



**Forest Management Unit F23 Timber Harvest Planning and
Operating Ground Rules**

2018

FOREST MANAGEMENT UNIT (FMU) F23

TIMBER HARVEST PLANNING AND OPERATING GROUND
RULES

ALBERTA
AGRICULTURE and FORESTRY

ENDORSEMENTS

The Forest Management Unit (FMU) F23 Operating Ground Rules, having been prepared in accordance with Section 98 (2) of the Timber Management Regulation and hereby endorsed this 16th day of May, 2018.

HER MAJESTY THE QUEEN in right of Alberta as represented by the Minister of Agriculture and Forestry

Original Signed

Per:

Darren Tapp

(print name)

Executive Director, Forest Management Branch

(title)

Forest Management Unit F23 and Operating Ground Rules
Revisions from 2009 to 2018
(Effective Date: June 1, 2018)

2018 Revisions

Ground Rule Number	2009 Version of the Ground Rule	2018 Version of the Ground Rule
General	Some edits were made outside of the review 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.	
3.3.1	The GDP submission date is June 1 of each year unless otherwise approved by Alberta.	The GDP submission date is on or before June 1 of each year unless otherwise approved by Alberta.
3.4.1 b)	deletes less than 20% of the area sequenced in the SHS/strata description table (SDT), by compartment per decade;	variances of less than 20% of the area sequenced in the SHS/strata description table (SDT), by compartment per decade;
3.4.7.1	For class III and IV with lifespans up to five years from start of construction road design and location shall be described for external temporary roads joining harvest areas that are to be constructed.	For class IV with lifespans up to three years from start of construction, road design and location shall be described for external temporary roads joining harvest areas that are to be constructed.
3.4.9 g)	planned harvest areas exceeding maximum block sizes as defined in section 7.2, or harvest areas exceeding 100 ha in the SHS;	Deleted
3.5.1	The AOP submission date is June 15 for summer operations and September 15 for winter operations. Alberta shall respond within 30 days. The AOP shall be reviewed by Alberta with approval subject to the outcome of the review.	The AOP submission date is on or before June 15 for summer operations and on or before September 15 for winter operations. Alberta shall respond within 30 days. The AOP shall be appraised by Alberta with approval subject to the outcome of the review.
3.6 Salvage Planning (discussion)	Added	See Directive 2007-01 for further direction on Salvage Planning.
4.2.6	Added	Company processing practices cannot make an unmerchantable piece from a merchantable tree or merchantable piece.
5.1.4	FHPs affecting recreational sites shall provide opportunities for the enhancement of existing recreational trail and road systems whenever possible, while adhering to the provincial Motorized Access Management Policy on Industrial Dispositions.	FHPs affecting recreational sites shall provide opportunities for the enhancement of existing recreational trail and road systems whenever possible.
5.3.1	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

Ground Rule Number	2009 Version of the Ground Rule	2018 Version of the Ground Rule
		Manual as well as Directive SD 2011-03.
6.0 Watershed Protection (discussion)	The FMP shall address watershed water quantity and flow issues. Ground rules define operating practices to protect water quality and riparian values.	The FMP typically addresses watershed water quantity and flow issues. In lieu of an approved FMP, these ground rules define operating practices to protect water quality and riparian values.
6.0.6	Unless otherwise approved in an FMP, variances from the standards in Table 2, must demonstrate that aquatic and terrestrial objectives are met.	Variances from the standards in Table 2 must demonstrate that aquatic and terrestrial objectives are met.
Table 1. Watercourse Classification (Small Permanent)	Banks and channel well-defined; Channel width from greater than 0.7 m to 5 m	Banks and channel well-defined; Channel width from greater than 0.5 m to 5 m
Table 1. Watercourse Classification (Transitional Watercourse)	N/A	Deleted
Table 1. Physical Description (Water Source Area)	Areas with saturated soils, surface flow or seepages	Areas with saturated soils, surface flow or seepages contributing directly to stream flow
Table 2. Standards and Guidelines (Transitional Watercourse)	N/A	Deleted
7.2.1	A PHP shall be developed and submitted for approval by Alberta which incorporates a two-pass harvest system, or multiple entry system where agreed to.	Deleted
7.2.1.1 to 7.2.1.3	7.2.1.1 A PHP shall be completed and approved by Alberta in the absence of an SHS. 7.2.1.2 The preliminary harvest plan will verify merchantable and unmerchantable timber types. 7.2.1.3 Harvest area design and layout as in section 7.2.	Deleted

Ground Rule Number	2009 Version of the Ground Rule	2018 Version of the Ground Rule
7.2.1.4	<p>Maps shall accurately show the following information:</p> <ul style="list-style-type: none"> a) the approved forest inventory; b) area (ha) and coniferous and deciduous volume for each proposed harvest and reserve area; c) all proposed roads within the harvest area boundaries; d) current dispositions and reserves (e.g., registered trapline boundaries, PSP locations); e) watercourses, their classifications and protective buffers; f) the location of all known springs, water source, and seepage areas; g) road corridors and LOC numbers and classes for both existing and proposed roads; h) planned water course crossing locations; i) current information on previous harvest areas, existing trails, seismic lines, power lines, pipelines and access routes; j) sensitive wildlife areas as per section 7.7.6.2; k) mark known important wildlife sites (e.g., mineral licks, nesting sites, denning and birthing sites); l) proposed integrated harvest areas. 	Deleted
7.2.1.5	<p>Road design and location shall be described for all roads joining harvest areas, and LOC roads to be constructed for extraction of timber from all proposed harvest areas. These road comments include the following:</p> <ul style="list-style-type: none"> a) road design and classification; b) choice of corridor location and width; c) considerations made for other road users; d) considerations made for non-timber users; e) integration of existing roads into the design. 	Deleted
7.2.1.6	<p>Where two or more overlapping timber dispositions shall be harvested, the respective companies shall cooperatively develop an integrated harvest plan.</p>	Deleted
7.2.2	<p>Where a two-pass harvest is planned, all timber stands in a timber disposition that currently meet the merchantability standards and are near, at, or older than rotation age shall be included in the harvest design. No more than 50% of the merchantable area shall be in first pass blocks.</p>	Deleted
7.2.3	<p>Irregular or natural boundaries shall be employed in the FHP harvest area design. New harvest designs in areas previously harvested shall create natural boundaries.</p>	Deleted

Ground Rule Number	2009 Version of the Ground Rule	2018 Version of the Ground Rule
7.2.7	Timber harvesting shall not occur on any area where the likelihood of soil water table increases following harvesting is high, and the risk that the reforested area will not achieve the regeneration standard is also high.	Deleted
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.	Slash accumulations resulting from timber harvesting, road, and campsite construction shall be disposed of within 12 months after harvesting operations are complete in a manner acceptable to Alberta.
7.3.3	<p>Burning operations shall :</p> <ul style="list-style-type: none"> a) not be conducted during the fire season, unless otherwise approved in the Fire Control Plan in the AOP; b) not commence until notification to the Wildfire Management Area of Forest Protection Branch has occurred; c) require a post burning survey to ensure piles are extinguished. Survey to be submitted to the Wildfire Management Area of the Forest Protection Branch with notification to the Public Lands and Forests Divisions. 	<p>Burning operations shall :</p> <ul style="list-style-type: none"> a) not be conducted during the fire season, unless otherwise approved through a Burning Permit; b) not commence until notification to the Forest Area has occurred; c) require a post burning survey to ensure piles are extinguished.
7.4.2	Added	Volume targets for structure retention will vary by harvest area. A target of 2% merchantable coniferous volume and 2% merchantable deciduous volume will be retained within harvest areas across the overall landscape of FMU F23.
7.4.2.1 to 7.4.2.3	Added	<p>7.4.2.1 Any patches identified as retention shall not be harvested until the next rotation.</p> <p>7.4.2.2 Retention shall be within the harvest block boundary, except where approved by Alberta.</p> <p>7.4.2.3 Retention contributing to the target in 7.4.2 can only be from the net landbase (e.g. retention from buffers on watercourses or steep slopes do not contribute).</p>

Ground Rule Number	2009 Version of the Ground Rule	2018 Version of the Ground Rule
7.7.6 (Arctic Grayling)	Added	<p>Locations of existing arctic grayling can be identified using the Fisheries and Wildlife Management Information System (FWMIS), and the associated Fish and Wildlife Internet Mapping Tool (FWMIT). Within or adjacent to known locations:</p> <p>7.7.6.1 Operational planning by the company should incorporate the use of Alberta’s Wet Areas Mapping tool to identify areas that are sensitive to disturbance. Field confirmation of these sites including depth to water, potential disruption of groundwater flows, and areas at high risk of erosion in wet or riparian areas can be a useful tool in determining road and crossing location.</p> <p>7.7.6.2 Detailed harvest area plans (DHAP) for operations shall be submitted (as per 3.4.9).</p> <p>7.7.6.3 Unless otherwise approved, all operations should occur outside the restricted activity period (RAP) of April 16 to July 15. Early winter operations are preferred; and during dry or frozen conditions are best.</p> <p>7.7.6.4 Site preparation activities within 100 meters of watercourses must prevent input of sedimentation.</p>
11.1.2	All roads, regardless of class, with a lifespan of greater than five years shall be built under the authority of an LOC.	All roads, regardless of class, with a lifespan of greater than three years shall be built under the authority of a DLO.

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1.0 GROUND RULE SCOPE

Ground rules are the practices used in planning and conducting timber harvesting operations which constitute the methods used to implement 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 must seek advice and approvals of the federal agencies (Department of Fisheries and Oceans, Environment Canada) regarding federal legislation requirements.

The Delegated Authority 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, request for ground rule waivers shall be in writing and must conform to departmental policy, the Forests Act, the Timber Management Regulation, the Public Lands Act and all other 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 document 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, clear, specific, measurable, understandable and achievable.**

3.0 OPERATIONAL PLANNING

3.1 PLANNING PROCESS

PURPOSE

The operational planning process is designed to expedite the implementation of the FMP. Where management direction has not been established through an approved FMP, then required decisions shall be made during this operational planning process.

DISCUSSION

The planning process includes five main components:

1. **Approved Forest Management Plan (FMP)**
 - Spatial Harvest Sequence (SHS) for first 20-years
 - Approved Long Term Road Network.
2. **Compartment Assessment (CA)** - 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 CA describing current issues, shall be required (see section 3.2).
3. **General Development Plan (GDP)** - The GDP gives a projection of a forest operator's proposed harvest strategy, road building plans, and reclamation operations for a five-year period, and includes all licenses and permits. The GDP is used to guide integration of activities. (see section 3.3)
4. **Forest Harvest Plan (FHP)** – The FHP is a map and associated report describing the laid out harvest plan (see section 3.4).
5. **Annual Operating Plan (AOP)** – The AOP describes operations in detail through a series of components that shall be submitted together at the same time, or as individual submissions on a schedule approved by Alberta:
 - a) Operating Schedule and Timber Production;
 - b) Applicable FHPs;
 - c) GDP;
 - d) CAs as required;
 - e) Reforestation Program;
 - f) Fire Control Plan;
 - g) Road Plan.(see section 3.5)

3.2 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 analyze and possibly adjust the FHP(s) 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/compartment/decade as determined by the area manager and the manager of Forest Management Branch (FMB)). Potential decisions include a CA analyzing the impact on a particular issue, an immediate review of the timber supply analysis (TSA) or a deferral of impacts until they are addressed in the next detailed forest management plan (DFMP) if applicable. The CA shall describe how the new issues will be incorporated into the FHP. The CA provides an opportunity to reconsider management strategies at the time of operational planning if warranted.

GROUND RULES

- 3.2.1 Alberta shall decide on the boundaries and scope on which a CA is required after consultation with the forest disposition holder. The CA shall include any maps, analyses, and reports deemed necessary by Alberta to adequately address the issues. Deliverables and timelines will be identified within the request for a CA.**
- 3.2.2 If a CA is required, the operator must receive Alberta's approval for the CA prior to the submission of an FHP affected by the CA.**
- 3.2.3 A CA is considered current if it has been approved by Alberta and the FHP is submitted to Alberta within three years of approval.**
- 3.2.4 Where a CA is required on an area covered by an approved FHP, Alberta shall consult with the company on any changes required to that FHP.**

3.3 GENERAL DEVELOPMENT PLAN (GDP)

PURPOSE

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

- guide the integration of activities;
- schedule timber disposition administration activities;
- predict cut control status;
- 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 and a summary of variance from the SHS for existing FHPs or 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.

