildlife sites as defined in section 7.7.4 (this information shall be made available for resource planning purposes only through Fish and Wildlife);
- j) site specific historical resource considerations;
- k) soil protection measures for unfrozen ground timber operations as per 9.2;
- l) harvest areas within wildlife zones;
- m) where not otherwise addressed, identification of linear disturbances that may be removed through silvicultural activities.

3.3.11 Detailed harvest area plans (DHAP) have been provided where there is higher than average potential for environmental damage if operations are not carefully planned.

Circumstances that require DHAPs include:

- a) Areas of steep topography requiring specific road location and construction or specialized harvesting equipment.
- b) Unstable slopes are generally to be avoided, but if this is not possible, it is necessary to plan operations carefully to minimize impacts.
- c) Harvest areas with numerous water source areas, seepages, intermittent, or ephemeral watercourses.
- d) Harvest areas requiring understory protection using protection techniques (see section 7.5).
- e) Harvest areas located near high-value recreation areas, tourism areas, and facilities.
- f) Partial harvests, excluding commercial thinning (CT) and pre-commercial thinning (PCT).
- g) When harvesting is used as a tool to control insects and disease infestations.

The DHAP shall include a map of appropriate scale to the issue(s) and describe how the concern will be addressed in operations. DHAPs are not submitted to Alberta but must be available upon request.

3.4 ANNUAL OPERATING PLAN (AOP)

PURPOSE

To annually authorize all road, harvest and forest management activities for the operator.

DISCUSSION

The AOP articulates in detail the activities proposed for the current year; it must be approved by Alberta before timber operations shall commence. The AOP components include:

- a) operating schedule and timber production;
- b) applicable FHPs;
- c) CAs (if applicable);
- d) reforestation program;
- e) fire control plan;
- f) road plan ;
- g) GDP.

Refer to Appendix 1 for RFP validation requirements.

For timber permit operators and small quota holders who harvest less than 30,000 m³ annually, Alberta has alternate AOP submission requirements.¹

GROUND RULES

- 3.4.1** The AOP shall be submitted by May 15 unless otherwise agreed to by Alberta. Alberta shall respond within 30 days. The AOP shall be reviewed by Alberta for approval.
- 3.4.2** The operating schedule and timber production, reforestation program, fire control plan, and road plan, have been submitted as in 3.4.1, unless otherwise agreed by Alberta.
- 3.4.3** The AOP schedules only harvest areas, roads and crossings approved in an FHP.
- 3.4.4** The AOP is complete.
Complete AOPs shall contain the following components:
- a) The map(s) referred to in 3.3.7 and requested shape files (or other digital format approved by Alberta) of approved FHP harvest areas, inter block roads and or points of watercourse crossings locations;
 - b) administrative and timber production information:
 - I. name of disposition holder(s)
 - II. number of the disposition(s)
 - III. date of submission and effective period
 - IV. location of mill where timber will be manufactured or processed, unless alternative reporting has been approved
 - V. where all volumes (deciduous and coniferous) will be charged (quota, deciduous timber allocation, FMA, Commercial Timber Permit (CTP))
 - VI. proposed harvest volume to be harvested by the timber disposition holder
 - VII. Community Timber Program Operators shall include all road use agreements
 - VIII. scaling methodology, e.g., weigh scale, other arrangements, (not necessary if otherwise submitted)
 - IX. utilization standards
 - X. declaration or list of land use notifications, and date of notification (see Sec 5.0);
 - c) operating schedule – a table which outlines:
 - I. list of blocks proposed for harvest (including area and volume by conifer or deciduous, with totals)
 - II. i. List of roads proposed for construction and reclamation (for non-DLO roads) except in-block roads and access into a block < 100m from existing access. It includes channelled watercourse crossings to be installed or removed and the following road information unless otherwise agreed to:
 - by compartment, and appropriate columns totalled for all compartments:
 - road identifier
 - road class
 - road length
 - tenure (how long on the land)

¹ TM118 form

- status (active/ deactivated (inactive)/ reclaimed)
- date of construction of road or portion of road completed
- reclamation/deactivation date (proposed or actual)
- access control (yes/no)
- Inspection issues e.g. Non-functioning crossings and timeline for corrective action, erosion, ruts, over 5 yrs and no DLO, etc.

ii. A summary of the above roads proposed for construction or reclamation within the AOP year, including:

- Total km of new road to be built this AOP year, by class and tenure
- Total km of road being proposed to revert from AOP road to DLO road in that AOP year
- Total km of road being proposed in this AOP year to be reclaimed
- Total km of road being proposed in this AOP year to be fully deactivated
- Total km of road being proposed in this AOP year to have seasonal erosion control put in place.

III. i. If not otherwise submitted, in the AOP the forest operator shall submit a table tracking the status of all roads until they are totally reclaimed. The reclamation of these roads shall be done as soon as timber operations are complete or within five years of construction. The table shall include all items in 3.4.4 c) II. i. (Above).

ii. A summary of the above of roads in III. i. (above) containing:

- Total km of existing and/or maintained road
- Total km of road with seasonal erosion control
- Total km of deactivated road
- Total km of reclaimed road
- Total km of non DLO roads greater than 5 years old not deactivated or reclaimed

IV. i. A list of all DLO roads, including (unless otherwise agreed to):

- Compartment
- Road name/identifier
- Road class
- Tenure
- DLO number (if applicable)
- DLO status (may be “required” or “application” etc.)
- length
- current status (planned, constructed, reclaimed, etc.)
- Construction date (planned or actual)
- Deactivation date (planned or actual)
- Reclamation/deactivation year and level (planned or actual)
- crossings (# of by type)
- Access Control – required? Yes or no, unknown (if possible)
- Access Control in Place? Yes or no

- **Inspection issues e.g. Non-functioning crossings and timeline for corrective action, erosion, ruts, over 5 yrs and no DLO, etc.**

ii. **A summary of DLO roads in IV. i. unless otherwise agreed to, the summary shall indicate, at a minimum:**

- **Total km of existing DLO roads**
- **Total km of maintained DLO roads**
- **Total km of deactivated DLO roads**
- **Total km of seasonally deactivated DLO roads (seasonal erosion control)**
- **Total km of reclaimed DLO roads that do not have a RC**
- **Total km of planned DLO roads greater than 5 years old not yet under DLO (application stage?)**
- **# DLO's and length of DLO's approved but yet to be constructed**

V. declaration of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items

VI. debris disposal methodology;

- d) **annual reforestation program (see section 8.2);**
- e) **fire control plan (see section 7.3);**
- f) **road plan (see section 11.2.2 and 11.2.3);**
- g) **GDP.**

3.4.5 All amendments to harvest plans must be justified and submitted to Alberta in writing. RFP validation of all amendments is required. Any changes must be incorporated into the as-built plan and/or the annual silviculture report. Unless otherwise agreed to with Alberta, the following applies to the FMA Holder (Regional offices will determine if embedded operators can follow this amendment procedure).

3.4.5.1 Changes meeting the following criteria are considered 'Notifications or Minor Amendments. If not identified in this section, then the change is to be considered a Major Amendment unless otherwise approved by Alberta. Notifications and minor amendments shall not adversely affect buffers established for the protection of riparian areas, wildlife sites, historical resources, or aesthetic values:

Any other change or amendment to approved plans, not outlined below, requires Senior Forester approval prior to implementation.

Notifications - don't require Alberta's approval, provided all appropriate background checks have been made. Changes can be implemented prior to notification but must be reported no later than seven working days after implementation.

- a) **Changes that trigger AOP administrative amendments: road name, block number or crossing number change;**
- b) **Additions and deletions to the approved AOP harvest area boundary where the final area does not vary from the area in the**

approved FHP by more than five percent for blocks greater than 20 ha, or more than 1.0 ha for blocks less than or equal to 20 ha (Any resulting variances from the approved SHS must be categorized and tracked as per section 4.1.);

- c) **Introducing a second year AOP block or road into the current year;**
- d) **Movement of any roads within harvest area boundaries that cause a change in the crossing location over ephemeral or intermittent watercourses;**
- e) **Inter-block roads (including ephemeral or intermittent watercourse crossings if present) that are moved up to two Right-of-Way widths from the approved FHP location, or that are moved to existing access or conventional seismic lines where re-growth is less than 3m, provided that no additional intermittent or larger watercourse crossings are required;**
- f) **Additional road crossing structures on ephemeral watercourses within harvest area boundaries;**
- g) **Additional crossing locations required for temporary equipment movement over intermittent watercourses;**
- h) **Using an alternative route for silviculture access (existing seismic or trail) with no impacts to regeneration or watercourse crossings;**
- i) **Planting of additional openings not listed in the approved AOP (providing the requirements of the FGRMS manual are met);**
- j) **Substitution of planting stock type, seedlot, species, or density (providing the requirements of the FGRMS manual are met);**
- k) **Completing establishment or non-legislated surveys in openings not listed in the approved AOP;**
- m) **Road reclamation or deactivation activities not identified in the GDP and/or AOP. Maps and spatial files shall be submitted in the as-built/ report and annual access layer update.**

Minor Amendments – require validation by company and require Forest Officer or Forester approval prior to implementation. Approval may be by way of formalized letter or via e-mail.

- a) **Inter-block roads that are moved more than two Right-of-Way widths from the approved FHP location, including associated crossings;**
- b) **Construction of up to 100m of new inter-block access, that connects to an approved access route;**
- c) **Additional crossing structures on intermittent watercourses**
- d) **A change to the crossing structure, to a type that is not acceptable as per Table 4 for ephemeral and intermittent watercourses;**
- e) **Additional decking space inside an approved harvest area;**
- f) **Mechanical scarification of additional openings not listed in the approved AOP;**
- g) **Movement of FHP approved small permanent crossing location within harvest area boundaries;**
- i) **Cone collection; felling trees outside of approved block boundaries specifically for the purpose of cone collection;**
- h) **Cone collection: in-block or via pruning.**

3.5 SALVAGE PLANNING

PURPOSE

Salvage planning shall be implemented when necessary to reduce the potential for loss of fibre.

DISCUSSION

Under certain circumstances, planning shall be expedited to reduce the loss of fibre from fire, disease or insect infestation, blowdown or other unforeseen disturbances.

Salvage planning shall not be used when:

- a) the disturbance regime is slow moving and can be accommodated under conventional planning timeframes and protocols;
- b) the regime is not an imminent threat to green fibre;
- c) fibre loss is deemed to be within an acceptable range.

Salvage planning does not confer rights to the planner to ignore other values, or the inherent value of a natural disturbance. It does allow for consideration of all values and for prompt, qualified, professional opinion to drive the process.

GROUND RULES

3.5.1 Salvage planning has been initiated on the natural disturbance.

This occurs when deemed appropriate by Alberta.

3.5.2 An FHP for the salvage area has been developed, and forms part of the AOP.

Modified timelines and content for the FHP shall be considered by Alberta. Detailed requirements may be published from time to time by Alberta.

4.0 UTILIZATION

4.1 STAND UTILIZATION

PURPOSE:

Track variance from the approved FMP - SHS as well as total area harvested in order to:

- **ensure a sustainable harvest level and future forest objectives are maintained through operations adhering to the FMP;**
- **improve information for the next FMP (e.g., landbase, yields);**
- **make decisions around FHP acceptance**

DISCUSSION

The *Alberta Forest Management Planning Standard, Annex 1, Section 6.0 Harvest Planning Standards* indicates scheduling of stands through the FMP - SHS is dependent upon the timber merchantability criteria allocated in the disposition holder's tenure document (e.g., FMA, quota certificate) and the management assumptions used in the timber supply analysis (TSA). Pertinent assumptions are comprised of deletions from the net landbase (e.g., subjective deletions, stream buffers, protected areas) and parameters that determine a stand's eligibility for harvest (e.g., earliest age of harvest). The SHS results from the analysis of these TSA inputs coupled with basic field reconnaissance. The SHS identifies spatially (subunit and location) and temporally (period) the queue of stands that will produce the sustainable timber harvest level (AAC) and desired future forest condition.

Adhering to the SHS is imperative to achieving the timber supply forecasts and the forest conditions expected. Variance from the SHS will not allow the FMP to realize its objectives and forecasted outcomes. Operational variance is unavoidable but must be effectively managed.

Variance shall be monitored and reported where:

- 1) **Merchantable Stands** scheduled in the first decade of the SHS are not harvested in that decade; and
- 2) **Special Features** not identified in the FMP net landbase are encountered during layout or harvesting and are deleted from the SHS.

Timber Harvest Planning and Operating Ground Rules require timber operators to protect special features through detailed harvest planning and careful operations (e.g., riparian buffers, steep slopes, sensitive sites, cultural/heritage sites, areas with high aesthetic value shall be removed from the SHS.)

Disposition holders shall complete Variance Table 1 and Variance Table 2 as they monitor the operational implementation of their plans against the SHS. The format of the tables may be changed based on discussions between the area and the company as required fields may vary regionally.

Definitions:

Deletion - Those stands or portions thereof removed from the 10 year SHS after its approval. Entire stands which are bypassed (not harvested) are to be tracked and reported as a deletion unless approved by Alberta. Entire stands may not be temporarily bypassed unless they form part of a logical operational group of harvest areas or are approved by Alberta for other reasons (i.e.,

stands near an all weather road to be temporarily bypassed and saved for contingency purposes). Only deletions of 1 ha and greater will be classified as variance and reported in the FHP and GDP.

Bypassed – A stand that is deferred from harvest until later in the 10 year SHS timeframe. Entire stands that are deleted are to be tracked as variance as they are deleted from the FHP. The reason for deleting a stand must be explained in the FHP.

Variance - Is any deletion from the SHS to the laid out harvest design as shown in the FHP (area is not harvested yet). Where the area tracked as variance in Variance Table 1 has changed by more than 5% after harvesting is complete, an update to variance shall be provided in the next submission of Variance Table 2 (see 4.1.3 below). Variance is the sum of deletions and deferrals.

Deferral - Those stands or portions thereof removed from the 10 year SHS after its approval, which are intended to be harvested at a later date. Deferrals are those stands or portions of which are operable, not isolated, and should be available for future harvest. Only deferrals of 1 ha and greater will be classified as variance and reported in the FHP and GDP.

Total SHS Area – Is the total SHS area within the FHP.

SHS Planned Area - Is the total area of the SHS laid out in the FHP.

Actual Harvested Area - Is the as-built harvested area in the FHP.

Additions - Area not part of the 10 year SHS that is added to the FHP harvest area. Area can only be added to the SHS polygon during layout when an equal or greater amount has been deleted and tracked as variance. The sum of total area to be harvested and total area already harvested cannot exceed 100% of the SHS area/subunit without moving to appraisal of the FHP. Only additions of 1 ha or greater will be reported in the tables below. Where the area tracked as additions in Variance Table 1 has changed by more than 5% after harvesting is complete, an update to additions shall be provided in the next submission of Variance Table 2 (see 4.1.3 below).

Total FHP Area - Is *SHS Planned Area + Actual Harvested Area*. (Variance Table 2 definition)

Planned FHP Area - Is *SHS Planned Area (ha) + Additions (ha)*. (Variance Table 1 definition)

Stratum - Is the yield stratum used in the FMP timber supply analysis.

Subunit or Compartment - Operational subunits of a forest management unit (FMU) delineated by environmental, operational or watershed characteristics.

GROUND RULES

4.1.1 Companies shall submit a map to show the comparison of the SHS to the laid out FHP highlighting all deletions, deferrals, and additions >1 ha.

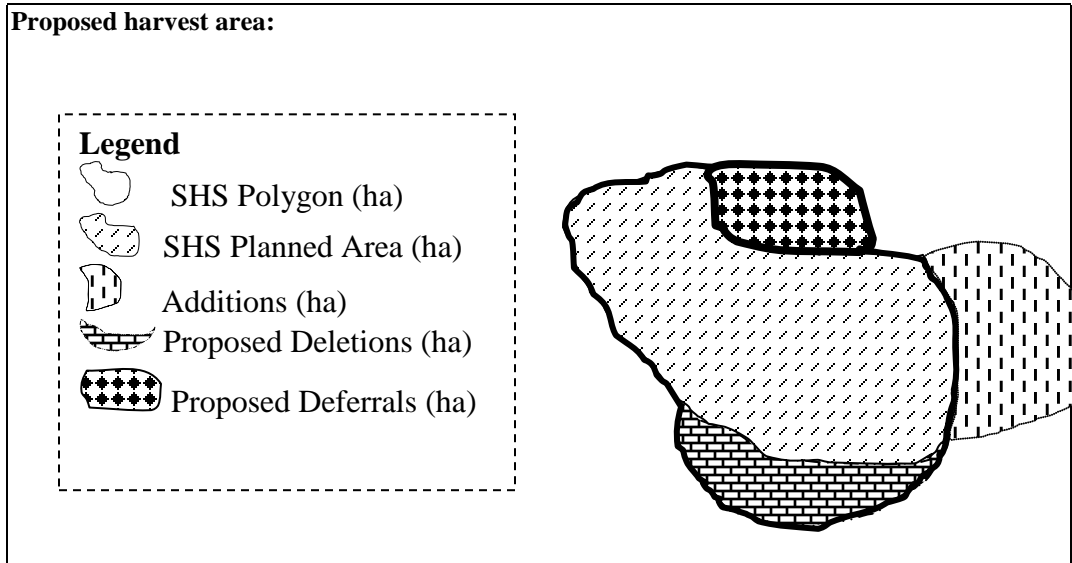
4.1.2 Variance shall be reported by stratum for each FHP. The table shall include the minimum information as per Variance Table 1. Total FHP variance shall be calculated and reported as a % of total SHS Area (ha) (Variance Table 1). An FHP will be appraised when FHP variance exceeds 20%.

Variance Table 1

FHP 1

Stratum	Total SHS Area (ha)	SHS Planned Area (ha)	Variance (ha)			Total Unplanned SHS Area Within Compartment (ha)	Additions (ha)	Planned FHP Area (ha)
			Deletions	Deferrals	Total			
Stratum 1								
Stratum 2								
Total								
Total (%)								

Proposed harvest area:



4.1.3 *Variance* from the SHS shall be monitored and reported by subunit or compartment. The cumulative variance for all FHPs shall be reported by subunit and reported annually in the GDP. The table shall include information as per Variance Table 2. Where the planned compartment variance by decade is greater than 20%, Alberta will assess the need for a CA per section 3.1.

Variance Table 2 Subunit or Compartment 1

	Total SHS Area (ha)	SHS Planned Area Remaining (ha)	Actual Harvested Area (ha)	Variance						Total Unplanned SHS Area Within Compartment (ha)	Additions (ha)	Total FHP Area (ha)
				Deletions		Deferrals		Total				
				(ha)	(%)	(ha)	(%)	(ha)	(%)			
FHP 1												
FHP 2												
FHP 3												
FHP 4												
Sub-Total												
Total (%)												

Note 1: Information in the grey boxes is to be used to assess compliance to 3.3.1.

Note 2: Information carried down from Variance Table 1 into Variance Table 2 may change after harvest where changes to the FHP block exceed 5%.

Note 3: Information will be reported in the next FMP net landbase document.

Note 4: Deferrals, deletions and additions < 1ha shown on the map in 4.1.1 are not required to be included in these summary tables unless otherwise agreed to.

4.1.4 Additions shall be monitored annually and summarized by area/stratum/subunit and reported as per the tables above. Stands currently not part of the net landbase that are found to be productive merchantable landbase may be considered for addition with Alberta’s approval.

4.1.5 Justification shall be provided in the FHP (block comments) in the following instances:

- a) bypassed stands;
- b) entire deleted or deferred stands;
- c) entire stand additions (adjacent to planned SHS blocks) from outside the 11-20 year SHS;
- d) entire and partial stand additions (not adjacent to planned SHS blocks) from outside the 11-20 year SHS.