In addition to outlining the projected wood supply forecast, the GDP shall also include details regarding road requirements, and fish and wildlife issues within the planning area. It is expected that there will be substantial discussion on significant issues with Alberta before the FHP is submitted. Consultation of the GDP with First Nations is a requirement of the Aboriginal Consultation Guidelines.

GROUND RULES

- 3.3.1 The GDP submission date is on or before June 1 of each year unless otherwise approved by Alberta. Alberta shall respond within 30 days. The GDP shall be approved subject to an appraisal by Alberta.
- 3.3.2 The GDP shall contain a summary of any proposed variances from the harvest sequence and long-term road plan in the FMP. Variances must be approved by Alberta (see section 4.1.1).
- 3.3.3 It is expected that there will be substantial discussion to resolve significant issues with Alberta before the FHP is submitted.
- 3.3.4 Proposed over-cuts shall not be approved.
- 3.3.5 When a major change in a company's general development strategy is proposed after the GDP is received, a revision may be requested by Alberta where the change may affect issuance of dispositions, the orderly review of AOPs, or integration with other forest operators.
- 3.3.6 The GDP consists of the following:
 - 1. Schedules with the following information:
 - a) the volume to be harvested each year by operating unit by disposition for the next 5-year period;

- b) timber production summary table for all dispositions (by year);
 - c) class I, II and III road developments showing planning and construction time lines and the status of department license of occupation (DLO) applications;
 - d) all roads noted that are to be monitored, and all outstanding and anticipated reclamation work related to DLO road and stream crossings;
 - e) a brief description of potential issues arising from the proposed harvest activities that have been identified through discussions with Alberta or other known resource users;
 - f) estimated and proposed stored volumes in storage yards or in harvest areas;
 - g) a description of variances (as per 3.3.2) from the SHS and FMP long-term corridor plan supported by appropriate documentation; and
 - h) an as built plan (includes shape files of harvest boundaries and road location, watercourse crossings, road percentages, etc.) from the previous year's harvest (may be submitted under separate cover at an agreed upon time or by September 15). Where differences in harvest boundaries are less than that allowed in 3.5.5 the final boundary will come in through air photo update. Where the difference is greater, the change shall be submitted with the AOP amendment.
2. A map (of appropriate scale) that shows the following:
- a) projected areas to be harvested each year of the next five-year period;
 - b) proposed haul routes (differentiating existing roads from roads to be constructed) and primary routes to be used for reforestation access;
 - c) satellite yard locations;
 - d) the timber dispositions to be operated;
 - e) other important forest resource areas or facilities that could be directly affected by logging; and
 - f) the general location of routes, dispositions and facilities where reclamation work is scheduled and where roads and watercourse crossings are reclaimed.

3.4 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 compartment. The design shall be valid for five years from the time of approval, unless issues deemed significant by Alberta arise during this period.

GROUND RULES

3.4.1 An FHP shall be approved by acceptance if:

- a) validated by a registered forestry professional (RFP);
- b) variances of less than 20% of the area sequenced in the SHS/strata description table (SDT), by compartment per decade;
- c) the harvest area does not exceed 100% of the total area in the SHS or SDT by compartment per decade as tracked in the GDP; and

- d) it adheres to all ground rules as per the FHP checklist (see Appendix 2).

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 annually in the FHP in a format acceptable to Alberta (see section 4.1.1).

- 3.4.2 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.
- 3.4.3 All FHPs submitted by operators who harvest more than 30,000 m³ each year from crown land, must be validated by an RFP. Validation means that, the operating ground rules (OGRs) were followed, the SHS was followed or variances identified, and all affected operators have agreed to the design.
- 3.4.4 Other timber disposition holders affected by the FHP must agree, in writing, with the FHP before it will be approved.
- 3.4.5 Maps shall accurately show the following information:
 - a) the approved forest inventory;
 - b) approved SHS and variances from the SHS;
 - c) all laid out Class I – III roads within the operating unit;
 - d) all laid out harvest area boundaries;
 - e) all proposed Class IV roads within harvest areas;
 - f) current dispositions and reserves (e.g., registered trapline boundaries, permanent sample plot locations (PSP));
 - g) watercourses, their classifications and protective buffers;
 - h) springs, water source and seepage areas;
 - i) road corridors and DLO numbers and classes for both existing and proposed roads. Locations of access control measures;
 - j) planned watercourse crossing locations;
 - k) current information on previously harvested areas, existing trails, seismic lines, power lines, pipelines and access routes;
 - l) if not addressed in 3.4.8 (i) sensitive wildlife sites as per section 7.7.7.2; and
 - m) key ungulate and caribou zones, trumpeter swan lakes, and special access zones as identified by the wildlife referral map.
- 3.4.6 In addition to the FHP map, the following information is required:
 - a) area (ha), and coniferous and deciduous volume for each proposed harvest area;
 - b) summary table of variances from the SHS by compartment (see section 4.1.1);
 - c) reforestation strata designation for each harvest area;
 - d) dispositions;
 - e) description of how the CA is addressed in the FHP;
 - f) list of watercourse crossing locations;
 - g) access control methods employed;
 - h) table showing status of non-DLO roads (see section 11.2.3.2); and
 - i) company specific operating standards for working during non-frozen ground conditions or on areas described in section 9.2.
- 3.4.7 For Class I, II, and III roads, road design and location shall be described for all external roads joining harvest areas to be constructed. Road design and location shall be

described for DLO roads to be constructed for extraction of timber from all proposed harvest areas, if not identified in the phased road planning process or the FMP's long term road development plan by the forest operator. These road comments include the following:

- a) road design, classification, season of use;
- b) choice of corridor location and width;
- c) considerations made for other road users;
- d) considerations made for non-timber resources;
- e) choice of stream crossing location, choice of crossing structure;
- f) integration of existing roads into the design.

3.4.7.1 For class IV with lifespans up to three years from start of construction, road design and location shall be described for external temporary roads joining harvest areas that are to be constructed. The roads schedule in a tabular format includes the following:

- a) road classification and season of use; and
- b) proposed construction dates.

3.4.8 Where applicable the following comments shall be described for each harvest area:

- a) harvest area comments shall be included on the harvest area form that depicts the laid-out harvest area boundary and proposed road;
- b) layout bordering and encompassing riparian management zones when different than the standards in section 6.0;
- c) layout bordering restricted areas (e.g., PSPs, private land) (see 7.2.5 for further requirements regarding PSPs);
- d) identification of understory (see section 7.5);
- e) tactics to address forest health issues;
- f) protection of roadside vegetation - applicable or not, and how to be done;
- g) along permanent roads, strategies to address sight distance concerns with an attempt to maintain sight distance of 400 m or less (see section 7.2 for other requirements);
- h) need for a detailed harvest area plan (DHAP) (see section 3.4.10);
- i) sensitive wildlife sites as defined in section 7.7.7.2 (this information shall be made available for resource planning purposes only through Fish and Wildlife);
- j) historical site considerations.

3.4.8.1 A harvest area block map shall be submitted along with the FHP detailing the laid out harvest area and roads.

3.4.9 DHAPs are required when there is higher than average potential for environmental damage. Circumstances that merit DHAPs are:

- 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;
- g) harvest area-specific structure retention.

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.

3.5 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 and 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

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

- 3.5.1 The AOP submission date is on or before June 15 for summer operations and on or before September 15 for winter operations. Alberta shall respond within 30 days. The AOP shall be appraised by Alberta with approval subject to the outcome of the review.
- 3.5.2 The Operating Schedule and Timber Production, Reforestation Program, Fire Control Plan, and Road Plan, are submitted as in 3.5.1 above, unless otherwise agreed to by Alberta. The schedule for submitting any necessary CA, GDP and FHPs may be different.
- 3.5.3 Only harvest areas and roads with FHP approval shall be scheduled for operations in the AOP submission.
- 3.5.4 The AOP shall contain the following components:

¹ TM118 form

- a) the map(s) referred to in 3.4.5 above including shape files of approved FHP harvest areas;
- 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. where all volumes (deciduous and coniferous) will be charged (quota, deciduous timber allocation, Forest Management Agreement, Commercial Timber Permit (CTP)),
 - V. proposed harvest volume to be harvested by timber disposition,
 - VI. Community Timber Program operators shall include all road use agreements,
 - VII. utilization standards,
 - VIII. list of land use notifications, and date of notification (see section 5.0);
- c) Operating Schedule – a table which outlines:
 - I. list of harvest areas proposed for harvest (including area and volume by species or species group, with totals),
 - II. if not already submitted, a list of roads proposed for construction, maintenance and reclamation for non-DLO roads, except in-harvest area roads. It includes watercourse crossings to be built or installed or removed/maintained,
 - III. if not already submitted, a list of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items,
 - IV. debris disposal;
- d) Annual Reforestation Program (see section 8.2);
- e) Fire Control Plan which covers suppression equipment (see section 7.3 Fire Management, ground rule 7.3.5);
- f) Road Plan (see section 11.2)
- g) GDP and CA if applicable.

3.5.5 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.

3.5.5.1 Changes meeting the following criteria are considered 'Minor Amendments', and require only company RFP validation and notification to Alberta. Minor amendments don't require Alberta's approval, provided all appropriate background checks (e.g., land status automated system (LSAS)) have been made and rationale for the change has been provided (changes can be implemented prior to notification but must be reported no later than seven working days after implementation). Changes shall not adversely affect buffers established for the protection of riparian areas, wildlife sites, historical resources, or aesthetic values:

- a) Additions 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 10 ha, or more than .5 ha for blocks less than or equal to 10 ha. Any additions to block areas must be approved by a company supervisor prior to the change

- being carried out. Any resulting variances from the approved SHS must be categorized and reported as per 4.1.1.
- b) Any deletions to block areas must be approved by a company supervisor prior to the change being carried out and can not exceed the variance tolerance in 3.4.1. Any resulting variances from the approved SHS must be categorized and reported as per 4.1.1.
 - c) Exterior block roads moved to existing access or conventional seismic lines where re-growth is less than 3 m and within 100 m of the approved AOP access. A company supervisor shall approve this move prior to the change being carried out.
 - d) Exterior block roads requiring the development of new Right-of-Way (ROW) clearing (not detailed above) that are moved up to two ROW widths from the approved FHP road location. ROW is considered to be the maximum ROW allowed in Table 3 for the class of road proposed. A company supervisor shall approve this move prior to the change being carried out.
 - e) The interior block roads may be moved as required, provided the total disturbed area does not exceed 5% of the block area and no additional watercourse crossings are required on permanent watercourses.
 - f) Water course crossings structures that have been upgraded from the approved FHP.
 - g) Added crossings on ephemeral or intermittent water courses shall be reported on a weekly basis.
 - h) Change of a scheduled harvest area harvest season and its associated roads (including road standard changes) from non-frozen to frozen.

Any change to the approved AOP not listed in 3.5.5.1 shall be treated as an AOP amendment and requires the approval of Alberta prior to implementation. Alberta will provide the company feedback and/or approval of the AOP amendment within 10 working days of the submission.

3.6 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 such 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. See Directive 2007-01 for further direction on Salvage Planning.

GROUND RULES

- 3.6.1 **Salvage planning is initiated on the natural disturbance when deemed appropriate by Alberta.**
- 3.6.2 **An FHP for the salvage area must be developed, and shall form 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. It is expected that there will be substantial discussion to resolve significant issues with Alberta before the FHP is submitted.**

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 (if applicable);
- improve information for the next FMP (if applicable) (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 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 (if applicable) 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 may be deleted from the net landbase).

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.

Deferred – A stand or portions thereof that are sequenced in the first 10 year period but delayed from harvest until after that period.

Variance - Defined as the sum of deletions and deferrals and is reported as per Little Red River Forestry (LRRF's) SHS manager.

Total SHS Area - Defined as the total SHS area within the FHP.

SHS Area Harvested - The planned and harvested area in the FHP.

Additions - Polygons added to the FHP that are not originally part of the 10 year SHS.

Stratum - The yield stratum used in the FMP TSA.

Compartment - Operational subunits of a forest management unit (FMU) delineated by environmental, operational or watershed characteristics. Variance will be tracked as a cumulative total of all FHPs for each new FHP submitted.

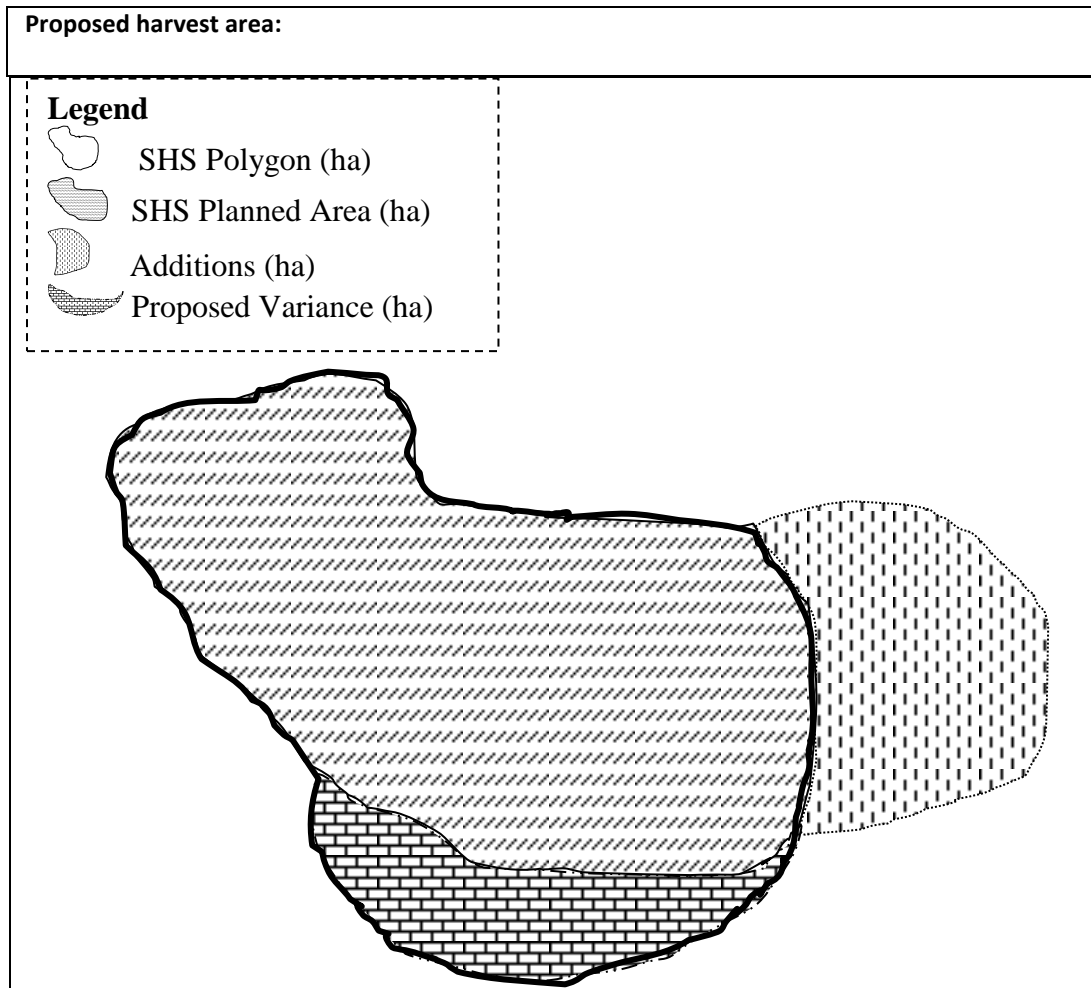
GROUND RULES

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.

4.1.2 Companies shall submit a cumulative SHS variance monitoring report as per LRRF's SHS manager. Variances equal to or greater than .5 ha and all additions shall be reported with each FHP submission by compartment (Variance Table 1). Each report will track additions and cumulative variance for all FHPs in the compartment.

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)	Total FHP Area (ha)
Stratum 1						
Stratum 2						
Stratum 3						
Stratum 4						
Sub-Total						
Total (%)						



- 4.1.3 Alberta will appraise any plan exceeding the thresholds set out in 3.4.1 to determine the need for a CA per section 3.2.
- 4.1.4 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 The GDP will contain the cumulative variance and planned and harvested SHS area for all compartments (Variance Table 2).

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)
				(ha)	(%)			
FHP 1								
FHP 2								
FHP 3								
FHP 4								
Sub-Total								
Total (%)								

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 The tree/piece utilization standards are stated in the applicable timber disposition and shall normally be one of the following standards:

Coniferous Utilization Standards

15/11 Utilization

- Merchantable Tree: one that has a minimum diameter of 15 cm outside bark at stump height (30 cm) and a usable length of 4.88 m to a 11 cm top diameter (inside bark).
- Merchantable Piece: one that is 2.44 m (plus 5 cm trim allowance) or longer, with an 11 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 cm outside bark and a merchantable length of 4.88 m or greater to a 10 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 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 cm outside bark at stump height (30 cm) and a merchantable length of 5.0 m or greater to a 13 cm top diameter (inside bark).
- Merchantable Piece: one that is 2.44 m (plus 5 cm trim allowance) or longer, to a 13 cm (inside bark) small end, where rot content or form does not render it unusable.

4.2.2 Coniferous and deciduous log butts or large ends exhibiting advanced decay greater than 50% in area of the cut surface (basal area) may be bucked at 0.61 m intervals or less to 50% sound wood.

- 4.2.3** Maximum stump height when measured from ground level shall be no more than 30 cm or that used in the timber supply analysis for the FMP (e.g., 15 cm). Exceptions may be approved in the FHP (e.g., to delineate harvest areas, create rub posts for understory protection). Where stumps are left to delineate areas (e.g., harvest areas, create rub posts for understory protection, or to delineate poorly defined watercourses) they shall be no less than 20 m apart and no higher than 2 m.
- 4.2.4** As per the Debris Management and Structure Retention ground rules, forest operators are permitted to leave merchantable volume in harvest areas if the approved FMP identifies specific stand structure retention strategies. In the absence of FMP guidance, the standards in section 7.4 apply.
- 4.2.5** All trees/pieces used in the construction of crossing structures may be scattered or piled along the ROW or in the harvest area, but they shall not be piled in riparian areas.
- 4.2.6** Company processing practices cannot make an unmerchantable piece from a merchantable tree or merchantable piece.

5.0 INTEGRATION WITH OTHER USERS

5.1 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 (if applicable) shall have addressed recreational issues through a variety of tactics such as deferrals or buffers around specific sites or access management strategies.

GROUND RULES

- 5.1.1 Operational tactics to mitigate impacts on recreation and tourism shall be described in the GDP and FHP.**
- 5.1.2 The forest operator shall work with groups that have raised concerns with the operator or have been identified by Alberta.**
- 5.1.3 Roads shall be designed to ensure they can be used safely while minimizing their impact on the recreation values of the area.**
- 5.1.4 FHPs affecting recreational sites shall provide opportunities for the enhancement of existing recreational trail and road systems whenever possible.**

5.2 TRAPPING

PURPOSE

To avoid damage to the infrastructure associated with registered fur management areas (RFMA) and to reduce the impact on trapping opportunities.

DISCUSSION

Communication with the senior partner and/or operator of a trapline is a key element in minimizing the impact of timber operations. 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. Upon request, the local Fish and Wildlife office shall provide the relevant list of trappers to the forest operators before January 1 of each year.

GROUND RULES

- 5.2.1 A representative of the forest operator shall personally contact, or send a registered letter to the senior partners of an RFMA during the preparation of the FHP. Information such as cabin locations, trails and other improvements, or concerns shall be noted at this stage. During the development of the FHP information and concerns**

shall be integrated into the plan. The forest operator shall provide the trapper with a copy of the approved FHP map.

- 5.2.2 At least ten days prior to commencing operations, the forest operator shall notify the trapper, preferably by personal contact of timber operations that are beginning in the RFMA.

5.3 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.

At the GDP, FHP and AOP stages of planning, 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.

Section 5.3 will only apply if and when grazing dispositions are issued within FMU F23.

GROUND RULES

- 5.3.1 The forest operator shall conduct all operations in accordance to the Grazing Timber Integration Manual as well as Directive SD 2011-03.
- 5.3.2 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.
- 5.3.3 The forest operator has contacted the grazing disposition holder in person or by phone a minimum of ten days prior to commencing timber operations to discuss access and any other issues affecting the range management of the grazing disposition.

5.4 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 in the FMP.

Areas considered highly sensitive are those:

- a) within, adjacent to, or viewed from recreational sites and tourist developments;**
- b) seen from elevated 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 RULES

- 5.4.1 Highly sensitive areas shall be assessed and tactics shall be employed in the FHP to mitigate the impacts of harvesting and reforestation on visual quality.**

5.5 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 Alberta, forest operators shall develop and implement a process for identifying and protecting resources that are regulated by the Historical Resources Act.

GROUND RULES

- 5.5.1 **All known historical resources, and lands on which they are likely to occur shall be identified and managed in keeping with the requirements of Alberta.**
- 5.5.2 **Historical resource records are confidential and shall not be shared with the public.**
- 5.5.3 **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 Culture 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.

DISCUSSION

The FMP typically addresses watershed water quantity and flow issues. In lieu of an approved FMP, these 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. 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.

Authorizations by Alberta do not imply authorization under federal legislation and requirements, notably the federal Fisheries Act. The proponent must seek 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. In the event the channel classification is not distinctly evident, the width shall be determined by the average of four measurements taken at regular intervals at representative points of undisturbed stream channel over the length of the watercourse bordering the block.

- A minimum of four measurements are required with the measurement location flagged for audit purposes.
- The channel width is measured from where the bank begins to slope down towards the channel bottom across to the same point on the opposite bank.
- Where the distance bordering the block is not enough for four measurements, reduce the measurement interval as required.

6.0.2 Where an approved FMP or watershed analysis does not provide an estimate of increased water yield, the following applies:

- watersheds shall not be unduly affected by large harvest areas or harvesting large amounts of timber in a watershed unless otherwise approved in the FMP;
- predicted average annual water yield increases should not exceed 15% within third-order streams;

- companies will report the increase in water yield annually in a mutually agreeable format.
- 6.0.3** Measures must be implemented, including temporary and permanent erosion control measures, 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. Where uncertainty exists on the classification of the watercourse, the watercourse protection area shall be that required by the higher class of watercourse.
- 6.0.5** All 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 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.
- 6.0.7** Sediment, logging debris, 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, reclamation, or silviculture operations.
- 6.0.8** Equipment shall cross watercourses only at approved crossings.
- 6.0.9** Logs shall not be decked in watercourses, riparian areas, or seepage areas.
- 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 avoid stream sedimentation.
- 6.0.11** Beaver ponds shall have same classification as the watercourse flowing out of the pond, as measured at a representative location within 50 m of the dam. Beaver ponds with no outflow channel require a 20 m vegetated buffer from the high water mark, unless otherwise approved by Alberta.
- 6.0.12** Harvesting is not permitted within water source areas during non-frozen periods.