4.2 TREE UTILIZATION

PURPOSE

To utilize all merchantable trees and pieces in a merchantable stand as defined by the timber disposition and the FMP.

DISCUSSION

Tree utilization assumptions in the FMP must be followed so that sustainability is not affected.

GROUND RULES

4.2.1 Timber harvesting operations have met the utilization standard used in the timber supply analysis of the FMP.

The standard is stated in the applicable timber disposition and shall normally be one of the following:

Coniferous Utilization Standards

15/11 Utilization

- Merchantable Tree: one that has a minimum diameter of 15.0 cm outside bark at stump height (30 cm) and a usable length of 3.66 m to a 11.0 cm top diameter (inside bark). Processing cannot render a usable tree into an unusable piece.
- Merchantable Piece: one that is 2.44 m (plus 5 cm trim allowance) or longer, with an 11.0 cm (inside bark) small end, where rot content or form does not render it unusable.

13/7 Utilization

- Merchantable Tree: one that has a minimum diameter of 13.0 cm outside bark at stump height (15 cm) and a merchantable length of 3.66 m to a 7.0 cm top diameter (inside bark).
- Merchantable Piece: one that is 2.44 m (plus 5 cm trim allowance) or longer, with a 7.0 cm (inside bark) small end, where rot content or form does not render it unusable.

Deciduous Utilization Standards

15/10 Utilization

- Merchantable Tree: one that has a minimum stump diameter of 15.0 cm outside bark at stump height (30 cm) and a merchantable length of 3.66 m or greater to a 10.0 cm top diameter (inside bark), or to the point where the stem is unusable or there is no central stem due to heavy branching.
- Merchantable Piece: one that is 2.44 m or longer to a 10.0 cm (inside bark) small end, where rot content or form does not render it unusable.

Salvage Operations

19/13 Utilization

- This standard may be adopted by Alberta to encourage recovery of timber damaged by fire or insects and diseases in coniferous and deciduous stands.
- Merchantable Tree: one with a minimum diameter of 19.0 cm outside bark at stump height (30 cm) and a merchantable length of 3.66 m or greater to a 13.0 cm top diameter (inside bark).

- 4.2.2 Coniferous and deciduous log butts or large ends exhibiting advanced decay greater than 50% in the area of the cut surface (basal area) shall be bucked at 0.61 m intervals or less to 50% sound wood.**
- 4.2.3 Average stump height shall not exceed that allowed in 4.2.1 when measured from ground level. Where necessary, average stump height shall be determined by utilizing a 100 m transect to determine average stump height. Exceptions may include stumps left to delineate harvest areas, create rub posts for understory protection.**
- 4.2.4 As per the Debris Management and Structure Retention ground rules, forest operators are permitted to leave merchantable volume in harvest areas as per section 7.4.**
- 4.2.5 All trees/pieces used in the construction of crossing structures shall be scattered or piled along the ROW for erosion control or in the harvest area, but not in the watercourse. Merchantable trees/pieces used in the construction of crossing structures must be charged to the appropriate disposition. If the volume is not recovered it must be reported based on an agreed to estimating process, tracked and reported under the appropriate disposition.**
- 4.2.6 Company processing practices cannot create an unmerchantable piece from a merchantable tree.**

5.0 INTEGRATION WITH OTHER USERS

5.1 DECIDUOUS/CONIFEROUS INTEGRATION

PURPOSE

To ensure that planning, harvesting and reforestation in overlapping dispositions are carried out efficiently and with a minimum of environmental impact.

DISCUSSION

Due to overlapping tenures, integration of activities between the various operators is essential. Alberta monitors the integration of roads and harvesting, but the responsibility for co-ordinating plans and operations lies with the operators. Integration of activities is necessary to:

- a) reduce the amount of time roads are open;
- b) reduce disturbance of wildlife;
- c) enable prompt reforestation.

GROUND RULES

5.1.1 All operators with overlapping conifer/deciduous dispositions shall agree to the FHP and GDP before approval is granted.

The proponent shall provide the FHP and GDP to all operators with an overlapping timber disposition in the area at least 30 days in advance of submission to Alberta. In the absence of any response from the operators with overlapping timber rights, agreement shall be considered to have been given 30 days after the date of transmission. In the event that agreement cannot be reached among the overlapping timber disposition holders, the operators will each provide a written rationale of why agreement could not be reached to the ESRD area manager. Within 30 days of receiving the written rationale from all companies, the ESRD area manager will provide a decision which may include: 1) direction on areas of disagreement through approval conditions, 2) withholding of approvals to one or more parties until agreement can be reached.

5.1.2 All roading, harvesting and silviculture operations shall be completed at a time and in a manner that enables effective reforestation and meets identified access management objectives.

5.2 FOREST RECREATION AND TOURISM

PURPOSE

To manage the implications of forest management activities on forest recreation.

DISCUSSION

Forest management activities can impact recreational opportunities. Potential exists for increased public awareness and for increased recreational opportunities through co-ordination with forest

management practices. The FMP will strive to address recreational issues through a variety of tactics such as deferrals, buffers around specific sites, and access management strategies.

GROUND RULES

- 5.2.1 Operational tactics to mitigate identified impacts on recreation and tourism shall be described in the harvest plan.**
- 5.2.2 The forest operator shall work with recreation or tourism groups that have raised concerns with the operator or have been identified by Alberta.**
- 5.2.3 Where the need has been identified, opportunities for the enhancement of recognized recreational trail and road systems for recreational sites overlapping planned timber harvests shall be identified in the harvest plan where possible.**

5.3 TRAPPING

PURPOSE

To integrate harvest operations with trapping.

DISCUSSION

Communication with the owner and/or operator of a trapline is a key element in integrating harvest operations with trapping activity. Discussions held early in the planning process allow both the trapper and the forest operator to work co-operatively, with the least amount of disruption to their individual operations. To facilitate communication between forest operators and trappers, Fish and Wildlife shall annually update the list of RFMAs and owners. Upon request the local Fish and Wildlife office shall provide the relevant list of trappers to the forest operators.

GROUND RULES

- 5.3.1 A representative of the forest operator shall make reasonable effort to verifiably contact the senior partners of a registered fur management area (RFMA) during the preparation of the forest harvest plan. Information such as cabin locations, trails and other improvements, or concerns shall be noted at this stage. During the development of the forest harvest plan, information and concerns shall be integrated into the plan. The forest operator shall provide the trapper with a copy of the approved FHP map.**
- 5.3.2 The forest operator shall notify the senior partner of the trapline at least 10 days prior to commencing timber operations in the RFMA.**

5.4 RANGE MANAGEMENT

PURPOSE

To integrate forest and range management operations.

DISCUSSION

The goal is to develop a co-operative, long-term relationship between grazing disposition holders and forest operators to sustain fibre and forage resources.

During the harvest planning process the emphasis is to integrate harvesting, silviculture, and grazing schedules to ensure the sustainability of timber, forage, wildlife and watershed values (i.e., wildlife habitat, watershed protection). Specific harvesting and reforestation operations and grazing systems would be identified within components of the AOP.

Effective communication between the timber and grazing operators is necessary. Discussions held early in the planning process are intended to enable the grazing disposition holder and the forest operator to work co-operatively minimizing the disruption to their individual operations. Alberta has developed standards to guide the integration of timber and grazing. These standards will be used by the two industries to ensure effective communication and integration is occurring on overlapping dispositions.

GROUND RULES

5.4.1 The forest operator shall conduct all operations in accordance to the Grazing Timber Integration Manual and Directive SD 2011-03.

5.5 FOREST AESTHETICS

PURPOSE

To manage the visual impact of timber operations on the forest landscape.

DISCUSSION

The objective is to mitigate the impact of timber operations on the visual quality of the forest landscape by:

- identifying the location of forest landscapes and other areas of high visual and scenic value, and setting objectives for their management;
- addressing visual quality issues through ESRD referrals in the forest harvest plan.

Areas considered highly sensitive are those:

- a) within, adjacent to or viewed from recreational sites and tourist developments (i.e., a lodge).
- b) seen from elevated, recognized public viewpoints;
- c) adjacent to, or viewed from, major travel corridors (roads, lakes and rivers), rural/urban forest interface and site-specific areas identified during the referral and public review process;
- d) adjacent to primary and secondary highways in Alberta.

Tactics to reduce the impacts of timber harvest and reforestation on visual quality may include: retention of forest structure and lesser vegetation at strategic vantage points in the harvest area, modification of harvest area design, low impact scarification techniques, vegetative buffers, and utilizing natural topography.

GROUND RULE

- 5.5.1 Highly sensitive areas shall be assessed and tactics shall be employed in the harvest planning process to mitigate the impacts of harvesting and reforestation on visual quality.**

5.6 HISTORICAL RESOURCES

PURPOSE

To ensure that forest operators identify and protect historical and cultural resources.

DISCUSSION

There are many thousands of historical resources (e.g., archaeological and paleontological sites), located on Alberta's Crown land. In keeping with the requirements of Historical Resources Act, forest operators shall develop and implement a process for identifying and protecting resources regulated by the Act.

GROUND RULES

- 5.6.1 All known historical resources shall be identified and managed in keeping with the requirements of the Historical Resources Act.**
- 5.6.2 If a previously unknown historical resource is discovered during road building, harvesting, or silviculture operations, the operations that may directly affect the historical resource shall cease and Alberta shall be notified.**

6.0 WATERSHED PROTECTION

PURPOSE

To manage the implications of timber operations on water quality, quantity, and flow regime by:

- minimizing the potential for sedimentation in watercourses;
- preventing soil, logging debris and deleterious substances from entering watercourses;
- maintaining aquatic and terrestrial habitat;
- complying with the Water Act including the Green Zone Exemption.

DISCUSSION

The FMP shall address watershed water quantity and flow issues. Ground rules define operating practices to protect water quality and riparian values.

Riparian areas adjacent to watercourses and water source areas perform a number of ecological functions. Riparian areas help to regulate stream flows (storage and release of surface and groundwater), reduce sheet, rill and gully erosion, and moderate stream temperature. Riparian areas also prevent sedimentation of streams which can affect mortality of fish eggs. Functional riparian areas provide bank stability, debris for creating aquatic habitats and provide a source of food and nutrients for aquatic organisms. Riparian areas also provide habitats supporting a high diversity of wildlife species and other terrestrial biota, and provide corridors that can link different landscape and habitat features. Establishing buffers on watercourses is an agreed upon tactic to protect the values identified above. The challenge at the harvest planning level is to classify streams according to a set of agreed upon criteria. At the same time, it is recognized that stream channels change over time particularly during flood events, prolonged wet periods or drought. Forest operators and ESRD will need to work cooperatively to ensure the classification system is used effectively.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act. The proponent may require advice and approvals of the federal agencies (Department of Fisheries and Oceans) regarding federal legislation requirements.

GROUND RULES

- 6.0.1 Watercourses shall be classified according to Table 1, Watercourse Classification.**
- 6.0.2 In the event the bank development and channel classification is not distinctly evident, the width of the channel shall be determined by the average of measurements taken at 50 m intervals, at representative points of undisturbed stream channel over the length of the watercourse bordering the block. Where the distance bordering the block is not enough for at least two measurements, the measurement interval distance shall be reduced to 25 m.**
- 6.0.3 During timber operations, measures shall be implemented, including temporary and permanent erosion control measures if required, to minimize erosion and sedimentation into the watercourse or waterbody.**
- 6.0.4 Riparian protection areas shall be established as in Table 2, Standards and Guidelines for Operating beside Watercourses unless otherwise approved by Alberta. Where uncertainty exists on the classification of the watercourse, the**

watercourse protection area shall be that required by the higher class of watercourse, unless otherwise agreed to by Alberta.

- 6.0.5 Unmapped or incorrectly classified watercourses encountered during operations shall be given the appropriate protection as described in Table 2.**
- 6.0.6 Variances from the stated allowable standards in Table 2 must provide rationale that aquatic and terrestrial objectives are met. Any such proposals shall undergo a full review by Alberta prior to being considered for approval.**
- 6.0.7 Sediment or deleterious materials (e.g., fuels, oils, greases, industrial or household chemicals or refuse) shall not be deposited into the water or onto the ice of any watercourse or water body during road construction, maintenance, harvesting, and reclamation or silviculture operations.**
- 6.0.8 Equipment shall cross watercourses only at approved crossings as specified in Table 2.**
- 6.0.9 Logs shall not be decked in intermittent or larger watercourses, riparian areas, or water source areas. Alberta may approve decking in a water source area during frozen conditions.**
- 6.0.10 Authorized in-stream activities in fish-bearing watercourses shall be scheduled to avoid disturbing migration, spawning and incubation of fish species, and carried out in such a manner as to minimize stream sedimentation.**
- 6.0.11 Beaver ponds shall have the same classification as the watercourse flowing out of the pond as measured at a representative location within 50 m of the dam.**

Table 1. Watercourse Classification - * If agreement cannot be reached then channel width is the determining factor in Watercourse Classification

Watercourse Classification					Fisheries/Wildlife Values	Potential Impacts
Type	Mapping Designation	Physical Description	Portion of Year Water Flows	Channel Development		
Class "A" Waterbodies	As designated by the Code of Practice for Watercourse Crossings (Water Act)	Not applicable	Not applicable	Not applicable	Known habitats critical to the continued viability of locally or regionally important fish species; Habitat areas are sensitive enough to be damaged by any type of in-stream activity or changes to water quality or flow regime	Fish and fish habitat affected by sediment load, turbidity, disposition of sediment, chemical contamination or alteration of stream flow
Class "B" Waterbodies	As designated by the Code of Practice for Watercourse Crossings (Water Act)	Not applicable	Not applicable	Not applicable	Key broadly distributed habitat areas important to the continued viability of a population of locally or regionally important fish species; Habitat areas are sensitive enough to be potentially damaged by in-stream activities; Potential short and long-term effects of in-stream activities considered to have detrimental effects on, and are high risk to, the survival of fish populations	Fish and fish habitat affected by sediment load, turbidity, disposition of sediment, chemical contamination or alteration of stream flow
Large Permanent	Solid heavy line or double line	Major streams or rivers; Well-defined flood plains; Often wide valley bottoms	All year	Non-vegetated channel width exceeds 5m	Resident and migratory fish populations; Important over wintering, feeding and rearing habitat; Important wildlife feeding/travel corridors	Water quality often reflects all upstream land use impacts and natural processes; Primarily sedimentation of stream channels; Loss of wildlife habitat, restriction of movement
Small Permanent	Usually solid although are sometimes broken heavy lines	Permanent streams; Often small valley bottoms; Bench floodplain) development	All year but may freeze completely in the winter or dry up during periods of drought.	Banks and channel well-defined Channel width from 0.5 m to 5 m Gravel and rubble usually present	Significant insect populations; Important spawning and rearing habitat; Resident and migratory fish populations; Over wintering for non-migratory species; Important wildlife feeding/travel corridors;	Primarily sedimentation of stream channels; Water quality and water yield; Fish population sensitive to siltation; Loss of stream bank fish habitat; Loss of wildlife habitat, restriction of movement

Continued...

Table 1. Watercourse Classification

Watercourse Classification					Fisheries/Wildlife Values	Potential Impacts
Type	Mapping Designation	Physical Description	Portion of Year Water Flows	Channel Development		
Intermittent	Usually broken line; To be identified during layout.	Small stream channels; Small springs are main source outside periods of spring runoff and heavy rainfall	During the wet season or storms Dries up during drought	Distinct channel development; Channel usually has no terrestrial vegetation; Channel width less than 0.5m; Usually some bank development	Food production areas; Potential spawning for spring spawning species; Drift invertebrate populations in pools and riffles; Spring fed areas may provide spawning potential for fall spawning species	Sedimentation from bank and streambed damage will damage fish spawning and invertebrate habitat as well as downstream fish habitat; Water quality and water yield
Ephemeral	Not normally mapped	Often a vegetated draw	Flows only during or immediately after rainfall or snowmelt	Little or no channel development; Flow area is usually vegetated	Siltation may impact fish habitat downstream	Sedimentation downstream due to ground disturbance
Water-Source Areas	To be identified during layout	Areas with saturated soils, surface flow or seepages and contributes directly to stream flow	All year May or may not freeze in winter	No channel development, but may be pronounced vegetation changes	Year-round springs provide potential value to fall spawning fish; Potential high-use areas terrestrial wildlife	Disturbance may cause downstream sedimentation; Interruption of winter flow may disrupt fish egg incubation; Loss of mineral licks
Lakes	Solid outline a water body; Reserved areas noted on referral map	Large water collection areas permanently filled with water	Normally frozen in winter	Shorelines defined by absence of permanent terrestrial vegetation	Important fish-bearing habitat; Important bird nesting/rearing areas	Aesthetic values may be disrupted; Potential for wildlife disturbance; Local sedimentation
Oxbow Lakes	Solid heavy or outline	Large water collection area formed when oxbow cut off from main river channel. - Often vegetated	Normally frozen in winter	N/A	Important habitat for ungulates	Thermal cover/grazing areas

Table 2. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, Decking and Bared Areas	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Class “A” Waterbodies	Not permitted within 100 m of high water mark of the mapped Class A unless approved in the AOP. Any existing roads may be maintained at present classification standards. Any proposed watercourse crossings within 2 km upstream must be temporary type 1 crossings as defined in the Code of Practice for Watercourse Crossings and must be specifically approved in the AOP.	No disturbance or removal of timber within 100 m of the high water mark of the main stem of the Class A unless specifically approved in the AOP; No duff disturbance of intermittent (min 10 m vegetated buffer) or ephemeral drainages (minimum 5m vegetated buffer) within 2 km upstream of Class A waterbody.	Not permitted without specific Alberta approval	Not allowed without specific Alberta approval.
Class “B” Waterbodies	Not permitted within 60 m of high water mark of the mapped Class B unless approved in the AOP. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 2k m upstream of the mapped watercourse must be specifically approved in the AOP.	No disturbance or removal of timber within the appropriate riparian area specified by stream type in Table 2 of the OGRs unless specifically approved in the AOP; No duff disturbance of intermittent (minimum 10m vegetated buffer) or ephemeral drainages (minimum 5 m vegetated buffer) within 500 m upstream of Class B waterbody.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 60 m is approved, no machinery is permitted within 30 m of the high water mark.
Large Permanent	Not permitted within 100 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 60 m of high water mark unless specifically approved in the AOP. No removal of timber shall be approved within 10 m of the high water mark.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 60 m is approved, no machinery is permitted within 20 m of the high water mark;
Small Permanent	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	No disturbance or removal of timber within 30 m of high water mark unless specifically approved in the AOP. No removal of timber shall be approved within 10 m of the high water mark.	Trees shall be felled so that they do not enter watercourse. Should slash or debris enter the watercourse immediate removal is required without a machine entering the watercourse.	Where removal of timber within 30 m is approved, no machinery is permitted within 20 m of the high water mark;

Continued...