Table 1. Watercourse Classification

Watercourse Classification					Fisheries/Wildlife Values	Potential Impacts
Type	Mapping Designation	Physical Description	Portion of Year Water Flows	Channel Development		
Class "A" Waterbodies	Solid red line on Watercourse Crossing Codes of Practice (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, deposition of sediment, chemical contamination or alteration of stream flow
Class "B" Waterbodies	Solid (variable colour) lines overlain by small circles on Watercourse Crossing Codes of Practice (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, deposition 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 5 m	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 greater than 0.5 m to 5 m	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 0.5 m; 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 contributing 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. 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.	No disturbance or removal of timber within 100 m of the high water mark; No duff disturbance of intermittent (min 10 m vegetated buffer) or ephemeral drainages (minimum 5 m 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. Any existing roads may be maintained at present classification standards. Any watercourse crossings within 500 m upstream must be specifically approved in the AOP.	No disturbance or removal of timber within the appropriate riparian area specified by stream type unless specifically approved in the AOP; No duff disturbance of intermittent (minimum 10 m 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 60m 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.	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.	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.

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
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	Construction not permitted unless approved in the AOP; 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 within 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 100 m of oxbow lake unless specifically approved in the FHP.	The buffer shall encompass the area from the high water mark of the main watercourse to 20 m beyond the high water mark of the oxbow lake. Oxbow lakes outside the buffer of the main watercourse shall be treated as water source areas.	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 approved SHS 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. The use of Alberta vegetation inventory (AVI) polygon boundaries will help to plan this variability. Use of natural features as harvest area boundaries is consistent with natural disturbance and shall be used whenever possible.

Landscape planning requires that targets be set that are measurable. 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. Creating variability in natural landscapes is important because element amounts vary between landscapes, and 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.

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 SHS or structure retention strategy, the following ground rules shall apply:

7.1.1 Adjacent watersheds of small permanent watercourses shall have wildlife corridors connecting their uplands. This corridor should be focused on natural travel corridors and may contribute towards structure retention targets.

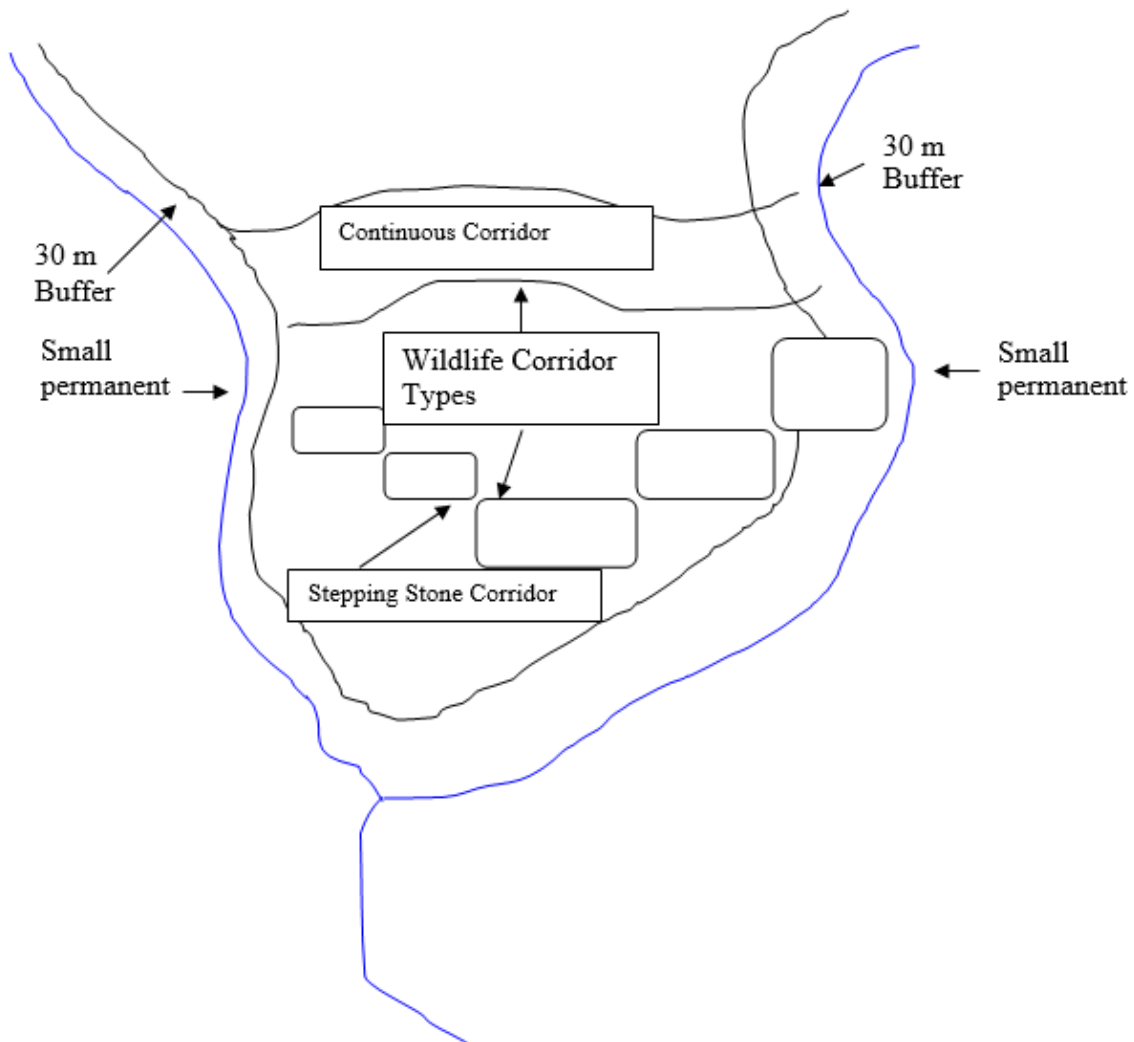


Figure 1. Wildlife Corridor Types

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.

The following items affect harvest area size and shape:

- current inventory polygon boundaries;
- tree species, age and silvicultural characteristics;
- habitat requirements of species of management concern and species at risk;
- key wildlife zones;
- amount and distribution of non-productive lands and immature treed lands;
- location and size of watercourses and buffers;
- location of roads, pipelines and power lines;
- topographic features;
- presence of viable understory;
- retention of shrub and tree patches;
- accessibility to all or part of the compartment;
- potential blowdown of peripheral and within-harvest area trees;
- insects and diseases;
- visual sensitivity.

GROUND RULES

- 7.2.1 Line of sight shall be minimized where harvest areas are adjacent to accessible permanent Class I, II or III roads. Targets for the limits of sight distance shall be 400 m, but may be exceeded if well justified in FHP.**
- 7.2.2 Roadside vegetation shall be protected in harvest areas to limit the line-of-sight distance across the harvest area unless otherwise approved in the FHP. To minimize breaks in the vegetation screen, only one road entry point shall be commonly allowed into the harvest area unless otherwise approved in the FHP.**
- 7.2.3 Where possible direct distance to wildlife hiding cover should not exceed 200 m.**
- 7.2.4 Practices required by other disposition holders shall be implemented (e.g., pipeline crossings, road use agreements, operating constraints around power lines).**
- 7.2.5 Alberta PSPs shall not be disturbed or harvested unless such action is approved by Alberta. These plots shall also be protected from blowdown.**

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;
- to minimize the risk of wildfires, 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 (if applicable) 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 operators shall follow the guidelines in the FireSmart Protecting Your Community from Wildfire manual.

Acceptable methods of reducing slash hazards are defined in Directive AF-FDP-2017-07, Debris Management Standards for Timber Harvest Operations.

GROUND RULES

- 7.3.1** Slash accumulations resulting from timber harvesting, road, and campsite construction shall be disposed of within 12 months after harvesting operations are complete in a manner acceptable to Alberta as per Directive AF-FDP-2017-07.
- 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. Unacceptable accumulations include piles of trees or non-merchantable timber, and tops or branches deposited during logging that could create fuel ladders for fire bordering the stand.
- 7.3.3** Burning operations shall :
- a) not be conducted during the fire season, unless otherwise approved through a Burning Permit;
 - b) not commence until notification to the Forest Area has occurred; and
 - c) require a post burning survey to ensure piles are extinguished.
- 7.3.4** The FHP shall comply with direction provided in Community Firesmart Plans.

7.3.5 The fire control plan shall be submitted on or before March 1 as part of the AOP and shall contain the following:

- 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.

These ground rules describe the average number of patches per hectare of residual material that will be left within harvested areas of a landscape unit for those where this is not defined in a FMP. There may be zero patches of residual structure in any particular harvest area as long as the amount identified in the TSA is met across the landscape over time.

Current information suggests that ecological benefits are directly proportional to the amount of structure retention; ecological benefits increase with greater levels of structure retention. 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.

The amount and composition of merchantable and residual structure will incorporate other values and objectives (e.g., forest health, visual aesthetics) and will vary across the landscape.

GROUND RULES

7.4.1 Residual structure shall be retained in harvest areas during harvest and silviculture operations (including salvage operations) according to the FMP regarding the amount of structure, size of patches, species, composition, and distribution. In the absence of direction in the FMP, the following standards apply.

7.4.2 Volume targets for structure retention will vary by harvest area. A target of 2% merchantable coniferous volume and 2% merchantable deciduous volume will be retained within harvest areas across the overall landscape of FMU F23.

7.4.2.1 Any patches identified as retention shall not be harvested until the next rotation.

7.4.2.2 Retention shall be within the harvest block boundary, except where approved by Alberta.

7.4.2.3 Retention contributing to the target in 7.4.2 can only be from the net landbase (e.g. retention from buffers on watercourses or steep slopes do not contribute).

7.4.3 The following table is the average number of patches of residual structure that shall be left within harvest areas. There may be zero patches of residual structure in any particular harvest area as long as there is compensation in other harvest areas to meet the FMU average. These guidelines are based on maintaining 2% of the volume within harvest areas for SHS Period 1 (2004-2009) across the FMU. The required average number of patches per harvest area is based on the average block size, distribution of blocks in the harvest area size classes and maintaining the residual structure over the landscape FMU F23.

Table of area residual structure

Harvest Area Size	Patch Type / Size	Average Number of Patches / Harvest Area
2 - 20 ha	Small < 0.2 ha	Small = 0.8
	Large 0.2 - 2.0 ha	Large = 0.0
20 - 60 ha	Small < 0.2 ha	Small = 2.2
	Large 0.2 - 2.0 ha	Large = 0.4
60 - 100 ha	Small < 0.2 ha	Small = 3.7
	Large 0.2 - 2.0 ha	Large = 1.1
> 100 ha	Small < 0.2 ha	Small = 8.1
	Large 0.2 - 2.0 ha	Large = 2.0

7.4.4 Forest operators shall retain structure in the following manner:

- a) leave larger patches rather than multiple smaller patches;
- b) leave individual stems of residual structure throughout harvested areas, as available;
- c) leave as many individual stems of non-merchantable trees, shrubs and snags as operationally and silviculturally feasible:
 - I. leaning snags or trees of non-merchantable species that are greater than 6 m in height that create a safety hazard may be felled to create safe working conditions,
 - II. snags within 40 m of roads, camps, landings, fence lines, power lines and machine maintenance areas may be felled to create safe working conditions.

7.4.5 The following are guidelines for the spatial distribution of residual structure:

- a) retain residual structure near woody debris piles (and vice versa);
- b) retain residual structure near the harvest area boundary to create a gradual ecotone between the harvest area and un-harvested forest;
- c) retain residual structure in patterns and locations that minimize the potential for blowdown;
- d) retain residual structure near ephemeral draws and intermittent streams;
- e) retain residual structure within inoperable areas whenever possible;
- f) retain merchantable retention along intermittent draws within the machine free zones.

7.4.6 As per 4.2.3, forest operators may create stubs anywhere within the harvested area to supplement snag densities, aid in wind-firmness of residual patches or for use as rub posts.

7.4.7 The following are guidelines for the retention of residual structure:

- a) Retained structure contributing to the target merchantable volumes, can include merchantable volume within understory avoidance patches, pure

merchantable areas, single merchantable stems and areas within salvaged burns.

- b) Residual material, where it exists on the landscape, may also be retained and can include non-merchantable areas, non- merchantable volume within understory avoidance patches, lesser vegetation, standing dead, broken, decaying trees, trees identified as having dens or nests, viable understory, or other unique flora and/or terrain features.
- c) When establishing priority areas for patch retention and/or merchantable retention within a compartment, planners will consider 7.4.4 and the following:
 - proximity to existing water buffers;
 - wildlife zones and wildlife habitat objectives;
 - harvest area size (emphasis in harvest areas which exceed 100 ha in size);
 - line of sight and distance to hiding cover objectives;
 - within areas where multiple canopy layers and a range of tree sizes and species exists; and
 - in planning the distribution of the patches of residual structure left within harvest areas, the guidelines in 7.4.5 will be used.

7.4.8 The company shall annually report on structure retention results by FMU in the GDP or annual report.

7.4.9 Merchantable volumes that are permanently retained to create stand structure shall be measured and treated as production in cut control management.

7.4.10 Merchantable volumes retained for structure retention purposes shall be reconciled every 5 years at the end of each cut control period.

7.4.11 LRRF shall measure and monitor their structure retention in a manner acceptable to Alberta.

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. Consideration for protecting understory must be given to all stand types containing white spruce understory, and balsam fir where approved by Alberta. Techniques will vary depending on whether the stand is defined as coniferous or deciduous.

Two understory protection techniques are considered:

- **Avoidance** – Used in the deciduous landbase, in white spruce overstorey with a white spruce understory, and low density stands and/or highly aggregated (clumped) understory distribution. Wind buffering tactics and pre-planning not specifically required.
- **Protection** – Used in the coniferous landbase (deciduous overstorey with a conifer understory identified as coniferous in the TSA). Wind buffering tactics utilizing structure retention, pre-planned strip harvest/skid trails

In both understory protection techniques, 50% of the acceptable trees in the understory must be retained without harvest damage.

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

1. **Landbase Assignment From Approved FMP (or SHS): 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.

The SHS shall specify stands with understory sequenced for harvest.

GROUND RULES

- 7.5.1 **The FHP shall specify harvest areas for understory protection vs. avoidance techniques. Detail on protection techniques shall be described in the FHP harvest area comments and DHAPs.**
- 7.5.2 **Understory discovered in the field, but not previously identified shall be protected as per 7.5.4.**
- 7.5.3 **Stands shall be assigned to the deciduous or coniferous landbase in the FMP based on the approved vegetation inventory.**
- 7.5.4 **Understory protection shall be practiced in the coniferous landbases. Understory avoidance shall be practiced in the deciduous landbase. Blocks with avoidance**

techniques and low density evenly spaced understory may achieve less than 50% protection. These blocks must be identified in the FHP before approval will be given.

- 7.5.5 Protection techniques involve comprehensive pre-planned strip harvest pattern, controlled random skidding (for clumped understory distribution), and wind buffering tactics such as aspen retention. Avoidance techniques are used for stands with low density and/or highly aggregated (clumped) understory distribution. Wind buffering not specifically pre-planned.**

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 must seek 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 are 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 and Wildlife Management Information System (FWMIS), 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 woodland caribou, grizzly bear, trumpeter swan and others as determined by Alberta from time to time;
- maintain the effective habitats for ungulates in river valley environments.

GROUND RULES

- 7.7.1 Access management within Woodland Caribou, Grizzly Bear, and Key Wildlife and Biodiversity Zones:**
- 7.7.1.1 To the extent possible, all new access roads must follow existing disturbances, unless doing so will compromise options for subsequent access management (i.e., “traditional access” issues).**
- 7.7.1.2 Preference shall be given to development and use of winter (frozen ground) roads since this reduces negative impacts on wildlife, permits minimization of long-term infrastructure, and facilitates reclamation.**
- 7.7.1.3 It is recognized that in some cases work will occur throughout the winter season to take advantage of frozen ground access. Frozen ground operations using frozen ground roads take precedent over early-in/early-out. Completing operations in ungulate habitat areas early in the winter season remains a management objective.**
- 7.7.1.4 As an alternative to winter (frozen ground) roads, summer roads may be developed and used, subject to the following:**

- a) Road width and grade shall be minimized. Preferentially, summer roads shall be temporary “dry weather” routes, with use suspended when ground conditions are unfavourable.
- b) Summer harvesting areas shall preferentially be located outside of caribou and grizzly range as well as outside of ungulate habitat in river valleys, or as an alternative, in proximity to previously existing all-weather access roads to assist in reducing the need for new summer access routes. As an alternative, summer harvesting in more remote areas shall have hauling deferred to take advantage of frozen ground conditions.

7.7.1.5 Except where identified and agreed upon within the FHP, only temporary access roads shall be used.

7.7.1.6 Roads shall be built no sooner than one year prior to harvesting operations. Temporary roads shall be re-contoured and reclaimed (and potentially reforested) within 18 months of completion of harvesting and hauling operations, unless otherwise agreed to in the operating schedule.

7.7.1.7 As agreed to between the company and Alberta, effective forms of public access control for highway vehicles shall be maintained. Control of highway vehicle use of any open temporary or permanent access route may be required. Where identified by Alberta, options for access management must be considered during the CA or FHP. The need for options to manage off highway vehicle traffic must be considered in the CA or FHP. See section 11.5 for more detail on Access Management.

7.7.1.8 Reclamation techniques used on access routes must strive to prevent highway vehicle use and limit off-highway vehicle use.

Woodland Caribou

DISCUSSION

The FMP strategies (if applicable) and SHS shall describe the 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.

Woodland caribou are protected as a “Threatened” species under Alberta’s Wildlife Act and the Federal Species at Risk Act. “A Woodland Caribou Policy for Alberta” provides Government of Alberta intent and direction for recovery of woodland caribou populations and habitat, including managing industrial work on caribou range. Both national and provincial woodland caribou recovery processes have been initiated which may have implications for timber harvesting and access development in Alberta. The following ground rules apply to Woodland caribou range as delineated by Alberta.

Timber operations and management in caribou range can affect caribou populations and habitat directly or indirectly and in four main ways: 1) creating and maintaining public access routes, 2) altering natural and human-caused mortality rates on caribou populations (both through access route development and habitat changes), 3) altering the amount, quality, and effectiveness of caribou habitat, and 4) displacing and causing undue sensory disturbance to individual caribou.

All of the four factors are consequential for caribou conservation; however, predation rates and habitat changes are of primary concern.

The negative effects of creating and maintaining access routes (public travel, predation, reduced habitat effectiveness, disturbance and displacement) shall be managed by planning the amount, tenure and class of new access routes (roads), and by reviewing and acting upon management options (i.e., access management, abandonment, reclamation) for existing routes.

GROUND RULES

7.7.2 Woodland Caribou

7.7.2.1 If not addressed in the approved FMP (if applicable) and SHS strategies, a CA must be completed that addresses the following issues:

- a) provide an agreed upon habitat supply forecast including the amount, type, and spatial arrangement of caribou habitat;
- b) the location of all proposed harvest areas;
- c) options for partial harvest systems;
- d) the amount, alignment, standard (road type) and longevity (tenure) of all access roads;
- e) use of, and improvements to existing access roads;
- f) access road reclamation plan and schedule, which shall also consider options for reforestation of roads. This shall take into account reclamation options for existing (traditional) access routes;
- g) measures to achieve public and industrial access management;
- h) operating schedule (road construction, harvesting, silviculture);
- i) protection of key caribou habitat features (as identified by Alberta and company);
- j) terrestrial lichen management strategies (in relation to both harvesting system and silviculture prescription);
- k) proposed summer operations.

7.7.2.2 Silviculture prescriptions shall strive to limit non-coniferous shrub and tree regeneration in habitats dominated by coniferous species prior to harvest, and where regeneration to coniferous-dominant stands is planned. The above only applies to pure coniferous stands. Silviculture prescriptions shall strive to protect existing terrestrial lichens, and facilitate terrestrial lichen regeneration (see section 8.0 for silviculture prescription requirements).

7.7.2.3 A sufficient amount of habitat (considering both habitat quality and effectiveness) must be maintained at all times within the caribou ranges. The FMP or SHS shall provide direction of the amount, configuration and location/adjacency of harvest areas and older seral stage retention areas, and on rate of harvest.

7.7.2.4 Harvesting operations shall be “concentrated” spatially within caribou range. Provided green-up requirements are met (unless otherwise approved by Alberta), reserve harvest area harvesting within previously existing two or three-pass harvest designs within caribou range shall occur prior to new harvest areas being opened up.

- 7.7.2.5 In reserve harvest areas, special consideration must occur during the CA if green-up requirements have not been met or if the resulting post-harvest opening size will exceed 1000 ha. Special planning and operational tactics shall be defined to address potential watershed and reforestation concerns. This could include providing supporting documentation and applying innovative techniques to promote snow catch and reduce impacts of wind exposure.
- 7.7.2.6 Retention patches shall be used in large harvest areas to protect areas of concentrated terrestrial lichen growth, and reduce, watershed, aesthetic, and wildlife related concerns.
- 7.7.2.7 Areas of concentrated terrestrial lichen growth (where terrestrial lichens are the predominant ground cover) within proposed harvest areas must be delineated in the FHP. DHAPs which identify protection measures must be provided to the operator for these areas. Structure retention in harvest areas within the caribou range should focus on these lichen areas. Alberta may request a review of these plans at any time.
- 7.7.2.8 Winter operations are preferred to protect existing terrestrial lichen growth within harvest areas, and to retain lichen propagules.
- 7.7.2.9 Harvest area boundaries shall be based upon natural stand edges, breaks in topography, and other natural features.
- 7.7.2.10 While maintaining safety, class roads within caribou zones shall have narrower and more temporary road surfaces than those built to road standards outlined in Table 3. Table 3A provides guidance towards achieving these objectives. The goal is for development of frozen ground access to minimize grade development.
- 7.7.2.11 Summer harvesting areas shall preferentially be located outside of caribou range or if within caribou range, be located in proximity to previously existing all-weather access roads to assist in reducing the need for new summer access routes. As an alternative, summer harvesting in more remote areas shall have hauling deferred to take advantage of frozen ground conditions.

Trumpeter Swan

DISCUSSION

The FHP shall describe 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.

Trumpeter swans are classified as a “Species of Special Concern” species under the Alberta Wildlife Act. The [“Recommended Land Use Guidelines for Trumpeter Swan Habitat in Alberta”](#) provides background, intent, and specific direction for managing industrial work near trumpeter

swan breeding wetlands. Locations of breeding wetlands are found on provincial land use referral maps.

Trumpeter swans are sensitive to human disturbance, and human activity in breeding areas may decrease survival of eggs or cygnets. Trumpeter swans that are disturbed may not nest or may abandon an existing nest. Therefore, the breeding population continues to be dependent on current management practices and habitat protection.

Timber harvest planning and operating ground rules must reflect the sensitive nature of this species. These operating rules serve three primary purposes:

- a) protection of the long-term integrity and productivity of trumpeter swan breeding habitat;
- b) avoidance of industrial disturbance to trumpeter swans during nesting and rearing of cygnets; and
- c) minimize the access created near swan lakes to reduce the potential for secondary disturbance of trumpeter swans from recreational use.

During the breeding season (April 1 to September 30), low-level (<2000') aircraft flights may disturb trumpeter swans. Low-level aircraft flights are discouraged over identified trumpeter swan lakes or water bodies. Currently, Moose Lake is the only identified trumpeter swan lake in FMU F23.

GROUND RULES

7.7.4 Trumpeter Swan

7.7.4.1 From April 1 to September 30, there shall be no harvesting, hauling, road building or scarification activity within 800 m from the high water mark to the identified trumpeter swan lakes or water bodies.

7.7.4.2 There shall be no timber harvesting within 200 m from the high water mark of identified trumpeter swan lakes or water bodies.

7.7.4.3 An area up to 500 m from the high water mark of identified trumpeter swan water bodies shall be managed in a manner that provides additional protection for the swans. Special measures shall be determined on a site-specific basis during the FHP. Special measures within this zone shall include site preparation that reduces the potential for future vehicular access, no general application of herbicides, and attempts to limit maximum line of sight to 100 m. Attempts to retain sufficient structure to contribute to a forested habitat in this zone are encouraged. Techniques that limit line of sight and contribute to the treed buffer of the wetland are encouraged.