Table 2. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, Decking and Bared Areas	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Intermittent	Not permitted within 30 m of the high water mark or water source areas within the riparian management zone unless specifically approved in the AOP.	Buffer of brush and lesser vegetation to be left undisturbed along the channel; Width of buffer shall vary according to soils, topographical breaks, water source areas and fisheries values.	Trees shall be felled so they do not enter watercourses, unless otherwise approved by Alberta. Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse.	Heavy equipment may operate within 20 m only during frozen or dry periods. No skidding through watercourse except on snow/ice bridge or logfill. Crossings must be planned with adequate crossings to be removed on completion of operations. Where fish and spawning movements have been identified, special crossings that do not obstruct upstream fish passage or cause stream siltation may be required.
Ephemeral	Construction not permitted within a watercourse or water source area.	Buffer of undisturbed vegetation in wet gullies, Class "A" and "B" waterbody tributaries to be left undisturbed.	Accumulations of slash and debris to be removed progressively	Skidding restrictions apply on Class "A" and "B" waterbody tributaries; Skidding shall only be during dry or frozen conditions; Temporary crossings to be removed on completion of operations; On Class "A" and "B" waterbody tributaries, special crossing structures that do not cause stream siltation may be required.
Lakes (little or no recreation, waterfowl or sportfish potential)	Not permitted within 100 m of high water mark unless specifically approved in the AOP.	No disturbance or removal of timber within 100 m of the high water mark except where specifically approved by Alberta. Removal of timber within 30 m of the high water mark is prohibited unless approved by Alberta.	Trees shall be felled so they do not enter watercourses, unless otherwise approved by Alberta. Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse	If timber removal is approved, no machinery to operate within 40 m of the high water mark unless specifically approved by Alberta

Table 2. Standards and Guidelines for Operating Beside Watercourses

Watercourse Classification	Roads, Landings, Decking and Bared Areas	Watercourse Protection Areas	Operating Conditions Within Riparian Areas and Water Source Areas Where Operations are Approved	
			Tree Felling	Equipment Operation
Lakes (with recreational, waterfowl or sport fish potential)	For shorelines not located within reserved areas, no disturbances shall be permitted within 200 m of the high water mark unless specifically approved in the AOP.	On lakes exceeding 4 ha in area, no disturbance or removal of timber within 100 m of the high-water mark. Alberta in the FHP may require additional protection. On lakes less than 4 ha, removal of timber prohibited within 30 m of the high-water mark and any removal within 100 m requires Alberta's approval.	Trees shall be felled so they do not enter the waterbody, unless otherwise approved; Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse.	Consideration must be given to aesthetics when harvesting adjacent to lakes with recreational potential.
Water source Areas and Areas Subject to Normal Seasonal Flooding (sometimes evidenced by willow or grassy openings)	Construction not permitted unless approved in the AOP; Unless approved by Alberta, no log decks permitted; The number of stream crossings must be minimized; No disturbance of organic duff layers or removal of lesser vegetation.	Treed riparian management zone of at least 20 m on all water source areas; No harvest of merchantable trees or disturbances of lesser vegetation unless specifically approved in the AOP; Buffer width may be altered according to its potential to produce surface water, provided it is approved in the AOP	Heavy machinery not permitted with in water source areas during unfrozen soil conditions; Minimal disturbance or removal of duff or lesser vegetation; Timber may be harvested if stream sedimentation is the only resource concern, provided there is no disturbance of the organic soils and lesser vegetation when harvesting the trees; On unstable areas subject to blowdown, merchantable trees shall be carefully harvested from water source areas to minimize root disturbances of duff layers and watercourse damming.	Road construction, timber harvest, reforestation and reclamation shall be done with equipment capable of operating without causing excessive disturbance to the soil layers; Heavy equipment is not permitted during moist or wet soil conditions, but may be operated during frozen periods; No soil caps or depositing of soil permitted on roads in water source areas, unless a separation layer is incorporated or the road is designed to provide adequate surface and sub-surface drainage away from the road bed; Where a separation layer is used, the soil cap shall be removed as operations are completed.
Oxbow Lake	Construction not permitted within 100m of oxbow lake unless specifically approved in the FHP.	Operational buffer of brush and lesser vegetation to be left undisturbed along the channel;	Heavy equipment not permitted around oxbow lakes during unfrozen conditions. Trees shall be felled so they do not enter the waterbody, unless otherwise approved; Should slash or debris enter the watercourse, immediate removal is required without the machine entering the watercourse.	Approved activities shall be done with equipment capable of operating without causing excessive disturbance.

See Water Act for definitions of class A and B waterbodies.

7.0 HABITAT MANAGEMENT

7.1 LANDSCAPE PLANNING AND HARVEST AREA DESIGN

PURPOSE

To implement timber operations in a manner that ensures landscapes maintain biodiversity and ecosystem function.

DISCUSSION

Forest operators are expected to manage the forest cover in a manner that maintains biodiversity and ecological integrity. The SHS approved in the FMP is the mechanism by which the forest cover is managed.

Within landscapes managed for timber production, landscape patterns, cover types and seral stages can be managed to produce a desired future forest. The coarse filter approach to maintaining biodiversity in managed landscapes involves managing for suitable amounts and patterns of all forest cover types and all seral stages, along with managing for inherent natural spatial and temporal variability.

The variability of natural disturbances shall be considered when planning harvest area size and shape. This variability will help to provide habitat for species that are dependent on natural disturbance regimes. Use of natural features including stand boundaries as harvest area boundaries is consistent with natural disturbance and shall be used whenever possible.

Setting landscape targets is part of the VOIT process done in forest management planning. Targets describe the amount of each landscape element that will be created, maintained, or managed, as well as the spatial and temporal variability (expressed as a range) of each. Maintaining the range of natural variability in landscapes and element amounts is important because the requirements of biota also vary. Targets will be refined over time using analysis based on natural disturbances, natural succession processes, current and historical conditions within the region, sub-region and ecodistrict or ecoregion.

Wildlife species of special management concern are major considerations in the selection of the SHS in the FMP.

Wildlife movement corridors are required to ensure that animals with large home ranges find passage between and within managed landscapes. When planning for wildlife habitat and movement corridors, the following factors shall be considered: watercourse classification/ profile/ pattern and associated valley definition, timber types and proximity to watercourses, travel corridor width, harvesting method, harvest area shape, continuity of forest cover or adjacency/size of forest patches.

GROUND RULES

If not otherwise addressed in an approved FMP, or structure retention strategy, the following ground rules shall apply:

- 7.1.1** Unless otherwise approved by Alberta, adjacent watersheds of small permanent watercourses shall have wildlife corridors connecting their uplands.

7.2 HARVEST AREA DESIGN AND LAYOUT

PURPOSE

To provide direction for designing harvest areas.

DISCUSSION

Detailed planning of harvest areas must address reforestation, wildlife habitat (e.g., line of site, hiding cover, sensitive sites), watercourse protection, integration with other land uses, understory protection, structure retention, road development and reclamation, and visual quality.

See Section 3.1 – 3.5 for further information on harvest design.

7.3 DEBRIS MANAGEMENT AND WILDFIRE PROTECTION

PURPOSE

To manage the amount and distribution of woody debris left in harvest areas to:

- minimize wildfire risk, particularly near communities;
- optimize ecological benefits;
- minimize the loss of productive landbase;
- and to improve fire suppression capability.

DISCUSSION

Debris or slash accumulation resulting from timber harvest operations must, as a priority, be redistributed or disposed of to minimize the risk of wildfire ignition and spread. However, it is recognized that some retention of debris is valuable from an ecological perspective, and that a reasonable amount of debris retention shall occur to emulate natural forest floor accumulations. Ecological benefits include microtine habitat, furbearer habitat (when piled), and soil nutrient inputs. When debris is maintained, it must be in such a distribution and amount to: 1) minimize wildfire risk as a priority, 2) minimize the amount of productive landbase loss by limiting lost area available for deciduous species suckering, or tree planting, and 3) provide ecological benefit (coarse filter vs. fine filter).

Landscape-level issues regarding the risk of large fires are addressed in the development of the SHS. The FMP shall develop objectives, strategies and tactics that consider the risk of occurrence and spread of fire at the stand and landscape levels.

Opportunities may exist to implement fuel reduction, isolation and conversion on the landscape while accounting for other values. Where applicable, forest companies shall follow the guidelines in the FireSmart Protecting Your Community from Wildfire manual.

Acceptable methods of reducing slash hazards are defined in Forest Protection Branch policy Debris Disposal Requirement for Logging Operations (see Appendix 2).

GROUND RULES

- 7.3.1** Slash accumulations resulting from timber harvesting, road, and campsite construction shall be disposed of within 24 months in a manner acceptable to Alberta.
- 7.3.2** Slash fuel accumulation is not permitted within 5 m of the perimeter of the harvest area. The bordering undisturbed forest floor shall be used as a benchmark to determine what constitutes a significant accumulation. Piles of trees or non-

merchantable timber, tops, or branches deposited during logging that could create fuel ladders are not acceptable.

7.3.3 Burning operations shall :

- a) **not be conducted during the fire season, unless otherwise approved by Alberta through a burning permit;**
- b) **require a post-burn survey to ensure all holdover fires are extinguished.**

7.3.4 The FHP shall comply with Community Firesmart Plans.

7.3.5 A fire control plan must be approved prior to approval of the AOP if not otherwise covered in the fire control agreement. The fire control plan of the AOP shall contain the following if not otherwise covered in the fire control agreement:

- a) **duty roster;**
- b) **list of company woodlands personnel and their fire control training;**
- c) **key company contacts;**
- d) **heavy equipment resource list;**
- e) **small hand tool resource list and their location;**
- f) **company communication system and numbers and call-signs;**
- g) **fire prevention policies;**
- h) **fire prevention strategies;**
- i) **fire prevention priorities (high values at risk);**
- j) **fire operations schedule (i.e., harvesting and silviculture activities within the fire season);**
- k) **identification of barriers to fire spread.**

7.4 STRUCTURE RETENTION

PURPOSE

**To create temporary refuges for forest biota to re-colonize harvest areas.
To maintain snags and live residual trees in harvested areas for biota that depend on these structures following natural disturbances.
To provide wildlife thermal and hiding cover within harvest areas throughout the rotation.
To provide wildlife travel corridors within large harvest areas and compartments.**

DISCUSSION

Although many types of natural disturbance (fire, floods, avalanches, wind events, insects and disease infestations, and slumps) occur within Alberta's forests, fire is the most common. Virtually all trees within intense fires are killed, but following low and moderate-intensity fires many scattered live trees are present. In addition, within all fire types, fire "skips" or "islands" result in residual patches of live trees remaining within larger burned areas. Following other types of natural disturbances, even higher densities of live trees, and patches of live trees, are present. Approximately 30% of the birds and mammals living in Alberta's forests nest, forage or find shelter within live trees that have a basal diameter greater than 20 cm. Many of these species are able to use single large live trees and residual patches of large live trees that remain after natural disturbances.

The retention of single trees and patches of large live trees in harvest areas makes the harvested areas more similar to burned areas. In addition, residual live trees may create some old forest attributes in young regenerating harvest areas. Many of the birds, mammals, insects, beetles, fungi and nonvascular plant species that live in recently disturbed forests require large snags for food and shelter. This unique biotic community changes rapidly as the snags fall and the downed logs

are incorporated into the forest floor. Some biota become rare within ten years following a fire, and many of the early colonizing species have disappeared by the time the stand is twenty years old.

Retaining some large snags within harvest areas creates habitat for some biota associated with naturally disturbed habitat. Additional large snags may be created, by retaining large live trees, as some of these trees will die throughout the rotation. To a large extent, however, it will be necessary to rely on natural disturbances to create abundant large snags for biota that depend on this dead woody material.

Where larger harvest areas are created, it is important to retain a number of individual trees, snags and residual tree patches distributed across the harvest area. These residual tree patches shall be located such that natural features, riparian areas, wildlife features, stand structure and composition, and proximity to standing forests are taken into account to maximize their utility or usefulness by the biotic community.

The closer that natural disturbance effects are replicated the greater the opportunity for maintaining biodiversity over the landscape. Larger patches of residual structure generally have more benefits than smaller patches (lower blowdown probability, interior forest characteristics, hiding and thermal cover) and patches generally have more benefit than individual stems.

Forest structure should be retained in harvest areas as follows:

- a) Leaning or rotten snags or trees of non-merchantable species that are greater than 6 m in height that create a safety hazard may be felled or topped to create safe working conditions.
- b) Snags within 40 m of roads, camps, landings, fence lines, power lines and machine maintenance areas may be felled to create safe working conditions

GROUND RULES:

Structure will be retained in harvest areas according to the following two broad types.

7.4.1 Buffers around sensitive sites (e.g., mineral licks) contribute towards structure retention.

7.4.2 No area within a cutover is more than 300 m from standing structure. Additional structure may be added by the company after review of the initial retention.

Mixed-wood, Deciduous and Spruce/Fir dominated

7.4.3 Individual trees and clumps of non-merchantable and merchantable structure will be left within all harvest areas.

7.4.4 Structure retention shall be at varying levels with number or size of patches increasing as block size increases. Emphasis shall be on structure being in patches rather than single trees.

Pure Pine Stands

7.4.5 Structure retention patches consist of representative forest that are at least 40 years old, laid out are at least 1 ha in size.

7.4.6 An attempt will be made to incorporate non-merchantable patches within the cut block boundary when such patches exist. Areas of non-merchantable timber or shrub areas shall be left in conjunction with structure.

- 7.4.7 Leave as many individual stems of non-merchantable trees (or wolf trees), shrubs and snags as operationally and silviculturally feasible.
- 7.4.8 Individual leave trees and understory trees shall be left when available and when they will not impact on scarification activities.
- 7.4.9 Peninsular patches that “jut” into the block will contribute towards structure retention.
- 7.4.10 Where possible, the spatial distribution of residual structure should be as follows:
 - a) retain residual structure near woody debris piles;
 - b) retain residual structure in patterns and locations that minimize the potential for blowdown;
 - c) retain residual structure along or near ephemeral draws and intermittent streams;
 - d) retain residual structure as part of a wildlife corridor as per 7.1.1.
- 7.4.11 Stubs have only been created to supplement snag densities, aid in wind-firmness of residual patches, delineation of landbase, or for use as rub posts (see 4.2.3).
- 7.4.12 The area of laid out retention patches shall be either shown on the map or reported in the planning process.

7.5. UNDERSTORY PROTECTION

PURPOSE

To protect coniferous understory during timber harvesting and reforestation operations.

DISCUSSION

The main objective of this ground rule is to protect coniferous understories (understory) that will contribute to future forest values. Where appropriate, understory protection must be practiced in all stand types containing white spruce understory, and balsam fir where approved by Alberta (see directive 2001-01). Techniques will vary depending on whether the stand is defined as coniferous or deciduous landbase (see Annex 1, Appendix D for the assignment of understory stands to coniferous and deciduous landbases).

Two understory protection techniques are considered:

- **Avoidance** – Used in the following instances:
 - 1) on deciduous landbase,
 - 2) when a coniferous overstory with a coniferous understory is identified in the FHP,
 - 3) or in low density understory and/or highly aggregated (clumped) understory distribution.

Wind buffering tactics and pre-planning not required, however rub posts, structure retention for wind firmness, and operator avoidance may be used. In cases of low density evenly spaced understory or scarification techniques such as drag scarification, it is not necessary to practice understory avoidance.
- **Planned Protection** – Used in deciduous overstory stands contributing to the coniferous landbase. Includes wind buffering tactics utilizing structure retention and pre-planned strip harvest/skid trails or other methods approved by Alberta.

Acceptable understory stems are 2 m or more in height, are within 75% of the average understory stand height, have 50% or more live crown, are of good health and vigour, are not merchantable at time of harvest, and are crop trees as defined by the Survey Manual.

For planned protection, post-harvest acceptable stems have 50% or more live crown and less than 25% of the crown lost due to top breakage, bole scars (bark removed to the cambium) less than 10 cm (vertical length) and less than 20% of the bole circumference, and are crop trees as defined by the Survey Manual.

The following factors shall be considered when planning for protection of understories:

- 1) **Landbase Assignment From Approved FMP – coniferous or deciduous**
- 2) **Understory Characteristics** - species, density and height, the health and vigour of the understory, the size and wind permeability of the crown, height-diameter ratio (slenderness coefficient)
- 3) **Site Conditions** – soil conditions that may limit rooting (e.g., depth to water table), topographic features that may enhance or diminish wind-firmness, adjacent stand features and impacts on understory wind firmness.
- 4) **Silvicultural Strategy.** – e.g., a block scheduled to be drag scarified does not require effort to protect understory.

GROUND RULES

- 7.5.1 The FHP identifies specific harvest areas for planned protection. Detail on protection techniques shall be described in the FHP harvest area comments and on the detailed harvest plan.**
- 7.5.2 Understory ‘planned protection’ has been practiced and will consider the following:** Protection techniques involve comprehensive pre-planned strip harvest pattern, controlled random skidding (for clumped u/s distribution), wind buffering tactics such as overstory retention.
- 7.5.3 For planned understory protection a minimum of one half (50%) of the total number of acceptable stems (pre-harvest) in an understory have been retained without harvest damage.**
- 7.5.4 Where understory ‘avoidance’ has been practiced consideration will be given to the following:**
Avoidance techniques are used for stands in deciduous landbase or in conifer landbase with low density and/or highly aggregated (clumped) understory distribution. Wind buffering does not need to be specifically pre-planned.
- 7.5.5 Blocks using avoidance techniques that have silvicultural strategies i.e., drag scarification, or low density evenly spaced or suppressed understory may achieve less than 50% protection.**
- 7.5.6 Understory discovered in the field, but not previously identified at the FHP stage, will be subject to the same strategies as stated in the FHP.**
- 7.5.7 An establishment survey has been conducted as per Alberta’s standards. This survey will be used to assess success of the understory planned protection.**
On the coniferous landbase the regeneration standard shall be as approved by Alberta.
On the deciduous landbase, the regeneration standard shall be the deciduous standard in the Survey Manual.

7.6 FISHERIES AND THE AQUATIC ENVIRONMENT

PURPOSE

To conduct timber operations in a manner that shall minimally affect:

- the health, diversity and natural distribution of aquatic biota;
- the quantity and productive capacity of the aquatic environment, including fish habitat, and;
- fisheries management objectives identified in the FMP

DISCUSSION

Current provincial and federal legislation require that the aquatic environment and fisheries resources in Alberta must be protected.

Timber operations can directly affect the aquatic environment and fish habitat in a number of ways. Tree removal in riparian areas and along stream banks can alter light intensity, nutrient supply, sediment inputs, water temperatures, stream bank stability and recruitment of large woody debris to the watercourse. Watercourse crossings, if not properly designed, can create physical barriers to the movement of fish and other aquatic biota along watercourses. Roads and ditches can intercept and transport sediments from the upland source to crossing sites where they are deposited in the watercourse. Upland timber harvesting can also affect watershed water yield and flow regimes. These effects can lead to changes in aquatic primary productivity, food-web pathways, aquatic species abundance and distribution, and channel morphology.

The primary strategy for maintenance and protection of the aquatic environment and fish habitat values is to maintain treed buffers along watercourses and water bodies and adopt rigorous watercourse crossing and erosion control measures. Alternate management proposals for riparian areas would be considered to support aquatic environment and fisheries management objectives in the area, where acceptable to Alberta.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act. The proponent may require advice and approvals of the federal agencies (Department of Fisheries and Oceans) regarding federal legislation requirements.

Additional ground rules for any work carried out in and around watercourses are found in section 11.4 – Watercourse Crossings.

GROUND RULES

7.6.1 All waterbodies and watercourses shall be presumed to be fish bearing or support fish-bearing habitat. However,

The company may confirm the distribution of fish and fish habitat within the planning areas by:

- a) checking the Fisheries Management Information System (FMIS), Water Act Codes of Practice and fisheries inventory data, or
- b) conducting new inventories, or
- c) consulting with the appropriate Area Fisheries Management Biologist.

7.6.2 For any activity that disturbs or alters the bed and banks of a fish-bearing waterbody, an assessment of the potential effects on fish and fish habitat must be conducted by an individual with expertise in fisheries and aquatic assessment methods and habitat mitigation measures. For assessment requirements and methods, refer to Schedule 4 of the Code of Practice for Watercourse Crossings.

7.7. SPECIES OF SPECIAL MANAGEMENT CONCERN

PURPOSE

To conduct planning and timber operations in a manner that shall:

- conserve and plan for an agreed upon level of effective habitat for species of special management concern including grizzly bear, ungulates and others as determined by Alberta from time to time;
- reduce disturbance of ungulates in important wintering habitats through access management.

DISCUSSION:

Game management is an important component to wildlife management in Alberta.