7.7.4.4 There shall be no development of long-term infrastructure (roads and camps) within 500 m from the high water mark of identified trumpeter swan water bodies. Only seasonal winter routes shall be permitted within the 500 m buffer.

Key Wildlife and Biodiversity Zone

DISCUSSION

For deer, elk and moose in Alberta, key winter range is often found, in river valleys. These landforms contain the topographic variation and site productivity conditions that provide winter foraging conditions in proximity to forest and topographic cover. Also, south-facing valley slopes have relatively lower snow accumulations and warmer bedding sites. The valley landform itself provides protection from high wind chills. Traditional, high use and high quality winter ranges have been identified and mapped (provincial land use referral maps) on the basis of several decades of winter aerial population surveys, supplemented by habitat assessments using aerial photo interpretation and ground surveys.

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.

The FMP (if applicable) and SHS shall provide direction on the location/adjacency of harvest areas and retention areas, and on rate of harvest. Habitat effectiveness, including maintenance of thermal cover, foraging areas and escape cover is important for ungulates. Timber operations within and adjacent to key wintering areas adds stress and increases energy drain for animals. They may be forced to move about unnecessarily and even relocate to less favorable habitat. This becomes an increasingly significant factor as winter progresses. Activities associated with timber harvest may also create temporary and permanent access that exposes animals to additional non-industrial disturbances, increased levels of harvest from licensed and non-licensed hunting, and to increased predator efficiency.

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 their key winter ranges. 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 winter ranges during the mid-to late-winter period.

Ground Rules

7.7.5 Key Wildlife and Biodiversity Zone

7.7.5.1 The FMP (if applicable) and SHS shall provide direction on the location/adjacency of harvest areas and retention areas, and on rate of harvest.

7.7.5.2 The amount, tenure and class of new access roads shall be minimized and consistent with the land use objectives in regionally defined key wildlife zones (regional LFD land use referral maps). Access development will strive to minimize new human infrastructure.

- 7.7.5.3 The alignment and standard of new long-term and permanent access roads (class I - III) must be identified and agreed upon within the long-term access plan. New long-term and permanent access roads shall not be developed below the valley breaks of rivers, except in isolated cases for river crossings.**
- 7.7.5.4 Any proposed new crossings of rivers and creeks on class I - III roads must be identified and agreed upon within the access management plan; new permanent crossings shall be avoided.**
- 7.7.5.5 Where possible all access roads shall avoid known key habitat features.**
- 7.7.5.6 Where the requirement for access control has been identified by Alberta, the strategies and location for access control shall be discussed in the FHP. Potential opportunities for partial or complete route closure and/or reclamation following planned harvesting and silviculture shall be discussed.**
- 7.7.5.7 Unless otherwise agreed to in the AOP, timber operations should be conducted outside of the period January 15 to April 30.**
- 7.7.5.8 Unless approved by Alberta, broadcast application of herbicide shall not occur within this zone. Where herbicide use is approved, known willow areas shall be avoided.**
- 7.7.5.9 Mechanical thinning and use of herbicide as approved by Alberta may occur within this zone.**
- 7.7.5.10 Stand tending activities shall only remove competing vegetative growth that interferes with free-to-grow standards in order to maintain browse availability.**

Arctic Grayling and Bull Trout

DISCUSSION

The FHP shall describe 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.

Arctic Grayling are classified as a “Species of Special Concern” under the Alberta Wildlife Act. One of the greatest contributing factors threatening this species related to the forest industry is the density of linear features (e.g., Class I-IV roads, skid trails, and all pre-existing access). Development of the FHP must focus on ensuring that best management practices related to construction, maintenance and reclamation of roads is in place, with the primary intent being the protection of fish habitat and productivity. This is achieved through the maintenance of natural hydrologic processes, avoiding erosion, and increasing protection of streams where risks to both species are identified.

Timber harvest planning and operating ground rules must reflect the sensitive nature of this species. These operating rules serve three primary purposes:

- a) protection of the long-term integrity, connectivity, productivity and access of arctic grayling to the spawning, rearing, feeding and over wintering habitat within the watershed;
- b) protection of water quality and quantity metrics that provide a key component of the habitat that supports native fish species within watersheds (e.g. temperature, dissolved oxygen content, natural sediment, avoidance of anthropogenic sedimentation and productivity) to ensure the continued occupancy and use of historical watersheds by this species; and
- c) minimize the industrial footprint and density of linear features intersecting watercourses within arctic grayling and watersheds to reduce the potential for secondary disturbance and mortality from recreational use.

GROUND RULES

7.7.6 Arctic Grayling

Locations of existing arctic grayling can be identified using the Fisheries and Wildlife Management Information System (FWMIS), and the associated Fish and Wildlife Internet Mapping Tool (FWMIT). Within or adjacent to known locations:

- 7.7.6.1 Operational planning by the company should incorporate the use of Alberta's Wet Areas Mapping tool to identify areas that are sensitive to disturbance. Field confirmation of these sites including depth to water, potential disruption of groundwater flows, and areas at high risk of erosion in wet or riparian areas can be a useful tool in determining road and crossing location.
- 7.7.6.2 Detailed harvest area plans (DHAP) for operations shall be submitted (as per 3.4.9).
- 7.7.6.3 Unless otherwise approved, all operations should occur outside the restricted activity period (RAP) of April 16 to July 15. Early winter operations are preferred; and during dry or frozen conditions are best.
- 7.7.6.4 Site preparation activities within 100 meters of watercourses must prevent input of sedimentation.

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.

7.7.7 Other Species

- 7.7.7.1 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. Ideally, the buffer will offer connectivity through the block to the adjacent forest and provide security to the species using the buffer. 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.

7.7.7.2 In the event that site-specific buffers or other management techniques are not agreed to in the FMP (if applicable) and FHP, the following buffer widths shall apply:

During review of the GDP, the Fish and Wildlife biologist will provide direction as to which of the following items may be important to address in the FHP.

Table of sensitive site buffers

Sensitive Site	Width of Forested Buffer
Breeding Sites and Hibernacula of Species At Risk (e.g., Salamanders, Amphibians and Reptiles)	100 m
Bat Hibernacula	100 m
Sadhill Crane Nesting Area	100 m
Wolverine Den	100 m
Mineral Licks	100 m
Raptor Nest Tree	100 m
Natural Springs and Beaver Ponds with no outflow channel	20 m - vegetated

Retention strategies less than those prescribed above shall be discussed with Fish and Wildlife prior to approval.

8.0 SILVICULTURE

PURPOSE

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

DISCUSSION

A reforestation program is required by Alberta under Timber Management Regulation (TMR) 143.1. The reforestation program is a component of the AOP 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 (if applicable) 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.

8.1 PLANNING

GROUND RULES

- 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).**
- 8.1.2 The conditions outlined by Alberta must be met prior to planning reforestation of balsam fir or alpine fir as an acceptable species (see Directive 2001-01 or successors).**
- 8.1.3 Harvest layouts bordering previously harvested areas shall avoid damaging regeneration.**
- 8.1.4 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.**
- 8.1.5 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).**
- 8.1.6 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 testing for improved stock.**

8.2 REFORESTATION PROGRAM

GROUND RULES

8.2.1 The reforestation program shall be submitted:

- a) before April 1 for silviculture operations commencing between May 1 and October 31; or
- b) before September 15 for silviculture operations commencing between November 1 and April 30.

8.2.2 Harvest areas (openings) shall be clearly identified (e.g., maps, spatial files, or delineation on the ground through visual markings).

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

- a) silviculture prescription;
- b) proposed silviculture treatment schedule;
- c) maps as requested by Alberta;
- d) summaries of stratum changes, stratum changes , final stratum, QAC adjustments; and
- e) proposed blocks for declaration in lieu of survey and re-treatment.

a) Silviculture Prescription

The FMP (if applicable) contains a silviculture strategy table for prescriptions specific to different forest stratum. Changes to the approved strategy in the FMP are outlined in the AOP.

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.

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 harvest areas and the estimated area (ha) to be treated;
- the reforestation strata standard for each harvest area (see below for more detail);
- season or date of activity – summer vs. winter;
- a silviculture access plan which includes location of access, method of access and location and type of crossing structures;
- the following proposed reforestation activities for each harvest area (or stand) shall be listed:
 - I. Site Preparation – mechanical or chemical treatment
 - II. Planting – primary species, density range, and notification if outside approved seed zone
 - III. Seeding – species and notification if outside approved seed zone

- IV. Leave for Natural – species
- V. Manual Tending – type (cleaning vs. spacing or combination)
- VI. Fertilization – type of fertilizer
- VII. Herbicide/Insecticide application – type of chemical and method (ground vs. aerial) and target species for insecticide
- VIII. Commercial Thinning
- IX. Regeneration surveys – establishment and performance
- X. Cone/cuttings collection – (if unknown, Alberta shall be notified regarding collections as per the ‘Standards for Tree Improvement in Alberta’)
- XI. Let it grow as a retreatment strategy.

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

- o changing to a treatment of a harvest area or part of a harvest area not approved in the silviculture strategy table for the specific strata;
- o additional harvest areas to be treated by any means of treatment; and
- o the remaining changes require notification to Alberta through ARIS reporting.

If a harvest area is declared sensitive, the forest operator shall provide additional information beyond the strategic and tactical levels (see section 3.4.10). This information shall include the actual techniques (e.g., type of site preparation machine) and their expected impact on the harvest area attribute(s) that make it a sensitive site (e.g., providing frequent furrow trenching breaks on down hill run to reduce erosion).

Note that proposals to deploy seed or vegetative material outside the seed zone or breeding region require prior approval of the Provincial Seed Officer at the Alberta Tree Improvement and Seed Centre.

Sample Silviculture Treatment Schedule

Opening Number (ARIS)	Harvest Area (ha)	Preliminary Strata Declaration	Activity	Activity Area (ha)	Season	Comment
HARN004-001	10	C	Mounding	4	Winter	

c) Map

As part of the reforestation program, a map may be requested (at Alberta’s discretion, the FHP map may be used) that identifies:

- I. all harvest areas to be treated, and all roads and stream crossings to be constructed or used (designating their season of use);
- II. all harvest areas from integrated operations;
- III. a silviculture access plan which includes location of access, method of access and location and type of crossing structures.

d) Summary of harvest area stratum declarations, stratum changes, final stratum & QAC adjustment (refer to Directive 2005-01 for details)

- I. a summary of stratum declarations by May 15 of the second year following the year of cut;

- II. a summary of stratum changes for openings establishment surveyed;
 - III. a summary of final stratum for openings performance surveyed;
 - IV. a summary of annual QAC adjustment, and net change in stratum area, based on final stratum, and
 - V. a final performance report – summary of total QAC adjustment for specific tenure and net change in stratum area by FMU 6 months prior to the end of the applicable 5 year quadrant production control period.
- e) **A listing of harvest areas where a declaration is proposed in lieu of a survey for areas not likely to meet regeneration standards (per TMR 141.9) and harvest areas where re-treatment is proposed (per TMR 142.1)**
- I. blocks where ‘let it grow’ is the retreatment strategy will require survey information supporting re-treatment rationale;
 - II. may be submitted for review and approval at any time throughout the year for approval to ensure timeliness of treatments.

See Section 12.0 REPORTING for reforestation activity reporting requirements.

8.3 SILVICULTURE OPERATIONS

GROUND RULES

- 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 All forest operators who are responsible for reforesting their timber disposition shall treat all harvest areas within two years from the end of the timber year when the harvest area received skid clearance. Non-stocked openings shall be treated within one year of failing an establishment survey.**
- 8.3.3 Establishment and performance regeneration surveys shall be conducted according to the procedures in the Reforestation Standard of Alberta (RSA).**
- 8.3.4 Herbicide, pesticide and fungicide use shall be performed in accordance with Alberta requirements.**
- 8.3.5 Site preparation equipment shall be cleaned and free of restricted and noxious weed seed or plant parts before entry into the working area or before mobilizing between projects according to Alberta requirements.**
- 8.3.6 Planting boxes shall be disposed of within 12 months of the completion of harvest operations (skid clearance) and are to be removed to an appropriate disposal facility if ground access exists or the block does not contain any debris piles. If ground access does not exist, boxes may be securely placed within existing debris piles for disposal by burning. All plastic shall be removed from boxes and disposed of at an approved waste disposal site prior to burning. Based on past operator performance to this issue, Alberta may condition the AOP to remove all boxes.**

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 silviculture 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. Following a long dry period in summer, the sensitive sites shall be scheduled accordingly.