Research has shown that access as defined by the type of use can have the largest impact on wildlife, mainly game populations. It is understood that timber companies are not responsible to manage wildlife populations, but they can play an important role in helping to work with Alberta in the management of access. Research has also shown that for the most part the disturbance created by logging is similar in many ways to the predominant natural disturbance which is forest fires. An obvious and key difference is the access required during logging to transport the trees from the cut block to the mill facilities. Though vehicle/animal collisions on these newly created access routes can affect animal populations this impact is quite small when compared to disturbances which cause wildlife to move from optimal winter ranges and lose fat reserves needed for winter survival and reproductive success. As well as impact from industrial activities, disturbance from OHV recreational riding and from regulated and non-regulated hunting can play a large role in wildlife population success. These can be controlled through access control measures. If access is not managed, the roads built for logging can become entrance ways for highway vehicles, OHVs and hunting activities and potentially having a large impact on a population of animals such as grizzly bears which is already at levels that are causing biologists concern.

7.7.1 ACCESS MANAGEMENT

When looking at access management options it is important to consider the full range of impacts that each option might have. For example, the option of having only summer access into a specific river valley might work well for protecting ungulate populations, but could have a negative impact on grizzly bears. Restrictions of harvest activity during either the winter or summer period could have a negative impact for the timber operator and the ability to deliver timber to its manufacturing facilities in an efficient and timely manner.

It is important to distinguish between road construction activities that occur parallel to river valley corridors and those that bisect through a river valley corridor. The Sundre Forest Products Forest Management Area has relatively few roads as compared to other FMAs within the province. When building roads, rugged topography leaves few options for road location alternatives. Most water flows west to east within the FMA and most wood is hauled in a north/south direction requiring many river valley corridors to be crossed. This will require careful planning and cooperation between Alberta and the timber operators.

The impacts of roads on resource values may require mitigation through access control measures. Wildlife, sensitive areas (i.e., historical sites, soils), protection of road quality and safety are reasons for implementing access control. A number of strategies and tactics are available for controlling or restricting access.

Access control measures for long-term roads shall be identified through the submission and review of the phased planning process. For temporary roads, the CF or GDP, and FHP shall be the mechanisms used in identifying access control requirements.

The following list of access control methods identifies a number of options that may be implemented:

- Physical Barriers (e.g., gates; barricades, pilings)
- Road Condition (e.g., berms, ditches, road standard, roll-back, no snow removal)
- Signage endorsed by Alberta
- Regulatory (e.g., sanctuaries, timing restrictions)

GROUND RULES

7.7.1.1 Consideration has been given to the amount, tenure and class of new access roads that are proposed in regionally defined key wildlife zones (regional PLFD land use referral maps).

7.7.1.2 To the extent possible, all new access roads follow existing disturbances.

7.7.1.3 Roads developed in core and secondary grizzly bear range are subject to the following:

- a) **Effective access controls will be in place between all active company operations or as agreed to by Alberta.**

7.7.1.4 In core grizzly bear area temporary roads should be built no sooner than one year prior to harvesting operations (see 7.7.1.3 a). Alberta may approve up to two years.

7.7.1.4 In core grizzly bear areas, roads with a life expectancy exceeding five years has been minimized or has an effective access management strategy in place. Use of winter roads or access management are alternative strategies to mitigate impacts of roads.

7.7.1.5 New road applications in grizzly bear range include a schedule of reclamation and/or deactivation to minimize the establishment of permanent access.

7.7.1.6 Effective forms of public access control for highway vehicles have been maintained as agreed to between the company and Alberta. Control of highway vehicle use of any open temporary or permanent access route may be required. Access routes that are open must have measures in place to prevent highway vehicle traffic.

7.7.1.7 Reclamation techniques used on access routes shall be designed to prevent highway vehicle use with limited off highway vehicle use for Silviculture purposes if required. See 11.3.4.7

7.7.1.8 Where possible all access roads avoid known key habitat features and roads systems should not have multiple access points that enable recreational users to loop through an area.

Grizzly Bear

DISCUSSION

The FMP shall address the harvesting program that is agreed will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern. In the interim, prior to approval of this harvesting program, key grizzly bear habitat and values will be identified by Alberta during the CF referral process. The company, through consultation with Alberta, will use the information from the Foothills Model Forest to identify high quality grizzly bear habitat and other high use areas.

Grizzly bears are classified as a “Threatened” species under the Alberta Wildlife Act and as a species of “Special Concern” under the national COSEWIC system

Landscape level planning is necessary to ensure the availability of effective habitat and managing mortality risk for grizzly bears. The indicators of suitable landscape conditions for grizzly bears are habitat effectiveness, security areas, open road density and habitat connectivity. Specific strategies for landscape planning for grizzly bear shall be agreed upon in the FMP and at the (CF) level.

Unmanaged access routes can have negative effects on grizzly bear populations through increased opportunity for human caused mortality, disturbance and displacement. These negative effects shall be managed by minimizing the amount, tenure and class of new access roads, and by reviewing and acting upon management options (i.e., access management, reclamation strategies for existing routes, avoiding or minimizing access development in critical grizzly bear habitat and by using grizzly bear habitat maps in planning new access).

In many cases the same river valley corridors used by ungulates during the winter season are important areas for grizzly bears during the non-frozen period. Due to the limited population of grizzly bears in Alberta access management must be carefully considered. A “Grizzly Bear Recovery Plan” has been developed in Alberta and direction for industrial operators will come from this plan that may supersede these ground rules. Until such time that the “Recovery Plan” is endorsed it is expected that timber operators will follow these ground rules.

Sundre Forest Products FMA is covered by core and secondary grizzly bear habitat with summer harvesting being necessary for the long term viability of the company. Recognizing that summer ground is spread throughout the FMA and is a derivative of topography and soils, the company will have to access some summer ground in grizzly bear habitat. As well, reforestation of all harvest areas is a legal obligation of the company which may also influence timing of access reclamation. Harvest planning will mitigate the impacts on grizzly bear through either timing of harvest or management of access.

GROUND RULES

7.7.2 Grizzly Bear

Applicable in Key Grizzly Bear Range

The following ground rules apply to areas identified through discussions between the company and Alberta during the planning process. The FHP will include strategies that address potential access management impacts to grizzly bear habitat from harvesting activities.

7.7.2.1 If specifically requested by Alberta as per 3.1, a CA must be completed that addresses the following issues within identified Grizzly Bear areas:

- 7.7.2.2 Roads, skid trails, landings and campsites avoid natural meadows where economically feasible.**
- 7.7.2.3 Areas around known or discovered inhabited grizzly bear den sites will not be harvested within 100 m of the den site.**
- 7.7.2.4 Retention areas should be used in blocks to provide hiding cover, connectivity to forest patches, and protection for dens.**

Key Wildlife and Biodiversity Zones

DISCUSSION

The FMP shall describe the agreed harvesting program that will create the desired future forest, taking into consideration the full range of values including habitat for species of special management concern. In the interim, prior to approval of this harvesting program, ungulate habitat in river valleys will be identified by Alberta during the planning process.

Traditional, high use and high quality winter ranges have been identified and mapped. These layers are on the [ESRD website](#) and are available for download.

Key ungulate winter ranges play a disproportionately large role, given their localized size and distribution, in maintaining the overall productivity of regional ungulate populations. These ranges ensure that a significant proportion of the breeding population survives to the next year. Females not only have to survive, they have to be in good enough shape in the spring to provide a healthy new crop of young.

In the interest of maintaining productive ungulate populations, operating ground rules must reflect an understanding of the biology of these animals and the importance of access management. These must serve two primary purposes:

- a) protection of the long term integrity and productivity of key ungulate winter ranges; and
- b) avoidance of direct and indirect disturbance to animals that are using these ranges during the late winter period.

These habitats are favoured areas for many ungulate species during the winter season. Food sources are generally abundant and become increasingly more important in years of heavy snowfall. With potentially large numbers of ungulates congregating in the river valleys during the winter season it is important that the type and level of access be fully considered with various options being explored. Effective forms of access control are a viable option in those cases where winter harvest cannot be avoided.

GROUND RULES

7.7.3 Key Wildlife and Biodiversity Zones

7.7.3.1 New crossings of major watercourses within key ungulate winter range should be minimized.

7.7.3.2 Completing operations in the KWBZ early in the winter season remains a management objective. Operations may be permitted (on a case-by-case basis), with written approval from the Senior Forester.

7.7.3.3 The AOP shall prioritize blocks for forest operations to be completed as early as possible for operations within the KWBZ planned between Jan 15-April 30th. Unless otherwise approved by Alberta, roads shall be temporary in nature (see “Temporary Road” in glossary and OGR 11.2.2) (define) and have access removed once harvest and silviculture operations are complete. Future silviculture access shall follow 11.3.4.7.

Other Species

DISCUSSION

Additional habitats of selected wildlife species require maintenance of undisturbed habitats, e.g., breeding or denning locations. These species require specific sites in order to complete all or part of their life cycles.

7.7.4 Other Species

7.7.4.1 Sensitive sites listed below shall be protected by retention of an undisturbed, forested buffer (or other management technique) from the edge of the opening associated with these sites, or from the centre of sites without openings. Both Alberta and the forest operator shall make a reasonable effort to identify sensitive sites in the FHP. Sites discovered in the field shall receive the same buffer as those sites previously identified in planning. Buffer widths and duration shall be agreed to in the FHP.

7.7.4.2 Unless otherwise approved, the following buffer widths shall apply:

Sensitive Site	Radius of Vegetated Buffer
Breeding Sites of Species At Risk:	
i.e., Salamanders, Amphibians and Reptiles	100 m
Bat Hibernacula	100 m
Colonial Bird Nesting Area	100 m
Sandhill Crane Nesting Area	100 m
Wolverine Den	100 m
Natural Mineral Licks	100 m or 2.5x sight distance
Inhabited Raptor Nest Tree	100 m
Natural Springs and Beaver Ponds with no outflow channel	20 m-vegetated

7.7.5 GOATS AND SHEEP

Every effort should be made within identified critical goat and sheep ranges, to: a) avoid land use disturbances that may have a direct or indirect adverse effect on the behaviour of the animals, b) avoid permanent alteration of physical habitat conditions e.g., meadows and c) minimize permanent access.

GROUND RULES

7.7.5.1 The company and Alberta shall work jointly to develop a sheep and goat protection plan highlighting mitigation measures required during forest planning and areas for habitat improvement.

a) Temporary access shall be used unless approval given for DLO access through a larger access process. Access restrictions shall be in place between operation and silviculture and maintained until the road is reclaimed.

8.0 SILVICULTURE

PURPOSE

To plan and implement silvicultural practices that result in reforested stands that meet approved regeneration standards.

DISCUSSION

A reforestation program is required by Alberta under TMR 143.1. The reforestation program is a component of the Annual Operating Plan and contains reforestation prescriptions by strata, and a schedule of treatments for the upcoming year. The proposed reforestation program provides a link between reforestation operations and the FMP. The reforestation program must be based on the most current knowledge of treatments (by strata) which lead to reforestation success in terms of reforestation standards. Reforestation prescriptions are a critical point in the sustainable forest management planning system where growth and yield strata targets from the FMP are delivered through well-planned silviculture treatments. Knowledge of how sites respond to different treatments result in better treatments, and greater probability of success in meeting growth and yield strata targets, for height, stocking, density and ultimately, strata volumes.

An acceptable silvicultural process includes:

- site assessment (pre or post harvest) based on ecosite classification;
- a prescription table or 'matrix' of silviculture treatments or tactics for specific strata;
- regeneration standards based on yield curve strata targets;
- an annual treatment schedule of activities;
- an assessment/survey system, and feedback mechanisms to ensure regeneration data is used to refine the prescription matrix and, in conjunction with all data sources (including permanent sample plot information), the regeneration standards and post harvest growth and yield assumptions.

GROUND RULES

8.1 PLANNING

- 8.1.1 All harvest areas shall be treated in a manner designed to ensure that the harvest area shall be reforested to the applicable stocking and growth standards described in the Reforestation Standard of Alberta (RSA) as approved by Alberta.**
- 8.1.2 Harvest layouts bordering previously harvested areas shall avoid damaging regeneration.**
- 8.1.3 Reforestation timelines prescribed by Alberta shall begin at the start of the timber year following the end of the timber year when the harvest area has received skid clearance from Alberta, or from a company representative pursuant to a self-inspection agreement between the company and Alberta.**
- 8.1.4 Reforestation prescriptions shall be based on site assessments (pre or post-harvest) that include considerations specific to the site (e.g., Ecosite field guide for Alberta).**

- 8.1.5 The ‘Alberta Forest Genetics Resource Management and Conservation Standards (FGRMS) shall be adhered to in all silviculture planning and operations. The standards specify rules for seed and vegetative material collection, registration, storage, handling, and improved stock testing.**

8.2 REFORESTATION PROGRAM

8.2.1 The reforestation program shall be submitted:

- a) before March 1 for silviculture operations commencing between May 1 and October 31, or
- b) before September 1 for silviculture operations commencing between November 1 and April 30, or
- c) as otherwise specified in an FMA, or at a time agreed to by Alberta.

8.2.2 The reforestation program shall include the following components and information:

a. Reforestation Strategies and Tactics

The company shall state the silvicultural system (strategy) to be used, and the reforestation tactics for each block to be harvested during the operating period, in the silviculture component of the AOP. This component shall also include the following information.

1.0 Silviculture Strategy:

The silvicultural strategy under which the next timber crop will be re-established:

- Even-aged Cutting systems: clearcut; release cut; seed tree; shelterwood; or sanitation cut.
- Uneven-aged Cutting Systems: CT, group selection; and single tree selection.

2.0 Reforestation Tactics: For each block in the disposition, the specific reforestation choice of tactics or combination of tactics are:

- a) Leave for natural reforestation (seed).
- b) Leave for natural reforestation (root suckering).
- c) Scarify and leave for natural seeding.
- d) No site preparation and artificial seeding.
- e) Site preparation combined with artificial seeding.
- f) No site preparation combined with planting.
- g) Site preparation and planting.
- h) Post-harvest surveying and subsequent tactics; or
- i) Other (specify).

3.0 Inclusions

The silviculture component of the AOP shall include a map with the following information:

- All roads not previously approved in the current AOP and new watercourse crossings to be constructed or used (designating their season of use). Once an approved crossing is removed any replacement crossing required at the same location needs a new approval.

Proposals for herbicide application shall be submitted for approval in accordance with approved vegetation management strategies and Alberta requirements (see Herbicide Reference Manual). Herbicide proposals are a component of the reforestation program in the AOP, but may be submitted separately from the AOP.

CT (Commercial Thinning) proposals shall be submitted for approval as part of the AOP unless otherwise agreed by Alberta, in accordance with Alberta’s requirements.

b. Proposed Silviculture Treatment Schedule

The Silviculture Treatment Schedule shall contain the following information:

- opening number;
- a list of blocks and the estimated area (ha) to be treated;
- season or date of activity shall be provided upon request.

The following proposed reforestation activities for each block (or stand) shall be listed:

- I. Site Preparation – mechanical or chemical treatment;
- II. Planting – notification if outside approved seed zone is provided to Alberta Tree Improvement and Seed Center (ATISC);
- III. Seeding – notification if outside approved seed zone is provided to ATISC;
- IV. Leave for Natural – species;
- V. Manual Tending – type (cleaning versus spacing or combination);
- VI. Fertilization;
- VII. Commercial Thinning;
- VIII. Regeneration surveys – establishment and performance;
- IX. Cone/cuttings collection – if unknown, Alberta shall be notified regarding collections as per the (FGRMS);
- X. Let it grow as a retreatment strategy;
- XI. NSR declaration.

Should the proposed reforestation activities for a block change after AOP approval, the following items require an amendment to the AOP:

- additional blocks to be treated by any means of treatment;
- A summary of surveys shall be provided in the Silviculture report for use in Forest Operations Monitoring Program planning

Example Silviculture Treatment Schedule

Working Circle	Compartment	Block	Opening Number (ARIS)	Planned Tactic	Block Area Ha
3	2	0144	5190472544A	SFN-P	7.5

- a map may be requested by Alberta showing areas to be treated, roads and crossings to be constructed or used if different from the FHP.

See Section 12.0 REPORTING for reforestation activity reporting requirements.

8.3 SILVICULTURE OPERATIONS

- 8.3.1 Site preparation and other silviculture activities must follow the same AOP conditions and ground rule standards which apply to timber operations (i.e., stream crossing requirements, watercourse buffers, tree/understory retention, and Forest Soils Conservation Guidelines).**
- 8.3.2 Herbicide, pesticide and fungicide use shall be performed in accordance with Alberta requirements.**
- 8.3.3 Planting boxes shall be disposed of within 12 months of planting and are to be removed to an appropriate disposal facility if ground access exists. If ground access does not exist, boxes may be securely placed within existing debris piles for disposal by incineration. All plastic shall be removed from boxes and disposed of at an approved waste disposal site prior to burning. Based on past operator performance, Alberta may condition the AOP for removal of planting boxes.**
- 8.3.4 Site preparation creating linear disturbance patterns, shall be oriented to minimize channelling of water downslope.**

9.0 SOILS

PURPOSE

To conduct timber harvest, road construction, reforestation and reclamation operations in a way that shall:

- **minimize the potential for soil erosion;**
- **prevent soil, logging debris and deleterious substances from entering watercourses;**
- **ensure that the capability of the site to support healthy forest tree growth is maintained.**

DISCUSSION

Minimizing soil displacement, compaction and rutting/puddling during road construction, harvesting, and silvicultural operations is a primary concern. Soils are most at risk of compaction and rutting/puddling when the soil is moist or wet, with the more poorly drained soils remaining wetter longer. The soils are equally at risk in the winter months if they are wet and the soil has not frozen, which is a common occurrence. Rehabilitation of compacted soil in harvest areas (off – road) is seldom an option because they are generally wet and additional machine traffic will often cause more soil damage. Therefore, protection of soil is best achieved in choice of equipment, staff training and advanced planning of operations. In terms of advanced planning, it is recommended that a pre-harvest site assessment include the evaluation of soil drainage class across the harvest area delineating sensitive areas with imperfectly and poorly drained soils. Management of field operations shall involve operating on soils when they are as dry as possible. The weather and percentage of sensitive areas in the harvest area shall be taken into account when scheduling areas for harvesting.

GROUND RULES

Pre-harvest planning

- 9.1 Areas susceptible to rutting, puddling or compaction shall be avoided when planning temporary roads, decks, landings and skidding patterns.**

Harvesting

- 9.2 Areas susceptible to rutting, puddling or compaction shall be harvested during dry or frozen conditions (e.g., harvest areas with predominantly imperfectly-poorly drained soils).**
- 9.3 Where an approved silvicultural strategy does not exist for reforestation of disturbed soil, the total area covered by temporary roads, bared landing areas, and displaced soil created by timber harvesting operations shall not exceed five percent of each harvest area without prior approval of Alberta. Disturbance is measured using length x average width. Blocks less than 7 ha or narrow blocks may exceed five percent with notification and reporting on the as built plan.**
- 9.4 Operations shall not occur during heavy rainfall or when soil conditions are above field capacity (saturated).**
- 9.5 Machine traffic on sensitive soil sites shall be minimized.**

- 9.6 Operations shall cease when instances of multiple ruts in a limited area are created that are clearly related to operations during unfavourable ground conditions.
- 9.7 Erosion and soil disturbance must be limited, with effort made to retain organic matter and soil nutrients.

Post-harvest reclamation/reforestation

- 9.8 Roads within harvest areas that are no longer required shall be reclaimed and reforested. Treatments acceptable to Alberta are required on compacted soils.

10.0 FOREST HEALTH/PROTECTION

10.1 INSECT AND DISEASE

PURPOSE

- To minimize the risk of occurrence, and spread of insects and disease, which have the potential to impact forest management objectives.
- To prioritize the salvage of timber damaged by insects and disease.

DISCUSSION

The presence of insects and diseases are a symptom of an unhealthy forest. The impact of certain insects and diseases shall be addressed when planning harvesting, silviculture operations, and surveys. Several biotic and abiotic forest health agents affect the growth and survival of trees. Each agent poses a threat to the forest. Priority for management shall be given to those agents that have the greatest impact or could potentially cause the most damage by:

- a) increasing the wildfire hazard;
- b) reduction or loss of merchantable volume;
- c) detracting from landscape aesthetics.

GROUND RULES

- 10.1.1 Harvest plans and operations shall be prioritized in stands with insect and disease issues. Variance from FHPs to address insect or disease issues may be acceptable if approved by Alberta. Infected and infested stands shall be ranked based on the type and intensity of insect and disease present, or the presence of dead trees. Stands or trees shall be ranked for treatment or harvest as follows:**

Rank 1: Stands or trees with the presence of mountain pine beetles or spruce beetles.

Rank 2: Stands with a significant number of dead or dying trees resulting from fire, insects or, disease (not ranked as 3 or 4), or windthrow.

Rank 3: Stands infected with mistletoe, spruce budworm, forest tent caterpillar, root disease (Tomentosis, Armillaria) or jack pine budworm.

Rank 4: Stands infected with needle cast, Western gall rust, root collar weevils, Atropellis or other miscellaneous forest health agents.

- 10.1.2 Management tactics are based on the Forest Health ranking and are as follows:**

Rank 1 stands or trees: Control Measures must be undertaken before adult beetles take flight, either through harvest or single tree treatment. Alberta and forest operators shall

work co-operatively to prevent spread through aggressive action. Control measures may be executed in areas otherwise excluded from harvest, such as stream buffers, when authorized by Alberta.

Rank 2 stands: Shall be addressed through salvage planning process (see section 3.6, Salvage Planning). Highly unpredictable spread therefore, salvage planning is initiated.

Rank 3 stands: To manage dwarf mistletoe operators shall:

- create a 20 m wide mistletoe-free zone adjacent to the harvest area, or
- create a 20 m wide non-host buffer beside the harvest area perimeter, or
- reforest the harvest area to a non-host species.

Any wildlife tree patches shall consist of non-pine species where possible. For other pests, contact Alberta.

Rank 4 stands: Generally, no control is required for mature stands. Regenerated stands affected by Western gall rust or root collar weevils may require site treatments. Contact Alberta.

10.1.3 Rank 3 and 4 stands will be addressed in the normal planning process and insect and disease assessment information shall be utilized in the FHP to establish management tactics. Where new infestations are found, the information will be used to develop the GDP or for known infestations already sequenced through the SHS, they shall be addressed in the FHP.

10.1.4 Any infestation of Rank 1 agents and all data must be reported to Alberta immediately.

10.1.5 Where dues relief is requested, mistletoe infected stands must be surveyed using an acceptable rating system (e.g., Hawksworth system).

10.1.6 For Mountain Pine Beetle infestations, Alberta may provide direction that supersedes these ground rules.

10.2 WEED MANAGEMENT

PURPOSE

To minimize the impact of noxious and prohibited noxious weeds.

DISCUSSION

The invasion of noxious and prohibited noxious weeds in the forested area of Alberta negatively affects the integrity of the ecosystem. Weeds may alter natural processes and displace plant species that naturally occur in the area.

Under Alberta legislation, the occupant (or owner if there is no occupant) must control all noxious weeds and destroy all prohibited noxious weeds.

GROUND RULES

10.2.1 Forest operators shall follow Alberta's requirements (Directive 2001-06) for weed management in forestry operations.

11.0 ROADS

11.1 ROAD CLASSIFICATION

PURPOSE

To define a road classification system that provides guidelines to all forest operators and potentially all resource users in the Ground Rule Zones.

DISCUSSION

As roads are one of the most significant components of forest harvesting operations, forest operators along with Alberta shall co-ordinate and integrate road planning and construction plans with other resource operators. This classification system will provide consistent working guidelines to be used in planning and operations to facilitate integration. It is important to identify not only construction schedules but closure and reclamation timelines as well. Long term planning of access roads is a significant tactic to address landscape access issues and minimize soil disturbance.

GROUND RULES

- 11.1.1 The operator shall utilize the classification system described in Table 3 during planning.**
- 11.1.2 All roads, regardless of class, with an intended lifespan of greater than five years shall be built under the authority of a DLO.**

Table 3. Road Classification and Design

Road Description	Planning Requirements	Layout	Design and Construction Descriptions		Borrow Pits	Timber Salvage	Debris	Erosion Control
			Right of Way					
			Clearing Width	Road Surface Width				
Class II All Weather	Identified in higher-order plans, i.e., long term access plans. Detailed design plan: a need for detail shall be assessed, i.e., need for cross-sectional profiles based on sensitive area identification.	Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.	20 – 40 m	6 – 12 m	Location identified prior to construction (EFR) or as per submitted TFA.	As per TM Regulations and EFR under DLO.	Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.	Progressive erosion control concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible.

Class III Tertiary Permanent Dry Weather	Phased planning approach must be followed if road is to be used for more than five years.	Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.	Variable width with max width of 35m in topography and max 20 m in flat ground	5-10 m	Location identified prior to construction (EFR) or as per submitted TFA.	As per TM Regulations and EFR under DLO.	Stripping and fine debris may be retained for erosion control or future reclamation by spreading on cuts and fills and any other critical area.	Progressive erosion control concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible.
Class IV Winter or Dry Conditions Class V and VI roads are company designations and are treated as Class IV.	Details to be addressed in development plans. Approved under the cover of an AOP.	Centre line marked. As-built inside harvest area road locations submitted annually through air photo or GPS updates Harvest area access roads mapped.	Variable width with max width of 30m in topography and max 20 m in flat ground	4 – 7 m	Location identified prior to construction or as per submitted TFA.	As per FHP.	Partial disposal. Mechanical or manual cutting of slash and debris to reduce fire hazard to acceptable levels.	Progressive erosion control concurrent with construction. Cross drains and ditch blocks dictated by slope and soil conditions. Drainage water to be diverted off the ROW in as short a distance as possible.

11.2 ROAD PLANNING AND DESIGN

PURPOSE

To outline the plan to integrate, construct, maintain and reclaim roads in order to mitigate impacts or enhance benefits to resource values.

DISCUSSION

The impacts of roads shall be recognized as long-term. It is therefore important that the initial placement of roads be carefully examined. Resource values shall be assessed during the process in order to best mitigate impacts or enhance benefits associated with those values.

The submission of road plans will assist Alberta to facilitate the integration of access management among all resource users (e.g., oil and gas industry). Road plans shall forecast corridor development linking all compartments and other industrial developments.

Safety needs to be addressed throughout the road planning process.

GROUND RULES

11.2.1 Roads

Road Planning

11.2.1.1 Forest operators shall annually submit a road corridor plan and construction schedule in the GDP. The minimum scope of the road construction schedule shall be a five-year forecast with the content requirements being:

Map showing:

- existing forest operator roads by class;
- other existing roads if the digital information is available;
- proposed forest operator corridors and FHP approved long term roads;
- access control points (see section 11.5 Access Control).

11.2.2 Temporary Roads: with lifespans up to five years from the end of construction shall be included for approval in the FHP and the AOP.

Roads and landings shall be planned to avoid:

- a) known unstable soils, water source areas, springs and seepage areas;
- b) creating disturbed, compacted or bared soils that exceed the amount specified in section 9.3 – Soils.

11.2.3 In the GDP, the forest operator shall submit a table tracking the status of all roads over two years old until they are totally reclaimed. The reclamation of these roads shall be done as soon as timber operations are complete or within five years of construction.

11.3 ROAD CONSTRUCTION, MAINTENANCE AND RECLAMATION

PURPOSE

The roads shall be constructed, maintained and reclaimed in a timely manner to minimize environmental impacts.

GROUND RULES

11.3.1 General

11.3.1.1 Existing access (e.g., seismic lines, trails, existing roads), shall be used as a priority wherever practical and feasible.

11.3.1.2 Road ROWs shall be cleared according to standards established in Table 3, or conditions of the DLO, road comments, and any additional conditions approved in the FHP.

11.3.1.3 Landings and block roads shall be constructed to avoid:

- a) known unstable soils, water source areas, springs and seepage areas unless approved in the AOP;
- b) creating disturbed, compacted or bared soils that exceed the amount specified in section 9.3 – Soils.

11.3.1.4 Certified weed free native seed or other approved seed mix shall be used.

11.3.2 Construction

11.3.2.1 Roads, skid trails and landings shall be placed in locations and constructed so that soil erosion, damage to streambeds and sedimentation of watercourses are minimized.

11.3.2.2 On those parts of the ROW not used for grade construction, disturbance to the duff and organic soil shall be minimized to reduce damage to the roots of bordering trees and to provide a protective soil cover.

11.3.2.3 With Alberta's approval, trees with root systems seriously damaged by road construction activities shall be removed from the edge of a road cut.

11.3.2.4 All borrow pits required off the ROW must be authorized by Alberta as per reference document *PLAR Approvals and Authorizations Procedures*, and/or applicable PLA/PLAR Directives.

11.3.2.5 Unless approved by Alberta, sand and gravel pits off the ROW must be authorized under an appropriate disposition.

11.3.2.6 Use of sand and gravel from within the ROW can only be used for company roads directly connected to that ROW. The approval for this is the AOP.

11.3.2.7 Removal of sand and gravel from within the channel or floodplain of any watercourse is prohibited.

11.3.3 Erosion Control/Prevention

11.3.3.1 Erosion control shall be implemented as per Table 3.

11.3.3.2 Initial erosion control measures shall be concurrent with grade construction. Preferably, no more than a 2 km length of bared surface shall be developed between the time the sub-grade is constructed and the completion of erosion control activities.

11.3.3.3 Roads constructed by the company require erosion control, stabilization of disturbed soils and adequate drainage. Where remediation is required the company shall notify Alberta.

11.3.3.4 Water from roads, ditches and bared soil surfaces shall not be permitted to drain directly into watercourses. Where vegetated buffers alone do not retard water and sediment movement effectively, appropriate obstructions (e.g., logs, rocks, mounds) or sediment control structures shall be installed to dissipate the flow of water and capture sediment prior to entering the watercourse.

11.3.3.5 Cross-drainage culverts and other drainage devices shall be installed as road construction progresses.

11.3.3.6 Re-vegetation shall be completed concurrent with operations or as soon as soil conditions permit during the following growing period. Existing ditch vegetation shall be protected during road maintenance wherever possible and re-established where necessary.

11.3.3.8 A portion of the debris from clearing, and strippings from road and landing construction shall be retained and used for re-vegetation and erosion control on disturbed areas.

11.3.4 Reclamation and Deactivation

11.3.4.1 Roads constructed by the company and not under DLO that are no longer required shall be reclaimed as per 11.3.4.7.

11.3.4.2 Roads under DLO that are no longer required shall be reclaimed, and require a Letter of Clearance.

11.3.4.3 Where approved by Alberta, non DLO roads built by the company that are required for future timber operations (< 20years) shall be deactivated as per 11.3.4.7.

11.3.4.4 On dispositions issued pursuant to the Public Lands Act, all borrow and gravel pits no longer required must be reclaimed as per conditions of issued disposition.

Seasonal Erosion Control

11.3.4.5 Roads that are not used continuously throughout the year require erosion control measures including:

- a) shallow surface cross ditches based on slope and soil type;
- b) re-established drainage;
- c) slope stabilization;
- d) Effective access control measures for on-highway vehicles.

Deactivated

11.3.4.6 Deactivation shall be done by completing all of the following unless agreed to by Alberta:

- a) Watercourse crossing and drainage structures that have a risk of erosion or failure are removed, and stream banks and approaches reclaimed. Rollback with large woody debris on each side of the crossing to deter OHV use and minimize sedimentation.
- b) All potentially erodible slopes are stabilized through rollback, seeded to approved vegetation species, and cross-ditched to disperse runoff and suspended sediment into undisturbed areas.
- c) Rollback of initial access points for access control to inhibit on highway vehicle use.
- d) Deactivated roads shall be tracked in the AOP until they are reclaimed as per 11.3.4.7
- e) The tenure of a deactivated road shall not exceed 20 years from the start of construction.
- f) Alberta in discussion with the company may determine at any time the requirement for total reclamation for a road that has been deactivated.

Reclamation

11.3.4.7 Reclamation shall be done by completing all of the following:

- a) Decompacting and returning them to an acceptable landform.
- b) Removing all watercourse crossing and drainage structures and reclaiming stream banks and approaches.
- c) Erosion control (e.g., rolling back topsoil (including slash and logging debris) and re-vegetating erodible bared surface areas.
- d) Rollback of debris and reforestation of entire right of way.
- e) Limited off highway vehicle access may be left for silvicultural purposes where erosion and sedimentation are not an issue. This is intended to enable slow OHV access while removing the recreational potential of the reclaimed road.

11.4 WATERCOURSE CROSSINGS

PURPOSE

To provide guidance so that crossings are constructed, maintained and reclaimed in a manner that ensures negative environmental impacts are minimized and fish and fish habitat are protected.

DISCUSSION

It is important to implement watercourse crossings of acceptable standards to meet the needs of all users. Of primary importance is protection of the aquatic environment. It is intended that water quality, fish passage, bank stability and aquatic fauna habitat are not compromised during watercourse crossing construction, maintenance and reclamation.

The planning of watercourse crossings must consider tenure, user integration, timing constraints, existing plans and assessments, and pertinent policy and legislation. Watercourse crossings shall be designed, installed, maintained and deactivated in accordance with all applicable policy and legislation. See Section 7.6.2 and 7.6.3 for additional information on the implications of the Federal Fisheries Act.

GROUND RULES

11.4.1 Unless approved by Alberta, the company shall only construct the crossings as described in Table 4.

Table 4 – Acceptable Crossing Structures *

Stream Classification	Acceptable Structure	
	Non-Frozen	Frozen
Ephemeral	Log Fill	Log Fill
	Culvert	Snow Fill
	Open Bottom Arch	Culvert
	Bridge	Open Bottom Arch
		Bridge
Intermittent	Culvert	Log Fill
	Bridge	Snow Fill
	Open Bottom Arch	Culvert
		Open Bottom Arch
		Bridge
Small Permanent	Culvert	Snow Fill
	Bridge	Culvert
	Open Bottom Arch	Bridge
		Open Bottom Arch
Large Permanent	Bridge	Bridge
	Open Bottom Arch	Open Bottom Arch

- * Flow is not to be impeded; all legislation, regulations, policies and best management practices must be adhered to.
- Unless previously identified in the AOP, notification of crossing type to ESRD is required as per 3.4.5, or, with previous Forest Officer agreement, at the end of the month the crossing was installed.

- 11.4.1** The company shall follow the Water Act Code of Practice for watercourse crossings.
- 11.4.2** Intermittent and higher-order streams shall be classified in the FHP.
- 11.4.3** Proposed watercourse crossing structures and locations shall be identified in the FHP.
- 11.4.4** Unless otherwise approved, watercourse crossings shall:
- a) minimize erosion and sedimentation;
 - b) have stable approaches;
 - c) be at right angles to the watercourse;
 - d) be at locations where the channels are well defined, unobstructed and straight;
 - e) be at a narrow point along the watercourse;
 - f) allow room for direct gentle approaches;
 - g) have no direct ditch drainage;
 - h) shall have erosion control structures during construction.
- 11.4.5** Watercourse crossings shall accommodate peak stream flows at the following levels as measured using a method acceptable to Alberta:
Proposed:
- a) Long-term roads – shall be designed for a minimum of 1:100 year flood levels; and
 - b) Temporary roads – shall be designed for a minimum of 1:25 year flood levels with the exception of temporary winter crossings that are removed before break-up.
- 11.4.6** On approaches to watercourse crossings, the organic soil layer and lesser vegetation shall not be stripped from portions of the ROW not needed for the road grade.
- 11.4.7** Any in-stream activities shall be scheduled to avoid migration, spawning and incubation periods of migratory or resident fish species (restricted activity periods). Mitigative measures approved by Alberta may allow for deviations from the in-stream timing constraints.
- 11.4.8** Upstream fish passage for migratory or resident species must be maintained at all watercourse crossings on fish-bearing waterbodies.
- 11.4.9** The flow of all watercourses shall be maintained at all times when carrying out in-stream activities, unless otherwise approved under the Water Act.
- 11.4.10** Measures must be implemented to minimize the duration and amount of disturbance of the bed and banks of the watercourse or waterbody. Where damage to the bed and banks of a watercourse occur, appropriate measures to restore the bed and banks must be undertaken.
- 11.4.11** During timber operations measures must be implemented to prevent the deposition of soil, logging debris or other deleterious substances and materials that are toxic, or an immediate threat to fish and other aquatic organisms into any watercourse. Any such substances or materials unavoidably deposited in a watercourse must be removed immediately and reported to Alberta.
- 11.4.12** Measures must be implemented to prevent the transfer of biota that are not indigenous to the environment at the watercourse-crossing site.

- 11.4.13** Stream crossings shall be kept free of accumulated debris. Culverts plugged with ice shall be reopened to prevent flooding during spring thaw.
- 11.4.14** Interim erosion control measures (e.g., silt fences, straw bales or matting, gravel check dams) must be implemented and maintained until permanent vegetation and erosion control measures are established where necessary.
- 11.4.15** Stream crossings that fail shall be reported and reclaimed or replaced (if necessary) with more appropriate crossing structures as soon as possible.
- 11.4.16** Bridge abutments shall not constrict the normal stream channel. Where stream banks must be built up to construct a bridge abutment, soil shall be brought in and deposited from the end of the grade – no equipment shall enter the stream channel. Bridge spans must extend beyond stream banks and abutment walls.
- 11.4.17** The use of bridges is preferred on fish-bearing streams; however, steel culverts may be permitted where they will not restrict upstream passage of fish (see table 4 for more information on watercourse crossings).
- 11.4.18** Culverts for all classes of streams must be designed, properly sized and installed to prevent erosion at both the inflow and outflow ends of the structure. Culverts shall be of sufficient length beyond the fill with the overburden properly backsloped and stabilized to prevent sediment from entering the watercourse, and the ends of the culvert from being constricted. Any culvert on a stream that becomes a hanging culvert must be correctly re-installed as soon as possible (see table 4).
- 11.4.19** Properly constructed logfills (see 11.4.21 below) on temporary roads may be used to cross ephemeral watercourses during dry periods, and to cross intermittent watercourses (with developed channels) during frozen periods. As soon as the temporary road is abandoned, logfills shall be removed so that no soil is allowed into the water channel. Logfills installed during frozen periods shall be removed before the spring thaw. A bottom layer of logs may be left in place when removing the logfill to provide for summer crossing of ephemeral watercourses.
- 11.4.20** Crossing intermittent or ephemeral watercourses within harvest areas shall be avoided when possible. When the crossings of intermittents are necessary, they shall be constructed at specified locations using appropriate watercourse crossing structures.
- 11.4.21** A properly constructed logfill has all of the following:
- a) enough logs to adequately fill an ephemeral draw or watercourse channel so that when the logs are removed there is little or no damage to the banks or channel bottom;
 - b) logs delimbed and bucked to at least 1.5 m longer than the grade fill at each end;
 - c) logs covered by a layer of suitable material that separates the soil from the logs, which shall permit total removal of the soil cap;
 - d) provision for removal that does not disturb the banks of watercourse.
- 11.4.22** In fish-bearing watercourses, any negative impacts on the stability and fish habitat values of stream banks must be minimized. Any damage to streambanks and the corrective measures taken by the company shall be reported to Alberta within 7 days of the occurrence.