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.**
- 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).**

Harvesting

- 9.3 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. Blocks less than 4 ha in size may have areas within the above categories up to seven percent with any exceptions to this requiring prior approval by Alberta.**
- 9.4 Operations shall not occur during heavy rainfall or when soil conditions are above field capacity (saturated).**

- 9.5 Operations shall cease within an area when instances of multiple ruts in a limited area are created that are clearly related to operations during unfavourable ground conditions. Ruts are defined in the Alberta Soil Conservation Guidelines (also see Glossary).**
- 9.6 Erosion and soil disturbance must be limited, with effort made to retain organic matter and soil nutrients.**

Post-harvest reclamation/reforestation

- 9.7 Site preparation creating linear disturbance patterns, shall be oriented to minimize channeling of water downslope.**
- 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 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.

The following ground rules do not supersede the management strategies of species of special management concern. Alberta will provide direction where insects or disease concerns overlap with strategies for species of special management concern.

GROUND RULES

10.1.1 Harvest plans and operations shall be prioritized in stands with insect and disease issues. Variance from the SHS 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, and 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 Protection ranking 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.

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 30 m wide mistletoe-free zone adjacent to the harvest area, or
- create a 30 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 Insect and disease assessment information shall be utilized in the CA. Where a CA is not required, the assessment information will be used to develop the GDP. Where new infestations are found, 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).

10.2 WEED MANAGEMENT

PURPOSE

To minimize the impact of noxious and prohibited noxious weeds in the Green Area.

DISCUSSION

The invasion of noxious and prohibitive noxious weeds in the forested area of Alberta negatively affects the integrity of the ecosystem. The invasive weeds alter natural processes and displace organisms that naturally occur in the area.

Under Alberta statutes, the occupant (or owner if there is no occupant) must destroy all prohibited noxious weeds and control all noxious weeds and prevent the spread or scattering of nuisance seeds.

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.

GROUND RULES

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

Table 3. Road Classification and Design

Road Description and Tenure	Planning Requirements	Layout	Design and Construction Descriptions		Borrow Pits	Timber Salvage	Debris	Erosion Control
			Right of Way					
			Clearing Width	Road Surface Width				
<p>Class I</p> <p>Primary Permanent</p> <p>All Weather</p> <p>20+ Years</p>	<p>Identified in higher-order plans, i.e., long term access plans.</p> <p>Phased planning approach shall be followed.</p> <p>DLO required.</p> <p>Detailed design plan (see “guidelines”).</p>	<p>Centre line marked. Side ribbons required.</p>	<p>30-40 m</p>	<p>8 – 12 m</p>	<p>Location identified prior to construction EFR or as per submitted temporary field authority (TFA).</p>	<p>As per TMRs and EFR under DLO.</p>	<p>Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.</p>	<p>Progressive reclamation 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.</p>
<p>Class II</p> <p>Secondary Permanent</p> <p>All Weather or Dry Weather</p> <p>5 – 20 + years</p>	<p>Identified in higher-order plans, i.e., long term access plans.</p> <p>DLO required.</p> <p>Detailed design plan: through route selection process a need for detail shall be assessed, i.e., need for cross-sectional profiles based on sensitive area identification.</p>	<p>Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.</p>	<p>20 – 30 m</p>	<p>5 – 10 m</p>	<p>Location identified prior to construction EFR or as per submitted TFA.</p>	<p>As per TMRs and EFR under DLO.</p>	<p>Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.</p>	<p>Progressive reclamation 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.</p>

Table 3. Road Classification and Design (continued)

Road Description and Tenure	Planning Requirements	Layout	Design and Construction Descriptions		Borrow Pits	Timber Salvage	Debris	Erosion Control
			Right of Way					
			Clearing Width	Road Surface				
<p>Class III</p> <p>Tertiary Permanent</p> <p>Winter or Dry Weather</p> <p>Up to 20 Years</p>	<p>Phased planning approach must be followed if road is to be used for more than five years.</p> <p>DLO Required if > than 3 years.</p>	<p>Centre line marked. Side ribbons may be required for DLO roads and sensitive sites.</p>	7 – 20 m	5-10 m	<p>Location identified prior to construction EFR or as per submitted TFA.</p>	<p>As per TMRs and EFR under DLO.</p>	<p>Total disposal. Stripping and fine debris to be retained for erosion control by spreading on cuts and fills and any other critical area.</p>	<p>Progressive reclamation 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.</p>
<p>Class IV</p> <p>Temporary</p> <p>Winter or Dry Conditions</p> <p>Up to three Years</p>	<p>Details to be addressed in development plans.</p> <p>Approved under the cover of an AOP.</p>	<p>Centre line marked.</p> <p>As-built inside harvest area road locations submitted annually in a mutually agreeable format</p> <p>Harvest area access roads mapped.</p>	7 - 20 m	5 – 10 m	<p>Location identified prior to construction or as per submitted TFA.</p>	<p>As per FHP.</p>	<p>Partial disposal. Mechanical or manual cutting of slash and debris to reduce fire hazard to acceptable levels.</p>	<p>Progressive reclamation 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.</p>

Table 3A - Road Classification for the Caribou Area

All other criteria from Table 3 apply to the roads in Table 3A

Road Description and Tenure	Season Of Operation	Clearing Width	Road Surface	Grade Description
Class 4F Temporary – up to three years	Frozen Ground (some roads or sections thereof may be accessible during dry periods)	Target = 10 m, with variable allowance for terrain conditions, to a maximum of 20 m.	8 m maximum	Target = no grade, recognizing some grade (maximum 0.5m) may be required on a site specific basis depending on terrain conditions. Ground disturbance to be minimized.
Class 3D/F Up to 20 years DLO Required if > than 3 years.	Dry or Frozen Ground	Target = 15 m, with variable allowance for terrain conditions, to a maximum of 20 m.	Target 6 m, to a maximum of 8 m for (one way traffic) Target 7 m, to a maximum 8 m (for two way traffic)	Target = grade to be minimized, recognizing some grade (range 0 to 0.5 m) may be used depending on site specific terrain conditions.
Class 2D/F 3– 20 years DLO Required	Dry or Frozen Ground	Target = 20 m, with variable allowance for terrain conditions, to a maximum of 30 m.	8 m	Target = no grade to 0.5 m, maximum 1 m, depending on site specific terrain conditions.

11.2 ROAD PLANNING AND DESIGN

PURPOSE

To outline the plan to construct, maintain and reclaim roads.

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.

Long term road corridor plans shall be developed in the FMP (if applicable) that meet the requirements of Phase 1 corridor plans as identified below in section 11.2.2. All road construction, maintenance and reclamation shall be directed by strategies outlined in the FMP.

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 Long-Term Roads (Class I, II, III)

Road Planning

11.2.1.1 Forest operators shall annually submit a road corridor plan and construction schedule in the GDP. Proposed variances from the FMP long-term corridor plan (if applicable) require Alberta's approval. 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, including corridors approved in the FHP;
- access control points (see section 11.5 Access Control),

Tables describing proposed road targets, current status and completed activities (examples below).

Proposed Road Schedule

Comp./ Ops. Area	Road Identifier	Phase 1 Submission	Phase 1 Approval	Phase 2 Submission	Phase 2 Approval	Phase 3 Constructio n	Tenure
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Current Road Status

Comp./ Ops. Area	DLO Number	Road Class	Status	Length	Crossings	Access Control	Tenure
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Completed Road Activity (for previous year)

Comp./ Ops. Area	DLO Number	Activity	Date	Comments
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11.2.2 Phased Planning Process

Phase 1: Corridor Planning

11.2.2.1 The corridor planning process may commence at any time during the year provided that the corridor has been identified in the road plan and dialogue with Alberta has been initiated.

11.2.2.2 The Phase 1 corridor plan for new road proposals requires the forest operator to work with Alberta to:

- a) identify the corridor and potential alternatives;
- b) identify other overlapping industrial users and work towards an integrated access/corridor strategy;
- c) rationalize the corridor based on timber considerations, i.e., summer vs. winter access;
- d) highlight potential impacts on other forest resources, such as:
 - watercourses,
 - fish and wildlife habitat,
 - grazing dispositions,
 - soils,
 - trappers,
 - protected areas,
 - recreation areas;
- e) identify measures designed to mitigate impacts, (e.g., timing constraints during construction and access control requirements).

11.2.2.3 The corridor plan shall be submitted prior to road construction in a time frame acceptable to Alberta.

11.2.2.4 Forest operators with overlapping tenures shall consult each other to ensure consistency in their corridor planning.

11.2.2.5 Forest operators shall advise other industrial operators of their road plans and strive to integrate road access with those operators.

11.2.2.6 Corridor plans shall follow the direction in strategic land use plans and policies.

11.2.2.7 The review and approval process is as follows:

- a) two months for review by Alberta –comments back to the forest operator;
- b) forest operators shall address any concerns prior to resubmission;
- c) Alberta shall approve within one month of final submission, provided no deficiencies exist;

- d) Alberta may identify in the approval additional requirements to be submitted with Phase 2, based on site sensitivity.

11.2.2.8 Exceptions to this process may arise (e.g., a salvage scenario). A written proposed action plan to vary from the indicated timelines must be submitted by the forest operator documenting the reasons for the modified review and approval process. Both the forest operator and Alberta recognize that time may be of the essence.

Phase 2: Detailed Planning

11.2.2.9 In order to reduce submissions and avoid duplication, Phase 2 shall consist of the DLO application process on the Phase 1 corridor.

Phase 3: Construction

11.2.2.10 Road construction shall be carried out as per Table 3 as well as conditions specified in the letter of authority for the DLO.

11.2.2.11 Upon request by Alberta, the road centre-line, as-built, in a format acceptable to Alberta, shall be submitted to Alberta by the forest operator within 90 days of construction.

11.2.3 Temporary Roads: Class III and Class IV (with lifespans up to three years from start of construction).

11.2.3.1 These roads shall be built as per the approved AOP. Only roads with FHP approvals shall be included in the AOP submission. Upon request, as-built road plans shall be submitted to Alberta by the forest operator in a format acceptable to Alberta.

11.2.3.2 The forest operator shall submit a table tracking the status of all non DLO roads over two years old until they are totally reclaimed. These roads shall be reclaimed as soon as timber operations are complete, within three years of construction, or as otherwise approved by Alberta.

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, road comments, and any additional conditions approved in the FHP.

11.3.1.3 Roads and landings shall be constructed to avoid:

- a) 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.

11.3.2 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 The fill required for road construction shall be taken from the ROW when feasible.

11.3.2.5 All borrow pits required off the ROW must be authorized by Alberta or an appropriate land use disposition before they are developed.

11.3.2.6 All sand and gravel pits off the ROW must be authorized under an appropriate disposition.

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

11.3.2.8 Active long-term roads shall be properly maintained to reduce wheel or track ruts, and to minimize watercourse sedimentation from erosion and traffic during adverse weather.

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 Constructed roads require erosion control and stabilization of disturbed soils.

11.3.3.4 Ditches shall be constructed to the same gradient as the road and shall be deep enough to drain the sub-grade, unless limited by topography. Ditch backslopes shall have a regular profile from the top of the cut to the bottom with no hanging banks or vertical cuts.

11.3.3.5 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.

11.3.3.6 Cross-drainage culverts and other drainage devices shall be installed as road sub-grade construction progresses. Cross-drainage structures shall:

- a) reduce water movement along ditches;
- b) divert water from the ROW into the surrounding vegetation directly as possible;
- c) provide cross movement for water from seeps and springs;
- d) be installed with adequate spillways or downspouts where they drain onto unstable or bare soil.

11.3.3.7 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

11.3.4.1 Roads not under DLO that are no longer required shall be reclaimed, have crossings removed, and their condition monitored until they are considered satisfactorily stabilized (see 11.3.4.7).