11.4.23 A native timber bridge may be used on small permanent or intermittent streams or ephemeral draws, provided that all of these requirements are met:

- a) bridge abutments do not restrict stream channel;
- b) a brow log is installed on both sides of the bridge deck to prevent soil from entering the stream;
- c) no equipment enters the stream channel;
- d) timber of suitable size and strength is available for construction;
- e) the span extends beyond stream bank and abutment walls;
- f) a separation layer is used between soil cap and timber;
- g) the soil cap and separation layer is removed as soon as harvest and hauling is complete;
- h) the remainder of the structure is removed as soon as harvest and hauling operations are completed unless a proposal to leave crossing structures in place after hauling is approved by Alberta and an acceptable monitoring program is in place.

11.4.24 Snow-fills may be used on ephemeral watercourses during frozen conditions, provided that all of the following requirements are met:

- a) sufficient snow exists to fill creek channel;
- b) any soil cap installed over the snow is removed prior to break-up;
- c) measures are in place to prevent soil or other debris from entering stream channel or ice surface;
- d) suitable measures are taken during deactivation to ensure flow is not impeded.

11.4.25 Ice bridges may be used during frozen conditions provided that all of the following requirements are met:

- a) no capping material is used on the bridge;
- b) winter stream flows are not impeded;
- c) approaches of snow and ice constructed of sufficient thickness to protect the stream bank;
- d) appropriate ice thickness exists to bear necessary load requirements;
- e) no alterations to streambed or bank are required;

11.4.26 Each operator shall establish a monitoring program acceptable to Alberta, for their watercourse crossings. Documentation as to current condition, repair requirements, or removal dates of the crossing structures must be maintained and made available to Alberta upon request. Repairs to crossing sites shall be done as per 11.4.15 and notification provided to Alberta.

11.4.27 Watercourse crossings that are no longer required shall be reclaimed with the objective of minimizing any sediment from entering the watercourse by completing all of the following (destabilization of the crossing site due to the activity of other parties are not the responsibility of the company):

- a) removing all watercourse crossing and drainage structures and reclaiming stream banks and approaches;
- b) cross-ditching approaches, rolling back topsoil (including slash and logging debris) and within one year re-vegetating erodible bared surface areas with vegetation capable of maintaining bank stability (e.g., this may include the use of sedges and willow cuttings);
- c) their condition shall be monitored annually until they are satisfactorily stabilized.

11.5 CAMPS AND FACILITIES

PURPOSE

To give guidance to forest operators so that the planning, construction, maintenance and reclamation of camps and miscellaneous facilities is done in a manner that minimizes negative impacts on the forest environment.

DISCUSSION

Camps and other facilities are often a necessary part of operations in remote areas. Forest operators require that such facilities operate in an efficient and cost-effective manner and are implemented without compromising the integrity of the environment.

Some of the best practices for camps and facilities include:

- Place sites out of visual and auditory range from mineral licks and key wildlife areas or use a default of one kilometre.
- Safe camp locations are a priority. Therefore, an evaluation of all potential risks shall be conducted prior to selecting a final camp location.
- Camps and fuel storage sites shall be identified in the annual fire control plan when proposed locations are known.
- Camps shall be kept clean. Proper mechanisms for the disposal of hazardous and non-hazardous waste shall be implemented.
- Camp food and garbage storage shall minimize the potential for problems with wildlife. Recommend following the Bear Smart guidelines for specific mitigation relating to bears. Problems with wildlife shall be dealt with in consultation with Alberta.

GROUND RULES

- 11.5.1 Any facility or camp that shall be in place for more than twelve consecutive months requires an appropriate disposition under the Public Lands Act. Temporary field authorities (TFAs) are required for camps that meet the criteria referenced in the document *PLAR Industrial and Commercial Work Camps on Public Land Directive* (and/or applicable PLA/PLAR policies).**
- 11.5.2 Any facility or camp must adhere to all provincial regulations related to the camp (i.e., Public Health Act – *Work Camp Regulation*).**
- 11.5.3 Where feasible, forest operators shall establish temporary camps and/or other facilities within either new harvest areas or existing clearings (i.e., gravel and borrow pits).**
- 11.5.4 Temporary fuel storage sites shall not be located within 100 m of any flowing watercourse.**

12.0 REPORTING

PURPOSE

To ensure that timber operation activities are reported to Alberta in order to maintain an accurate and current database across the Province.

DISCUSSION

Silviculture and harvest operations reporting and monitoring is necessary to ensure legislated requirements are met in all treatment areas. Ground rules governing operations reporting are required to ensure consistency among forest operators. The intent of activity reporting is to communicate that a given activity has occurred, where it occurred and when it occurred. This information shall also be used for annual and stewardship reports and shall be RFP validated as per Appendix 1.

GROUND RULES

SILVICULTURE AND HARVEST ACTIVITY REPORTING

- 12.0.1 Forest operators who conduct silviculture work on their disposition shall report the details of all work completed in the previous year annually into Alberta Regeneration Information System (ARIS) no later than May 15. The required information is outlined in the ARIS Industry Operations Manual. Information shall be submitted in accordance with all requirements of the manual and associated policy directives.**
- 12.0.2 Alberta may require additional reporting for forest management activities such as thinning, herbicide, pesticide spraying, or fertilization. Alberta shall consult with the company on the appropriate format of such reports. Reporting of herbicide projects are as per Alberta requirements.**
- 12.0.3 Companies harvesting more than 30,000 m³/yr shall have self-inspection agreements in place and shall carry out periodic inspections of active timber operations and report the information to Alberta in a format acceptable to Alberta. Reports based on the 2006-04 directive shall be submitted to Alberta once per month or at agreed to intervals.**
- 12.0.4 As built plan (includes digital shape files of harvest boundaries, road location, and watercourse crossing location and type) from the previous year's harvest shall be submitted at the end of the timber year. The as built shall include disposition number, opening number, block number, block area, and skid clearance date.**

Appendix 1 - Role of Regulated Forestry Professionals² (RFP) in Forest Management

The Alberta Government is committed to sustainable management of forests on public land to provide benefits and opportunities for Albertans. Alberta relies on the professional integrity of RFPs to enhance the effectiveness of forest resource management planning, implementation and harvest activity, while recognizing the interdisciplinary nature of forest management planning.

Alberta requires a RFP to submit the components of forest management plans, annual operating plans and harvest activity reporting, as identified in this annex, for approval.

1.0 Validation by a RFP

RFPs shall validate their submitted work by one of the following methods:

- i. Signing using their professional title and registration number, or
- ii. Stamping and signing using the seal provided by a *College*, or
- iii. Using other mechanisms approved by Alberta.

1.1 Significance of RFP Validation

RFP *validation* provides assurance to Alberta that work is *accurate* and has been prepared with *due diligence*. Government RFPs shall review *validated work* by conducting a reasonable assessment for accuracy and shall take appropriate *corrective actions* where *validated work* is not *accurate*.

The documentation required to demonstrate *due diligence* is viewed as a significant source for validating accuracy. Alberta will not accept inadequate documentation and may refer such occurrences to the Complaints Director of the appropriate *College*.

1.2 Approval of Validated Work

Alberta's approval does not transfer the accountability for the plan or its implementation from the Organization or the submitting RFP to Alberta or its staff. Government RFPs who review submissions are accountable for their reviews and any direction provided to the Organization. *Approval of validated work* shall be addressed as described below.

1.2.1 Appraisal

Work with far-reaching and significant potential effect if inaccurate (such as but not limited to timber supply analysis, GDP). *Validation* of this type of work demonstrates confidence the work is *accurate*; however, due to its potential significance, it is both necessary and important to examine the work carefully. Approval shall be granted after the work has been reviewed by appropriate RFPs to assess accuracy. The timeline for this shall be established by Alberta and will vary depending on the nature of the *validated work*. Those preparing work for appraisal are advised to communicate with the reviewing government RFPs regularly and effectively to minimize confusion over the standards expected of the work.

1.2.2 Acceptance

Work with a more limited potential effect (such as, but not limited to silviculture reports, operations inspections). The work is considered approved on the date Alberta acknowledges receipt of the work. Alberta shall notify the organization by acknowledging receipt within 5 working days of submission. The notification date will be documented by Alberta as the start date for FHP approval. Alberta shall periodically check the work and supporting documentation to verify its accuracy.

² Refer to Alberta Definitions

2.0 Work Validated by a RFP

All entities that conduct timber harvesting or silvicultural activities on public land, except those harvesting less than 30,000 m³ annually from public land, must validate the items described below (the list of work to be validated may be amended from time to time by Alberta to adapt to change).

2.1 Forest Management Plans

The entire *forest management plan* shall be approved through an appraisal and must be validated by the senior RFP responsible for its preparation.

The following components must be validated by the RFP most directly responsible for their preparation. A RFP validated checklist describing the extent of compliance with applicable standards for each component shall be included with each submission:

- i. Yield projections and all associated data and analyses – for appraisal
- ii. Vegetation inventory data – for appraisal
- iii. Landbase description (analysis and report) – for appraisal
- iv. Silviculture strategies (refer to Annex 1, standard 5.5 on managed assumptions)– for appraisal
- v. Forecasting (timber supply analysis) – for appraisal
- vi. Harvest planning (*spatial harvest sequence*) - for appraisal
- vii. Monitoring reports - annual - for acceptance; stewardship – for appraisal

2.2 Annual Operating Plans³

The minimum *validation* requirements are as follows:

- i. General Development Plan – for appraisal
- ii. Compartment Management Focus - for acceptance
- iii. Preliminary Harvest Plan – for appraisal
- iv. Forest Harvest Plan – for acceptance
- v. Road Plan and Fire Control Plan – for acceptance
- vi. Reforestation Program – for acceptance⁴

2.3 Harvesting and Reforestation Activities

Accurate and timely submission of timber production and sales information is important and must be validated. The activities related to reporting timber production and sales must be approved by the senior RFP responsible for the submission.

The following components of timber production and sales must be validated by the RFP directly responsible for their preparation:

- i. Scaling populations (TM262) – for appraisal
- ii. Timber production audits – for acceptance
- iii. Letters of Understanding – for appraisal
- iv. Statutory Declarations of production – for appraisal
- v. Harvest tenure standings – for acceptance
- vi. Timber production reporting – for appraisal
- vii. Silviculture information - regeneration surveys, ARIS submissions and silviculture operations reports, regeneration strata balance/swap/trade summaries – for acceptance
- viii. Field operations inspection reports – for acceptance
- ix. Herbicide reports – for acceptance

³ AOPs are approved subject to a review by Alberta. Where a compartment assessment has been completed the CA, FHP and AOP shall be appraised by Alberta.

⁴ Where thinning plans, herbicide plans, and reforestation prescriptions vary from FMP silviculture strategies the silviculture program shall be appraised by Alberta.

Appendix 2 - Debris Disposal Policy

BRANCH: WILDFIRE MANAGEMENT

MARCH 15, 2010

SECTION: WILDFIRE PREVENTION

DEBRIS MANAGEMENT STANDARDS FOR TIMBER HARVEST OPERATIONS

1. AUTHORITY

- Alberta Sustainable Resource Development (SRD)

2. PURPOSE

- To provide standards for debris management in timber harvesting operations in compliance with the *Forest and Prairie Protection Act* (FPPA) and the *Forests Act*. Compliance will reduce the threat of wildfire to communities and other values within the Forest Protection Area.

3. POLICY

- The FPPA defines debris management standards for debris produced from timber harvest operations. Timber and reforestation activities must comply with the FPPA and the *Forests Act*. The standards will be enforced.
- The *Debris Management Standards for Timber Harvest Operations* policy is effective March 1, 2010 and may be revised. In addition to the management of debris through disposal, this policy also applies to debris retained for reforestation, wildlife habitat or other landscape management objectives.

4. APPLICATION AND IMPLEMENTATION OF THE DEBRIS MANAGEMENT STANDARDS

- Debris management strategies must be linked to landscape objectives and must not conflict with the FPPA. The loss of productive land base resulting from timber harvest operations (debris piles, roads, landings) within the harvest area must not exceed the specifications outlined in applicable Operating Ground Rules. (As per the Timber Management Regulations of the *Forests Act*.)

A. Level II Mountain Pine Beetle Control Debris Management Standards

The standards specified under sections B, C, or D and the FPPA apply.

B. FireSmart Debris Management Standards

During harvest operations, there is a need to manage debris to minimize the risk of wildfire to communities or other values at risk. In order to minimize this risk, the following standards shall be applied:

- I. Within the FireSmart Community Zone (Generally a 10 kilometre buffer of the community's development centre.), debris management strategies, for any purpose, must not include the retention of debris piles for reforestation, wildlife habitat or other landscape management objectives.
- II. Outside of the FireSmart Community Zone, debris pile retention for reforestation, wildlife habitat or other landscape management objectives may be considered an acceptable debris management strategy. Retention is subject to SRD Forestry Program Manager approval through the Annual Operating Plan and in accordance with the standards described herein.

C. Wildlife Habitat and Biodiversity Debris Management Standards

Debris piles that are retained in the harvest area outside the FireSmart Community Zone for wildlife habitat or landscape biodiversity objectives must adhere to the following guidelines:

- I. If the strategy involves random scattered piles throughout the harvest area, the following standards apply:
 - Height of piles must not exceed 2 metres
 - Base diameter of piles must be no greater than 3 metres
 - Distance between piles must be no less than 25 metres
 - Distance from block edge must be no less than 25 metres
- II. If the strategy involves random scattered piles made up of chip residue from chipping operations throughout the harvest area, the following apply:
 - Height of piles must not exceed 2 metres
 - Base diameter of piles must be no greater than 3 metres
 - Distance between piles must be no less than 15 metres
 - Distance from block edge must be no less than 25 metres
- III. If the strategy involves piling of debris at roadside, piles must meet the following standards:
 - Piles can only be left along roads scheduled for reclamation and abandonment following the completion of reforestation (i.e. scarification, planting)
 - Piles must be compacted to a maximum of 2 metres in height, 3 metres in width, 12 metres in length and perpendicular to the road
 - A group of piles may consist of a maximum of 5 piles with a spacing of 6 metres of slash free area between each pile within the group
 - Pile groups must be separated by a 50 metre slash free spacing

D. Reforestation Debris Management Standards

Debris piles or windrows created from reforestation operations must adhere to the following specifications:

- I. If the strategy results in debris piles, the following standards apply:
 - Height of piles must not exceed 2 metres
 - Base diameter of piles must be no greater than 3 metres
 - Distance between piles must be no less than 25 metres
 - Distance from block edge must be no less than 25 metres
- II. If the strategy results in windrows (large logs, humus, and duff), the following standards apply:
 - Windrows must not be greater than 2 metres in height
 - Windrows must not be greater than 3 metres in width
 - Windrows must not exceed an average of 75 metres in length and must have slash free spacing of 8 metres
 - Distance from block edge must be no less than 25 metres

E. Enforcement / Approval

SRD will serve as the "one window" for industry contact and approval and will complete field inspections as required.

Debris piles to be disposed of must be in conjunction with the terms of these standards and the two year timeline set out in the FPPA. SRD will issue an "Order to Reduce or Remove a Fire Hazard" when debris piles have not been properly disposed of in accordance with this Policy and the Annual Operating Plan approved by the department.

Forest Industry may apply to SRD for a one-year extension where drought conditions have prevented them from completing disposal through burning operations. The SRD Forestry Program Manager must approve the extension.

Where debris disposal by burning is the strategy, Industry must report all burning locations to SRD one month before the start of the fire season.

F. Review Process

Research will be carried out by FP Innovations to assess the threat of wildfire associated with debris resulting from timber harvest operations. If findings indicate that standards within this policy directive are not sufficient to support wildfire hazard reduction, the standards and policy will be modified.

G. Cross Reference

Forest and Prairie Protection Act
Forest and Prairie Protection Regulations, Part I and Part II

H. Contact

Hugh Boyd, Director
Wildfire Prevention Section
780-427-7811

DATE:

APPROVED BY:

Bruce Mayer, Executive Director, Wildfire Management Branch

Appendix 3 - Directive for Weed Management

2001-06

Directive No.

Subject

Weed Management in Forestry Operations

Purpose

To implement effective weed management programs administered by holders of *Forests Act* dispositions engaged in forestry operations. This policy applies only to *Forests Act* dispositions.

Policy

Section 60 of the *Public Lands Act* sets out a disposition holder's responsibility with respect to noxious and restricted weeds on dispositions issued under that Act. Similarly, Section 31 of the *Weed Control Act* requires that the occupant (or if the land is unoccupied, the owner) of land destroy all restricted weeds, control all noxious weeds and prevent the spread or scattering of nuisance weeds.

The weed control duties on holders of dispositions issued pursuant to the *Public Lands Act* are reasonably clear and would apply to such dispositions that are issued in relation to forestry operations (e.g. camps, roads, processing sites and other associated land uses). It is, however, not entirely certain as to how the courts would interpret and apply the definition of "occupant" under the *Weed Control Act* in respect of timber dispositions issued under the *Forests Act*.

In terms of forestry operations, the vast majority of weed management situations should fall under either the *Public Lands Act* or the *Weed Control Act*. This Directive attempts to address weed management, in a forest operations context, where neither of these two Acts apply.

The Crown's goal is to address weed management issues on a landscape level, as opposed to on a disposition by disposition level. To accomplish this, a two step approach will be taken. Firstly, the disposition document and annual operating plans (AOP) will be used to describe the disposition holder's obligations with respect to weed management activities. Secondly, the Land and Forest Service (LFS) (and ideally, municipalities) will establish landscape level, co-operative weed management groups, with a mandate to developing a single management plan for all stakeholders involved.

Invasive weeds can alter the ecosystem's natural processes and displace native, threatened, and endangered vegetation and habitat. For these reasons, forest companies are expected to assist in managing weeds in the forested area of Alberta.

Procedure

Amendment of Annual Operating Plans and Dispositions

In order to address situations that fall outside the requirements of either the *Public Lands Act* or the *Weed Control Act* all AOPs prepared and submitted for timber dispositions are to include the following condition. Additionally, this statement is to be incorporated into the disposition itself upon issuance or renewal.

“{Disposition holder} shall, with respect to the land contained in this timber disposition, prevent the establishment of and control all noxious and restricted weeds to which the *Weed Control Act* applies, in a manner acceptable to the Minister.”

The Minister will consider the “*Recommended Standards of Good Practice for Prevention*”, described in the **Guidelines** section to be the minimum level of performance for all disposition holders. Where a disposition holder or weed management group (as described below) prepares a plan outlining weed management, the commitments in that plan will become the standards to which the disposition holder or parties to the group will be expected to meet. This plan will be approved, where appropriate, by the Regional Director.

Co-operative Weed Management Groups

The LFS will establish co-operative weed management groups where willing participants are identified. The specific purpose of the groups will depend on the level of current involvement the individual participants have in weed management. Where participants are currently managing weeds, the purpose of the group may be to review individual existing weed management plans to identify opportunities for co-operative management. Where participants are not currently involved in weed management the purpose of the group may be to develop a single weed management plan for all group participants, or to assist individuals in the development of individual plans if desired.

The role and degree of involvement of LFS staff on these groups will depend on the make-up and desires of each individual group. Typically, the LFS will convene and co-ordinate weed management group meetings, in addition to other roles defined by the group. Forest Management Division staff will work with Forest Area staff to develop provincially consistent Terms of Reference for each group, and provide technical expertise and support where possible. Each group will select its own chairperson and define the roles for each member.

Weed management plans should address inventory, control, education, and prevention. Once a co-operative or individual weed management plan is agreed to, that plan will be implemented through the individual’s AOP. The results of this implementation will be used as the benchmark to which the Minister’s satisfaction for weed control and prevention is measured (i.e. vis-à-vis the AOP clause described above).

Guidelines

To assist in determining whether a disposition holder’s weed management activities are acceptable to the Minister, the following guidelines describe the four essential aspects of weed management: goals, prevention, inventory and control. All of these should be considered when developing weed management activities and plans.

A. Goals

The goals should be specific to noxious and restricted weed prevention, inventory and control. They can be short-term and long-term, as is the nature of weed management.

B. Recommended Good Standards of Practice for Prevention

1. Limit Soil Disturbances

To limit the establishment of weed infestations, prevent unnecessary soil disturbances wherever possible.

2. Clean Equipment

Practice due diligence by ensuring that all equipment and vehicles are free of weed seeds and plant parts before arriving on a job site. All agricultural implements or any equipment knowingly exposed to weeds are to be pressure washed prior to use in forested areas.

3. The Use of Straw Bales for Erosion Control

The use of straw bales for erosion control is discouraged in the Green Area. Unlike hay, it is very difficult to determine if the straw bales are free of weed seeds. Therefore, certified “weed free” hay bales acquired from producers with a “Certificate of Inspection” should be used for erosion control.

4. Use Certified “Weed Free” Seed for Re-vegetation of Disturbed Sites

Canada #1 Seed, approved under the *Canada Seed Act*, may not be weed free. To ensure a seed mix is virtually weed free, a purchaser can request a “Certificate of Seed Analysis.” To get a more detailed “Certificate of Seed Analysis”, the purchaser can request a larger seed sample analyzed, rather than the typical 25g sample to improve the confidence of the analysis. Alternatively, one can start with pure seed and then prepare the seed mix manually.

5. Rapid Response to Weed Infestations

Because a single plant and small infestations are easier to control than large infestations, it is important to manage weeds proactively. To do this effectively, industry and LFS field staff should be trained in the identification of restricted and noxious weeds, and the importance of destroying individual weed plants and reporting new infestations.

C. Inventory

A weed management program is most effective with an accurate account of existing weed infestations. Inventorying is most effective during the months of June through September, when most plants are in bloom and are the most easily recognized. “Noxious” and “Restricted” weed species to be surveyed are listed in the *Weed Designation Regulation (138/80)*. Additionally, the *Weed Control Act* provides municipalities with the authority to designate other species of local concern as restricted or noxious. For this reason weed surveyors should obtain a list of restricted and noxious weeds

from the municipal district(s) within which they are surveying.

D. Prioritizing Areas for Control Measures

As some areas within which weeds are managed consist of a large land base, control throughout the entire area is not feasible. Specific areas should be targeted each year, based on priorities. When prioritizing areas for control treatments, many factors must be considered to deliver the most effective and efficient control program. The following example criteria are not ranked in order of importance, with exception of *Restricted and Noxious*:

1. Restricted vs. Noxious

Target restricted weed infestations over noxious weed infestations. Control of restricted weeds should be implemented immediately following their discovery.

2. Location of Infestation

Target infestations in highly traveled areas over those in isolated areas, thereby limiting the threat of seeds or plant parts being transported.

3. Size of Infestation

Target small infestations before large ones, as it is easier to gain control of small infestations. This also applies to outlying pockets of larger infestations, which should be controlled prior to tackling the larger infestation. When dealing with a large infestation, a “contain and control” strategy (targeting outlying pockets, and/or the perimeter of the infestations) is an excellent option when resources are not available to control an entire infestation.

4. Weed Species

To prevent their establishment, target weed species that are less abundant on a regional basis. When controlling infestations, target the weed species with the greatest ecological impacts. In many situations this may be difficult to quantify, although generally speaking it can be done. For instance, a weed infestation encroaching on a habitat of an endangered plant species would have a higher priority than an infestation among common or non-native vegetation.

5. Co-operative Control Opportunities

Co-operative control is the most effective and efficient method to control weed infestations that span multiple dispositions or border of responsibility. Unless one is adopting a “contain and control” strategy, generally it is not a good idea to control only part of an infestation.

E. Control Options

When selecting a control method, it is important to note that different species respond differently to each method. The most efficient programs will have an integrated control plan that includes both prevention and one or more of the following control methods:

- ◆ **Mowing / Cutting** - Effective for perennial weeds. Careful monitoring and proper

timing are necessary for this to be a viable option. If a site is mowed over several years, well-developed root systems can eventually be depleted. Weeds should not be mowed once seed set has occurred, as this will aid in spreading seed.

- ◆ **Hand Pulling** - Effective for annual or biennial weeds, especially when dealing with small infestations or individual plants. Hand pulling may have to be done annually (before seed set) for several years, as dormant seeds in the soil may continue to germinate. If any weeds are pulled when in flower, they must be bagged and burned, as they will set seed if they are left on the ground.
- ◆ **Herbicide Application** - Very effective but will not guarantee 100% control. Sites may have to be revisited again the next year for follow-up treatments. Several herbicides are effective for each weed species. Chemical selection should be determined by site, weed species, existing desirable vegetation, and whether or not a residual effect is wanted. Assistance with selecting a herbicide and application rate can be obtained through a Municipal District, County Agricultural Fieldman, or Certified Pesticide Applicator.
- ◆ **Biological Control** - This method of control is the introduction of insects or diseases that attack or infect a specific weed species. Biological control agents can be difficult to obtain, and in some cases they are in the testing phase to determine effectiveness. Information regarding the biological control of weeds can be obtained through the Alberta Research Council in Vegreville, Alberta.

Authorities

Weed Control Act - provincial legislation describing weed control and management requirements.

Weed Designation Regulation - lists weed species designated as restricted, noxious and nuisance in Alberta.

Forests Act - describes the requirements with respect to forest allocation.

Cross - Reference

- ◆ **FPD Policy 16.0 - Restricted and Noxious Weed Management Jurisdiction**
- ◆ **Land and Forest Service "Forest Management Herbicide Reference Manual"**

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Approved

Appendix 4 - Glossary

Alberta	The Department of Sustainable Resource Development, including the Forestry Division, Fish and Wildlife Division, and Lands Division or as amended from time to time.
Alberta Vegetation Inventory (AVI)	An inventory of vegetation and forest stands including non-vegetated areas.
Analysis	A detailed examination of a body of data, a series of decisions, or the implications of one or more policies, and a determination of what this examination reveals about the nature, function and/or relationships in effect.
Annual allowable cut (AAC)	The volume of timber that can be harvested under sustained-yield management in any one year, as stipulated in the pertinent approved forest management plan. In Alberta it is the quadrant cut divided by the number of years in that quadrant, usually five.
Annual Operating Plan (AOP)	A plan prepared and submitted by the forest operator each year, which provides the authorization to harvest. An AOP is a requirement of the Timber Management Regulation. (see section B 1.4)
Approval	Issued by Alberta. Approval Decision is prepared outlining significant items considered in plan approval and outlining conditions to be met within specified time periods by the Organization or a decision made by Alberta on an AOP.
As built harvest boundary	An opening number accompanied by a spatial depiction of the harvest area generated either from cutover photography or from GPS technology capable of 3m or better accuracy.
Assumptions	A judgmental decision made by a planner or decision maker that supplies missing values, relationships, or societal preferences for some informational component necessary for making a decision.
Audit	An official examination and verification of records, activities, accounts, actions, operations, etc., against stated standards of performance and compliance.
Bared soil	Any soil where the organic layers and vegetation have been removed.
Borrow pit	A small quarry or excavation, which provides material for use in the construction project. [Revised from Dunster]
Buffer	Used in several contexts. 1 In protecting critical nesting habitat areas, the buffer is an area of forest land that reduces the impacts of adjacent activities on the critical area. The dangers associated with adjacent disturbances might include wind-throw or wind damage to nest trees and young birds in the nest, increased predation and loss of interior forest conditions. 2 A strip of land between two areas under different management regimes. Pesticide buffer zones are used to limit the possible drift, run-off or leachate of pesticide from a site into other areas, such as waterbodies or creeks. Streamside buffers are used to limit the effects of logging on creeks, such as siltation, loss of shading, loss of nutrient inputs from trees and degradation of riparian zones. The size and composition of the buffer zone depends on its intended function. 3 An area maintained around a sample or experimental plot to ensure that the latter is not affected by any treatment applied to the area beyond the buffer. 4 In GIS work, a new polygon computed on distance from a point, line or existing polygon. 5 In managing biosphere reserves, an area or edge of a protected area. Examples of compatible activities might include tourism, forestry, agroforestry, etc. The objective of the buffer zone is to provide added protection for the core reserve area. [Dunster]
Coarse filter	Conservation of land areas and representative habitats with the assumption that the needs of all associated species, communities, environments and ecological processes will be met. [Dunster]
College	The College of Alberta Professional Foresters (CAPF) or the College of Alberta Professional Forest Technologists (CAPFT).
Commercial Thinning	A partial cut where trees of a merchantable size and value are removed to provide an interim harvest while maintaining a high rate of growth on the remaining, well-spaced, final crop trees. Used to capture volume likely to succumb to competition pressures and be lost to disease, insect, or dieback.
Commercial timber permit (CTP)	A timber disposition issued under Section 22 of the Forests Act authorizing the permittee to harvest public timber.
Compaction	A transfer of wheel pressure to soils causing collapse of large air-filled pores, a type of

	disturbance when tire imprint is often invisible under the duff layer. Soil susceptibility to compaction is maximal when soil is at field capacity, which can be detected by stability of hand cast. Most of soil compaction occurs during the first passes of equipment because soil gains strength with each additional pass.
Compartment	A subsection of an FMA for which operational plans are developed.
Connectivity	A measure of how well different areas (patches or a landscape are connected by linkages, such as habitat patches, single or multiple corridors, or "stepping stones" of like vegetation. The extent to which conditions among late successional/climax forest areas provide habitat for breeding, feeding, dispersal and movement of late successional - or climax-dependent wildlife or fish species. Natural landscapes often tend to be better connected than those that have been heavily influenced and disturbed by human activities. Consequently, there is a body of opinion that the best way to avoid fragmentation of landscapes is to maintain, or re-establish, a network of landscape linkages. At a landscape level, the connectivity of ecosystem functions and processes is of equal importance to the connectivity of habitats. [Dunster]
Constraints	The restriction, limiting, or regulation of an activity, quality or state of being to a predetermined or prescribed course of action or inaction. Constraints can be a result of policies or political will; management direction, attitudes and perceptions; or budget, time personnel and data availability limitations; or, more typically, a complex interaction of all these factors. [Dunster]
Corridor	1 A physical linkage connecting two areas of habitat and differing from the habitat on either side. Corridors are used by organisms to move around without having to leave the preferred habitat. A linear habitat patch through which a species must travel to reach habitat more suitable for reproduction and other life sustaining needs. Many corridors, linking several patches of habitat, form a network of habitats. The functional effectiveness of corridors depends on the type of species, the type of movement, the strength of the edge effects and its shape. 2 An area of uniform width bordering both or one side of a lineal feature, such as a stream or route. [Dunster]
Cross-drainage structures	Culverts or other drainage structures that permit water to move from one side of a road to the other, normally under the road grade.
Deactivation	Taking a road out of active use through implementation of erosion control measures, road blocks and/or other methods.
Deciduous timber allocation (DTA)	A quota of deciduous timber.
Delegated Authority	The ESRD personnel located at the Regional or Area level charged with supervision of all forest management activities in a defined Region or Area. It can also mean someone who is authorized to approve an AOP.
Deleterious material	Section 34(1) of the Fisheries Act defines "deleterious substance" as: (a) any substance that, if added to water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water; or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
Department License of Occupation (DLO)	A disposition issued by Alberta authorizing occupation of a linear corridor, often for an access road.
Desired Future Forest	A spatially explicit projected range of conditions of the forest landscape 100+ years into the future. The range of forest conditions defines the goal towards which forest management will be directed. It is our best guess today on the arrangement of forest age classes, roads and habitats that will provide for a set of objectives and desired outcomes that have been identified for the area.
Displaced soil	Mixed mineral, surface and sub-surface horizons that have been deposited off the road or disturbed surface to a depth of 15 cm or greater.

Disturbance patterns	The spatial and temporal arrangement of disturbances.
Ditch blocks	Barriers constructed across ditches to retard water flow, to redirect water from the ditch or to form a small catch basin.
Drought	Extended period of below average precipitation causing a lowering of the water table. Generally occurs over several years but locally may happen seasonally. Signs would be lowering of lake levels and drying of streams that would normally flow all year.
Due Diligence	<ul style="list-style-type: none"> - taking and documenting steps to ensure that the desired outcome is achieved or that the chances of a negative consequence or outcome is minimized; - ensuring completeness, correctness, consistency and repeatability; - demonstrating how conclusions were reached; - using mechanisms, such as but not limited to checklists and standard operating procedures, to demonstrate that appropriate procedures were followed and to ensure that no relevant steps or considerations were missed; - keeping and maintaining appropriate files and filing systems as well as document retention policies and practices.
Duff	The organic horizons of the soil profile (LFH). Commonly referred to as the forest floor.
Dwarf mistletoe	<i>Arceuthobium americanum</i> Nutt.
Ecological integrity	The quality of a natural, unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species and ecosystem diversity assured for the future. [Dunster]
Environmental field report (EFR)	A document that must be submitted for most green area disposition applications as required under the Public Lands Act. The disposition applicant completes the EFR, which includes details on construction practices and environmental issues, and contains operating conditions that apply to the approved disposition. The EFR forms part of the approval for the Public Lands Act disposition.
Features	The features represented on a map which describe the physical aspects of the harvest design. e.g., harvest area boundaries, roads, buffers, wildlife habitat.
FireSmart Community Zone	A standard 10 kilometre radius around the community extending from the Wildland Urban Interface Zone. A unique data set will be gathered for this zone for community protection planning to provide a fundamental linkage between FireSmart Communities and FireSmart Landscapes.
FireSmart Landscape Zone	This zone extends beyond the FireSmart Community Zone overlapping multiple jurisdictions at a broad landscape level. This zone focuses on mitigating the likelihood of large, high intensity, high severity fires. Fire, Forest and Land Management planning are integrated and designed to reduce the negative ecological, economic and social impacts of wildfire while maximizing the positive attributes of wildfire.
FireSmart Landscapes	The philosophy that seeks to mitigate the likelihood of large, high intensity and high severity fires. FireSmart landscapes are designed to recognize the interaction between ecological, economic and social impacts, hence maximize the positive ecological impacts and minimize the negative economic and social impacts.
Floodplains	Flat land bordering a stream or river onto which a flood will spread. The underlying materials are typically unconsolidated and derived from past stream transportation activity. The extent of the floodplain varies according to the volume of water, and its 50-year-old floodplain would be defined by the largest flood that would, on average, occur once within a 50-year-period, estimated from historic stream flow records. [Dunster]
Forest Health	A condition of the forest; a forest is considered healthy if it can sustain itself to meet the specific forest land management objectives of today or in the future.
Forest Management Agreement (FMA)	<p>A contract between the province of Alberta and the FMA holder whereby the province provides an area-based Crown timber supply. In return, the FMA holder commits to the following:</p> <ul style="list-style-type: none"> - managing the timber resource on a perpetual sustained yield basis, taking into consideration a broad range of forest values in determining forest management practices; - meeting defined economic objectives, including capital investment and job creation, and seeking out new business opportunities that provide measurable economic benefits for both the province and the FMA holder. <p>The FMA gives the FMA holder the right to access Crown fibre. In return, the FMA holder</p>

	commits to forest management responsibilities, which may change from time to time.
Forest Management Unit (FMU)	An administrative unit of forest land designated by the Minister, as authorized under Section 14(1) of the <i>Forests Act</i> .
Forest operations	Includes all activities related to timber harvesting, including site assessments, planning, road construction, harvesting, reclamation and reforestation.
Forest operator	The timber disposition holder or person responsible for controlling harvest planning and operations in the timber disposition. It also refers to those persons working on behalf of the disposition holder while conducting forest operations.
Forest tent caterpillar	<i>Malacosoma disstria</i>
Forests Act, the	The legislative statute that authorizes the Minister to administer and manage the forested lands of Alberta.
Full Review	An evaluation of the acceptability for approval of a submitted document involving referrals to government departments, independent experts, or others as appropriate, and a risk analysis prior to Alberta granting approval to the submitting Organization.
Genetic Diversity	The genetic variability within a population or a species; the number and relative abundance of alleles. Genetic diversity can be assessed at three levels: - diversity within breeding populations; - diversity between breeding populations within any one geographic area; - diversity within the species.
Grazing disposition	An authorization issued by Alberta for the purpose of domestic livestock grazing on public land (i.e., lease, license or permit).
Ground Rules	Standards for operational planning and field practices that must be measurable and auditable and based forest management plan objectives.
Guideline	A preferred or advisable course of action respecting land and resource management. Guidelines imply a degree of flexibility, based on administrative judgment or feasibility of applying the guideline, and are consequently not normally enforceable through legal means.
Harvest area	A specified land area with defined boundaries where timber harvesting is scheduled, or has occurred (commonly referred to as a cut block).
Harvest Level	A volume or area of timber determined through timber supply analysis available for harvest on an annual sustainable basis within a DFA. A harvest level is not an AAC unless approved by the Minister.
Hiding cover	See " <i>sight distance</i> ".
High-water mark	Stream course water levels corresponding to the top of the unvegetated channel or lakeshore.
Historical resource	Any work of nature or man that is primarily of value for its palaeontological, archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including, but not limited to, the structure or object and its surrounding site.
Insects and Diseases	Biological, physiological, and environmental agents that have an adverse effect on the health of the forest. These agents include insects; nematodes; micro-organisms (viruses, bacteria, fungi); parasitic plants; mammals; birds; and non-infectious disorders caused by climate, soil, applied chemicals, air pollutants and other physiographic conditions.
Integrated resource plan	A regional plan developed by provincial government agencies in consultation with the public and local government bodies. It provides strategic policy direction for the use of public land and its resources within the prescribed planning area. It is used as a guide for resource planners, industry and publics with responsibilities or interests in the area.
Jack pine budworm	<i>Choristoneura pinus</i> .
Landing	Any area where logs are gathered for processing or further transport to a mill site.
Landscape	A landscape (or LMU) is a heterogeneous area in which the pattern of the mosaic of local ecosystems or land uses is repeated in similar form throughout kilometres wide area (after Forman 1986). Landscapes may coincide with a climatic, physiographic or ecological boundary. However, landscapes are not strictly ecologically based and include human use and modification of the area.
Large residual tree	A residual tree with a diameter measured at breast height (DBH) greater than the approximate average merchantable tree DBH of the harvest area.
Large woody debris	Woody material > 1 cm in diameter, stumps and snags < 1.3 m tall and dead trees leaning > 45 degrees. The woody material left on site after logging including both pre-existing and harvest-

	generated material (downed boles, limbs, tops and stumps). Includes highly decomposed and vegetated material as long as it is recognizable as woody.
Logfill	Stream crossings constructed with logs placed in a streambed parallel to the flow of the water.
Mature stands	Stands that have reached rotation age or have a decreasing growth rate.
Mountain pine beetle	<i>Dendroctonus ponderosae</i> .
Non-traditional access	Access with conditions on the disposition limiting its use by the public.
Noxious Weed	A plant designated under the Weed Regulation (AR 171/2001) of the Weed Control Act.
Organization	The proponent charged with developing the FMP. This may be a corporation, cooperative, or a public agency.
Partial cutting	A treatment where significantly less than 100% of the trees are harvested from a stand or area. It includes commercial thinning, even when the intention is leading to a final clearcut.
Pattern	The arrangement of forest stands or harvest units.
Permanent roads	Roads that will be in use for more than five years.
Permanent sample plots (PSP)	A fixed or variable area plot established for (forest) sampling and measurement purposes, and designed for remeasurement.
Pre-commercial Thinning	A silvicultural treatment to reduce tree density in young stands, carried out before the stems reach merchantable size. The intent is to concentrate the site's growth potential on fewer trees thereby accelerating stand development and reducing the time to final harvest, retaining more live crown, creating opportunities for future commercial thinning activities and improving stand operability.
Prescribed burn	The planned use of carefully controlled fire to accomplish predetermined management goals (e.g., site preparation for planting, reduction of fire hazards or pest problems, improvement of the ease with which the site can be traversed, and creation of better quality browse for wildlife). [Dunster]
Prohibited debris	Any flammable debris or waste material that, when burned, may result in the release of dense smoke, offensive odours or toxic air contaminants. It includes: (a) garbage or refuse from commercial or industrial operations; (b) rubber or plastic, or anything containing or coated with rubber or plastic or similar substances; (c) used oil from internal combustion engines, hydraulic oil and lubricants (d) Motor vehicle tires.
Quota	The timber quota is a share of the allowable cut of coniferous timber within a forest management unit.
Reclamation of roads	Permanent removal of watercourse crossings; re-contouring of road crown and ditches; reseeding or planting of the former right-of-way.
Recreation Site	Includes areas designated by Alberta as Ecological Reserves, Wilderness Areas, Wildland Parks, Provincial Parks, Heritage Rangelands, Natural Areas, and Recreation areas.
Regeneration	The renewal of a tree crop by natural or artificial means. It may also refer to the young crop itself.
Regulated Forestry Professional	A Registered Professional Forester (RPF) on the Registered Professional Forester Register of the College of Alberta Professional Foresters (CAPF) or a Registered Professional Forest Technologist (RFPT) on the Registered Professional Forest Technologist Register of the College of Alberta Professional Forest Technologists (CAPFT).
Reserve	In its strictest sense, an area of land designated as being off-limits to any exploitive activities that might change the nature of the area. Not all reserves are so tightly controlled. [Dunster]
Residual structure	Standing structure that is taller than 2 m, within a harvested area. Areas buffered for sensitive ecological or wildlife habitat may be included for residuals. Required buffers for lakes and small and large permanent streams are not included. This includes non-merchantable trees and shrubs, live merchantable trees, snags and stubs.
Residual tree	A live canopy tree that is spatially within a harvested area. Areas buffered for sensitive ecological or wildlife habitat may be included for residuals. Required buffers for lakes, small and large permanent streams are not included.
Resources	Physical and intrinsic features of the land, including but not limited to timber, wildlife, water and soil.
Restricted Weed	A plant designated under the Weed Regulation (AR 171/2001) of the Weed Control Act.

Review	Acceptance or appraisal conducted by Alberta.
Right-of-way (ROW)	A cleared area, usually linear, containing a road and its associated features such as shoulders, ditches, cut and fill slopes, or the area cleared for the passage of utility corridors containing power lines or over- or under-ground pipelines. Typically, the right-of-way is a specially designated area of land having very specific rights of usage attached. Rights-of-way may be owned by someone else. [Dunster]
Riparian area or management zone	(1) The band of land that has a significant influence on a stream ecosystem or is significantly affected by the stream. It often has specialized plant and animal communities associated with it. [Anon] (2) Terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils that exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows. The riparian zone is influenced by, and exerts an influence on, the associated aquatic ecosystem. [Dunster]
Root collar weevils	<i>Hylobius</i> spp.
Rotation	The period of years required to establish and grow even-aged timber crops to a specified condition of maturity.
Ruts	Machine depressions in the soil which are determined by depth and length: - where the depth of the organic dark humus material is greater than 30 cm, a rut is a depression that shears the organic layer of soil (a sheared organic will expose a vertical face greater than 20 cm of the organic layer); - where the depth of the organic material is less than 30 cm, a rut is a depression exceeding 10 cm into the mineral soil; Length: - an impacted area meeting the rut depth criteria that is greater than 4 m long; - a continuous track with a rut less than 4 m because of stumps, logs or rocks lifting the vehicle will still count as a rut if the total length of the smaller holes is greater than 4 m.
Rutting/ puddling	A paste-like behaviour of wet soil when most of the soil pores are filled with water and soil literally flows from underneath the wheel to the sides and upward forming visible tire imprint into the mineral soil. Intensity/depth of rutting is directly related to the number of equipment passes. Soil is considered susceptible to rutting when it forms a stable hand cast.
Sensitive sites	Sites that have soil, water, slope, aesthetic, vegetation or wildlife characteristics that require special protection beyond the normal precautions described in the ground rules. They may be complex if many values or issues are involved.
Seral stages	A stage in succession. A series of plant community conditions that develop during ecological succession from a major disturbance to the climax stage. Most common characteristics/classifications include tree species and age.
Sight distance	The distance at which 90% or more of an adult big game animal is hidden from the view of a human. This distance may vary from one stand to another.
Silt fence	Permeable fabric barriers installed along the contour to filter surface water runoff and trap sediment from sheet or overland flow and prevent it from entering streams.
Silviculture	The theory and practice of controlling the establishment, composition, health, structure and growth of forests in order to achieve specified management objectives.
Site preparation	Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment favourable for survival of suitable trees during the first growing season. Altering the ground cover, soil or microsite conditions can create this environment; using biological, mechanical or manual clearing; prescribed burns; herbicides or a combination of methods. [Dunster]
Skid trail	An unimproved temporary forest trail suitable for use by equipment such as bulldozers and skidders in bringing trees or logs to a landing or road.
Small patch	A patch of less than 0.2 ha of undisturbed canopy forest surrounded by harvested area. The patch must be composed of at least four canopy trees. At least two of the trees in the patch should be large residual trees.
Snag	A dead tree that is taller than 2 m.

Soil Displacement	A loss of nutrient-rich organic layers, and top mineral soil as a result of harvesting activities. Bare mineral soil is susceptible to raindrop impact causing soil crusting, increased surface runoff, and erosion.
Soil disturbance	In the context of the 5% maximum allowable area within a harvest area, includes bared landing areas, temporary roads, displaced soils or ruts.
Spatial	Of, or existing in, space. [Webster's]
Species at risk	Any species known to be "at risk" after formal detailed status assessment and designation as "Endangered" or "Threatened" in Alberta. The list of species is maintained by Alberta.
Species of management concern	Species within the forest management planning area that have an identified value (social, economic, ecological) and are managed to ensure their continued protection and/or use. This includes species that are hunted or trapped, as well as those that are endangered or threatened.
Spruce beetle	<i>Dendroctonus rufipennis</i> .
Stand	A community of trees sufficiently uniform in species, age, arrangement or condition as to be distinguishable as a group in the forest or other growth in the area. A stand may also be that polygon as defined in the AVI or Phase III inventory.
Strippings	Layers of humus-bearing topsoil and fine woody material above mineral soil that have been stripped off during road or landing construction.
Stub	A large residual tree that has been "topped off" at approximately 6 m to create an artificial snag.
Subsequent pass	Any harvest occurring after the first harvest pass.
Suppression capability	The effectiveness of traditional fire suppression tactics. It is an objective evaluation of initial attack response time, access for ground support resources, water availability and terrain which might adversely impact movement of resources.
Sustainable forest management (SMF)	Management to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social and cultural opportunities for the benefit of present and future generations.
Temporal	Of, or limited by, time. [Webster's]
Temporary field authority (TFA)	An authority issued under Section 19 of the Public Lands Act by an Alberta officer to grant short-term land use activities on public land in the White or Green Areas. The TFA may or may not be related to an existing disposition that has also been issued under the Public Lands Act. The concept is to provide field-level service to an applicant, with access to public land for a specific purpose/use/activity, for a term of less than or equal to one year.
Temporary road	Roads that are part of a harvest area or that connect harvest areas, and are built, used and reclaimed before expiry of the Annual Operating Plan (AOP) or reclaimed within five years of construction.
Terrestrial vegetation	Look Up in Dunster – hydrophytic vegetation ends
Thermal cover	Generally, an area of at least 10 ha having a coniferous canopy at least 10 m in height, with at least 70% crown closure and a minimum width of 200 m. This cover is used by animals to assist in their temperature regulation during extreme weather conditions.
Timber disposition	Licenses and permits that allow forest operators to harvest from Crown lands.
Timber Management Regulation	The legislative statute that describes the mechanism and regulations by which the forested lands of Alberta are managed. The Regulation is associated with the Forests Act.
Timber Operations	Includes all activities related to timber harvesting including site assessments, planning, road construction, harvesting, reclamation and reforestation.
Timber supply analysis (TSA)	Calculations/computer models with built-in assumptions regarding forest growth patterns, used to determine the annual allowable cut (AAC).
Timing constraints	A restriction or limitation on when an activity may be carried out.
Trapper	Holder of a trapping license.
Understorey	The trees and other woody species growing under the canopies of larger adjacent trees and other woody growth. [Dunster]
Unstable slope	Slopes of loose or poorly consolidated materials beyond the angle of repose, geological features having a high probability of failure, or soils that will not support loads.
Utilization	The portion of the stand or individual tree used for manufacture of wood products, defined in terms of piece length and diameter at each end. Minimum standards for utilization are defined in the timber disposition.

Validated work (Validation)	Work that has been prepared by, or reviewed and approved by an RFP. These professionals are subject to an enforceable code of ethics and standards of practice and are expected to complete their work with due diligence to ensure such work is accurate. The RFPs who validate the work may have done the work themselves, contracted the work to be done, or supervised those who did the work, but in any case, the validating RFPs are accountable for the work being prepared with due diligence and being accurate. If more than one RFP is involved in preparing the work, the RFP that is most directly involved in the work is to validate the work.
Values at risk	A listing of values which may be at risk of being reduced by wildfire. In order to complete a spatial “priority” evaluation, information regarding values is required.
Variance (SHS)	Any deletion to a stand scheduled in the spatial harvest sequence. Additions to stands identified in the spatial harvest sequence are not considered variance but are tracked in section 3.4.1 of the ground rules.
Viable understorey	Trees of desirable merchantable species that are windfirm and of sufficient vigour that they will continue to grow after harvest.
Water source area	That portion of a watershed where soils are water-saturated and/or surface flow occurs and contributes directly to streamflow. The area of saturated interflow associated with a stream.
Watercourse	The bed, bank or shore of a river, stream, creek or lake or other natural body of water, whether it contains or conveys water continuously or intermittently.
Watershed	An area of land, which may or may not be under forest cover, that drains water, organic matter, dissolved nutrients and sediments into a lake or stream. The topographic boundary, usually a height of land, that marks the dividing line from which surface streams flow in two different directions. [Dunster]
Western gall rust	<i>Endocronartium harknesii</i> .
Wildlife	Any species of amphibian, bird, fish, mammal and reptile found in the wild, living unrestrained or free roaming and not domesticated. Some definitions include plants, fungi, algae and bacteria. [Dunster]
Wildlife corridor	A strip of forest with a minimum width of 100m or a series of forest retention patches that connect two forested areas. These may include merchantable or unmerchantable stems.
Wildlife zone	As defined on Fish and Wildlife Referral Maps.
Windfirm	The ability of a tree or stand of trees to remain standing post harvest.
Yield Curve	Graphical representation of a yield table.

List of Initialisms

AAC	Annual Allowable Cut
AOP	Annual Operating Plan
ARS	Alternative Regeneration Standard
ARIS	Alberta Regeneration Information System
AVI	Alberta Vegetation Inventory
CA	Compartment Assessment
CAPF	College of Alberta Professional Foresters
CAPFT	College of Alberta Professional Forest Technologists
CNT	Connotative Notation
CT	Commercial Thinning
CTPs	Commercial Timber Permits
DHAP	Detailed Harvest Area Plan
DFMP	Detailed Forest Management Plan
DRS	Departmental Reserve
DTPs	Deciduous Timber Permits
EFR	Environmental Field Report
ESRD	Environment and Sustainable Resource Development
FGL	Forest Grazing Lease
FERIC/FP Innovations	Forest Engineering Research Institute of Canada
FHP	Forest Harvest Plan
FMA	Forest Management Agreement
FMP	See definitions - Forest Management Plans (generic)
FMU	Forest Management Unit
FPPA	Forest and Prairie Protection Act
FWMIS	Fish and Wildlife Management Information System
GDP	General Development Plan
ILM	Integrated Landscape Management
IRP	Integrated Resource Management Plan
LFS	Land and forest Service
DLO	License of Occupation
LSAS	Land Status Automated System
NSR	Not Satisfactorily Restocked
OGRs	Operational Ground Rules
PCT	Pre-commercial Thinning
PNT	Protective Notation
PSPs	Permanent Sample Plots
QAC	Quadrant Allowable Cut
RFMA	Registered Fur Management Areas
RFP	Regulated Forestry Professional
ROW	Right of Way
RPF	Registered Professional Forester
RPFT	Registered Professional Forest Technologist
SHS	Spatial Harvest Sequence
TFA	Temporary Field Authority
TMR	Timber Management Regulation made under the Forests Act
TSA	Timber Supply Analysis

Appendix 5 – Forest Harvest Plan (FHP) and Annual Operating Plan (AOP) Checklists

Forest Harvest Plan Checklist				
Area _____ Company _____ Submission Date _____	Disposition Number _____ Date Disposition Issued _____ Date Disposition Expires _____			
APPROVAL ITEM	Yes/No (Company)	INITIAL/DATE (ESRD)		
Validated by a RFP				
Planned SHS Variance <20% compartment/decade				
Sum of proposed area to harvest and previously harvested area does not exceed 100% of the SHS area				
Compartment Assessment required				
Adheres to all Ground Rules				
	Company (Y,N,N/A)	Company Comments (optional)	ESRD (Y,N,N/A)	ESRD Comments (optional)
Administrative Considerations				
<ul style="list-style-type: none"> · Copies of FHP to: <ul style="list-style-type: none"> - Senior Forester - Forest Officer - Fish & Wildlife - Other · FHP consistent with approved higher order plans (DFMP, SHS, GDP) · Other forest operators affected by the FHP have agreed in writing with the FHP before it is submitted for approval · Required disposition been issued and is active · FHP complete and legible <ul style="list-style-type: none"> - maps - block tables - detailed block plans where requested - contingency plans · Additional requirements as per regional OGR <ul style="list-style-type: none"> - approved SHS & variances - proposed and laid out cut blocks - orthophoto or the approved forest inventory - laid out class I – IV inter-block roads and Department License of Occupation (DLO) roads for the purposes of timber operations - current dispositions and reserves (e.g., registered trapline boundaries, permanent sample plot (PSP) locations) - watercourses and their classifications - identified springs, water source and seepage areas - locations of access control measures - planned watercourse crossing locations for channelled watercourse crossings - current information on previously harvested areas and unless otherwise addressed, existing trails, seismic lines, power lines, pipelines and access routes - sensitive wildlife sites as per section 7.7.4 · Additional comments as per 3.3.10 · Detailed harvest area plans as per 3.3.11 				
Ground Rule Deviations - Complete if answered "NO" to above				
<ul style="list-style-type: none"> · All the blocks containing ground rule deviations been identified · Explanation and justification has been provided for all ground rule deviations 				
Integration with Other Users.				
<ul style="list-style-type: none"> · If the plan is not integrated, explanation and justification has been provided · Recipient of incidental volumes and chargeability has been identified · Trappers been identified and contacted · Trapper cabins, trails and other improvements have been identified and integrated into the plan · Recreational groups have been identified and contacted where issues have been observed · Grazing disposition holders have been contacted (Directive 2006-01) · Known Historical sites have been identified and integrated into plan · Any issues raised by other users or the public regarding this plan have been documented · Potential land use conflicts have been documented and mitigated (PNT, CNT, road use agreements, etc.) 				

Access Management			
· Access management including control measures have been described and identified (location and methods)	_____	_____	_____
Sensitive Sites			
· Aesthetic concerns addressed as per 5.5	_____	_____	_____
· Recreation concerns addressed as per 5.2	_____	_____	_____
· Water source areas have been identified and potential impacts mitigated	_____	_____	_____
Road Design			
· Location and road class of corridors have been identified	_____	_____	_____
· Existing access/DLOs which have been integrated into the plan have been identified on the map	_____	_____	_____
Wildlife			
· Wildlife zones within the planning area are identified and addressed (as per OGR Section 7.7)	_____	_____	_____
· Harvest areas with timing restrictions identified	_____	_____	_____
· All known sensitive wildlife sites have been identified and treated as per 7.7.4.2	_____	_____	_____
Insect, Disease & Fire			
· FHP complies with direction provided in Community Firesmart Plans	_____	_____	_____
· Identification and mitigation measures of infestation for diseases or endangered timber are described	_____	_____	_____
· Have mitigation strategies for infestation, diseases or endangered timber been described? If there are none, enter N/A.	_____	_____	_____
Silviculture			
· Pre-harvest strata declaration has been included for each opening	_____	_____	_____
<p>-FHP's are approved through acceptance and will be considered approved on the date Alberta acknowledges receipt of the work. -Alberta shall notify the organization by acknowledging receipt within 5 working days of submission. -The notification date will be documented by Alberta as the start date for FHP approval. -Alberta shall periodically check the work and supporting documentation to verify its accuracy. -At any time, approval can be revoked where Alberta learns the FHP is inaccurate or deficient in content.</p>			
Company Validation			
_____	_____	_____	_____
Submitting RFP Validation	Company		Date
ESRD Validation			
_____	_____	_____	_____
Reviewing RFP Validation			Date

Note: This Checklist should reflect regional or FMA Operating Ground Rules - this is a template.
Note: Appraisal of the FHP is required if "No" has been indicated on any of the above Approval Items.

Annual Operating Plan (AOP) Checklist

Area _____ Company _____ Disposition Number _____ Date Disposition Issued _____ Date Disposition Expires _____ Submission Date _____	Volume Summary (m³) Quadrant Allowable Cut _____ Quadrant Production to date _____ Quadrant Volume Remaining _____ Proposed Production (AOP year) _____	Conifer _____ _____ _____	Deciduous _____ _____ _____
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APPROVAL ITEM	YES/NO (Company)	INITIAL/DATE (ESRD)
Validated by RFP		
AOP has approved FHP(s)		

	Company (Y,N,N/A)	Company Comments (optional)	ESRD (Y,N,N/A)	ESRD Comments (optional)
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Administration

- Have digital copies of AOP been provided to:
 - Area/SeniorForester
 - Forest Officer
 - other
- FHP conditions have been addressed
- Company is requesting dues relief with an explanation and justification
- Opening update verification has been submitted - all blocks logged in the previous year cross referenced against the ARIS report
- Amendments to AOP components have been submitted and justified (reforestation program, GDP, FHP)

Operating Schedule (as per section 3.4.4 c)

- Table submitted for all blocks scheduled for harvest including area & volume by species with totals
- List of roads proposed for construction, maintenance & reclamation including watercourse crossings to be built or installed or removed/maintained provided
- Declaration of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items provided
- Outstanding operations identified (debris disposal, hauling, clean-up, reclamation, etc)

Applicable Forest Harvest Plans (as per section 3.3)

- All blocks included in the AOP have FHP approval
- Utilization standard matches tenure document

Reforestation Program (as per section 8.2)

- Silviculture prescription acceptable as per Silviculture table
- Silviculture treatment schedule
- Reported as per Strata Balancing Directive (2005-01)
- Watercourse crossings used for silviculture purposes identified
- Seed inventories sufficient as per FGRMS manual section 11.2 or otherwise approved by ESRD

Road Plan (as per section 11.2)

- Existing access and DLO integrated into plan are identified
- All required watercourse crossings documented in the monitoring program as per section 11.4.26

General Development Plan (as per section 3.2)

- Describes volume supply by areas, road standards and construction and reclamation schedules
- Other forest operators affected by the GDP have agreed in writing to the GDP prior to approval (see section 5.1.1)
- Table tracking the status of all planned DLO roads submitted
- GDP requirements as per 3.2.5 have been met

Company Sign Off

_____ Submitting RFP Validation _____ Company _____ Date

ESRD Sign Off

_____ Reviewing RFP Validation _____ Date

Note: The AOP shall be appraised by Alberta in accordance to the AOP checklist, with approval subject to the outcome of the appraisal.