11.3.4.2 Certified weed free seed shall be used when seeding is used for reclamation.

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

11.3.4.4 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.

Seasonal Reclamation

11.3.4.5 Certain roads that are not used continuously throughout the year may require intermediate erosion control measures such as:

- a) shallow surface cross ditches based on slope and soil type;
- b) re-established drainage;
- c) slope stabilization;
- d) rut-free driving surface establishment;
- e) access control measures.

Partial Reclamation

11.3.4.6 Roads that are not immediately required but necessary for future operations shall be reclaimed to the following standards unless otherwise approved in the AOP:

- a) watercourse crossing and drainage structures that have a high risk of erosion or failure are removed, and stream banks and approaches reclaimed;
- 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) access closure structures are installed where required.

Total Reclamation

11.3.4.7 Roads and associated bared areas that are no longer required shall be permanently reclaimed 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 (see section 11.4.27);
- c) cross-ditching, rolling back topsoil (including slash and logging debris) and re-vegetating a minimum of 90% crown coverage of erodible bared surface areas;
- d) reforesting disturbed areas inside harvest areas and where mutually agreed to, outside of the harvest area;
- e) establishing access closures where required;
- f) where agreed to by Alberta, the company may leave ATV access for Silviculture purposes. Rollback shall be done on approaches to all watercourses.

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 for additional information on the implications of the Federal Fisheries Act).

GROUND RULES

11.4.1 The company shall require approval for any crossing not listed in Table 4 for the appropriate watercourse type.

Table 4. Acceptable Crossing Structures

Stream Classification	Acceptable Structure	
	Non-Frozen	Frozen
Ephemeral	Log Fill Culvert Bridge	Log Fill Snow Fill Culvert Bridge
Intermittent	* Log Fill Culvert Bridge	Log Fill Snow Fill Culvert Bridge
Transitional Small Permanent	Culvert Bridge	Log Fill Snow Fill Culvert Bridge
Small Permanent	Culvert Bridge	Snow Fill Culvert Bridge
Large Permanent	Bridge	Bridge

*Flow is not impeded.

- Notification of crossing type to Alberta is required on the first block status report after installation.
- Any change within a category only requires notification to Alberta.

- 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:**
- a) long-term roads (Class I – III) – shall be designed for a minimum of 1:50 year flood levels; and**
 - b) temporary roads (Class IV) – 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 the watercourse must 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 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 open at all times. Any culvert 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 as per Table 4. 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 watercourses within harvest areas shall be avoided when possible. When the crossings 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; a snow cap may have less than 1.5 m overhang;
 - 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) cables laid under logs to allow for easy removal, or other provisions for removal that do not disturb the banks or 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 seven days of the occurrence.

11.4.23 A native timber bridge may be used on watercourses as per Table 4 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 watercourses as per Table 4 provided that all of the following requirements are met:

- a) sufficient clean snow exists to fill creek channel;
- b) bank integrity is maintained;
- c) any soil cap installed over the snow is removed prior to break-up;
- d) measures are in place to prevent soil or other debris from entering stream channel or ice surface;
- e) stream flows are 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) if alterations to streambed or bank are required, appropriate approvals 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.

11.4.27 Watercourse crossings that are no longer required shall be reclaimed with the objective of minimizing any sediment from entering the watercourse. Their condition shall be monitored annually until they are satisfactorily stabilized meeting the following requirements:

- 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 90% of erodible bared surfaces with

vegetation capable of maintaining bank stability (this may include the use of sedges and willow cuttings).

11.5 ACCESS CONTROL

PURPOSE

To manage existing and proposed surface access recognizing key resource values.

DISCUSSION

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 CA 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, crossing removal);
- road condition (e.g., berms, ditches, road standard, selective grade removal, roll-back, no snow removal);
- regulatory (e.g., sanctuaries, timing restrictions, signage).

GROUND RULES

11.5.1 Where access control has been identified as an objective in strategic land use plans, Alberta shall consult with the forest operator to determine an access control strategy. In the event that a strategic land use plan has not been developed, the FHP shall describe specific access control methods identified in the GDP or FMP (see section 3.4).

11.5.2 In designated areas, Alberta may direct forest operators to restrict road access during specified periods, implemented in accordance with Alberta policy. Restricted access issues shall be dealt with differently depending on whether the road is new access or is existing access. All closures of existing access must be submitted to the Minister or his authorized delegate for approval whereas new access shall have the terms defined in the approval of the disposition.

11.6 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 km;
- 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;
- temporary fuel storage sites shall not be located within 100 m of any flowing watercourse;
- 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

- 11.6.1 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.**
- 11.6.2 Any facility or camp must adhere to all provincial regulations related to the camp (i.e., Public Health Act – *Work Camp Regulation*).**
- 11.6.3 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).**

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.

GROUND RULES

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 Reports based on the 2006-04 directive shall be submitted to Alberta once per month or at agreed to intervals. As built harvest area maps shall be submitted as per section 3.3.**
- 12.0.4 As built plan (includes digital shape files or other approved digital format of harvest boundaries, road location, road percentages, and added watercourse crossings) from the previous year's harvest shall be submitted as per Directive 2015-02. The as built shall include opening number, block number, block area, skid clearance date and any amendments made during operations. The as-built plan shall be submitted annually with the GDP submission; or no later than September 15 as per 3.3.6 (h).**

APPENDIX 1 - GLOSSARY

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 global positioning system (GPS) technology capable of 3 m 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	A timber disposition issued under Section 22 of the Forests Act authorizing the permittee to

permit (CTP)	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 FMU for which operational plans are developed. For FMU F23 the compartments are divided up into the south and the north compartment with the Peace river being the dividing line between compartments.
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 Government of Alberta 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]

Forestry Program Manager	The senior Alberta manager located at a Forest Area charged with supervision of all forest management activities in a Forest Area. It may also mean someone else who is authorized to approve an AOP.
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)	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: 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. The FMA gives the FMA holder the right to access Crown fibre. In return, the FMA holder 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.
Growing Stock	The sum (by number, basal area or volume) of trees in a forest or a specified part of it.
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>
Laid out	Field assessment of harvest blocks and roads (on the ground) required prior to submission of Forest Harvest Plan(s); also includes the delineation/marketing of both harvest area boundaries and roads on the ground. Examples of delineation/marketing include but are not limited to: ribbon, paint or other means approved by Alberta.
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.
License of occupation (LOC)	A disposition issued by Alberta authorizing occupation of a linear corridor, often for an access road.
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.
Pattern	The arrangement of forest stands or harvest units.
Permanent roads	Roads that will be in use for more than three 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; reseeded 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.
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.
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 three years of construction.
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.
Understory	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 understory	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 that connects two forested areas.
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
FGL	Forest Grazing Lease
FERIC/FP Innovations	Forest Engineering Research Institute of Canada
FHP	Final 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
LOC	License of Occupation
LSAS	Land Status Automated System
NSR	Not Satisfactorily Restocked
OGRs	Operational Ground Rules
PCT	Pre-commercial Thinning
PNT	Protective Notation
PSP	Permanent Sample Plot
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
SRD	Alberta Sustainable Resource Development
STIAA	Seed and Tree Improvement Association of Alberta
TFA	Temporary Field Authority
TMR	Timber Management Regulation made under the Forests Act
TSA	Timber Supply Analysis

APPENDIX 2 FHP/AOP CHECKLIST

Forest Harvest Plan Checklist				
Area: _____	Disposition Number: _____			
Company: _____	Date Disposition Issued: _____			
Submission Date: _____	Date Disposition Expires: _____			
APPROVAL ITEM	Yes/No (Company)	INITIALS/DATE (Agriculture and Forestry - AAF)		
1) Has the FHP been validated by an RFP?				
2) Is the SHS Variance <20% compartment/decade?				
3) Is the sum of proposed area to harvest and previously harvested area (since SHS approval) less than or equal to 100% of the SHS area?				
4) Does the FHP adhere to all Ground Rules?				
	Company (Y/N/A)	Company Comments (optional)	AAF (Y/N/A)	AAF Comments (optional)
A. Administrative Considerations				
<ul style="list-style-type: none"> • Has a copy of the FHP been provided to: <ul style="list-style-type: none"> - Area Forester? - Forest Officer? - Fish & Wildlife? - Other? _____ • Is the FHP consistent with approved higher order plans (DFMP, SHS, ODP)? • Has the required disposition been issued and is active? • Is the FHP complete and legible? <ul style="list-style-type: none"> - maps - block tables - detailed harvest area plans where requested 				
B. Utilization				
<ul style="list-style-type: none"> • Does the utilization standard match tenure document? • Are the deviations from utilization standards identified, explained and justified (rub points, high stump, retention, etc)? If there are no deviations, enter N/A. 				
C. Ground Rule Deviations - Complete if answered "NO" to Approval Item #4 (top of page), otherwise enter N/A				
<ul style="list-style-type: none"> • Have all the blocks containing ground rule deviations been identified? • Has an explanation and justification been provided for all ground rule deviations? 				
D. Integration with Other Users				
<ul style="list-style-type: none"> • If the plan is not integrated, has an explanation and justification been provided? • Has the recipient of incidental volumes and chargeability been identified? If there are none, enter N/A. • Have all the affected trappers been identified and contacted? If there are none, enter N/A. • Have known trapper cabins, trails and other improvements been identified and integrated into the plan? If there are none, enter N/A. • Have known recreational groups been identified and contacted where issues have been observed? If there are none, enter N/A. • Has a GTA been completed and grazing disposition holders been contacted (Directive 2006-01)? If there are none, enter N/A. • Have the required historical resource assessments been completed and, if necessary, integrated into the plan? • Have all issues raised by other users or the public regarding this plan been documented? If there are none, enter N/A. • Have potential land use conflicts been documented and mitigated (PNT, CNT, road use agreements, etc)? If there are none, enter N/A. 				
E. Access Management (temporary access only)				
<ul style="list-style-type: none"> • Have access management measures been described and identified (location, timing, signage, etc)? If there are none, enter N/A. 				
F. Sensitive Sites				
<ul style="list-style-type: none"> • Have aesthetic/recreation concerns been addressed? If there are none, enter N/A. • Have water source areas been identified and potential impacts mitigated? If there are none, enter N/A. 				
G. Road Design				
<ul style="list-style-type: none"> • Have the location, design and width of temporary road corridors been identified? If there are none, enter N/A. • Has a list of watercourse crossings including watercourse classification been provided? If there are none, enter N/A. • Have any crossings not exempt under the Water Act been identified? If there are all exempt, enter N/A. • Have existing access/DLOs which have been integrated into the plan been identified on the map? If there are none, enter N/A. 				
H. Wildlife				
<ul style="list-style-type: none"> • Have wildlife zones within the planning area been identified and incorporated into the plan (as per OGR Section 7.7)? If there are none, enter N/A. • Have blocks with timing restrictions been identified? If there are none, enter N/A. • Have all known sensitive wildlife sites been addressed (mineral licks,aptor nests, den sites, etc)? If there are none, enter N/A. 				
I. Insect, Disease & Fire				
<ul style="list-style-type: none"> • Does the FHP comply with direction provided in Community Fireman Plans? If there are no plans, enter N/A. • Have known insect and disease infestations been identified and described? If there are none, enter N/A. • Have mitigation strategies for infestation, diseases or endangered timber been described? If there are none, enter N/A. • Have debris disposal methods been identified? 				
J. Silviculture				
<ul style="list-style-type: none"> • Have all watercourse crossings and/or roads that will be maintained for silviculture purposes been identified? • Has a pre-harvest status declaration 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 deems the FHP is inaccurate or deficient in content.</p>				
Company Validation				
_____		_____		_____
Submitting RFP Validation		Company		Date
AAF Validation				
_____		_____		_____
Reviewing RFP Validation		Date		

Note: This Checklist should reflect regional or FMA Operating Ground Rules - this is a template.

Annual Operating Plan (AOP) Checklist				
Area	Volume Summary (m3)	Conifer	Deciduous	
Company	Quadrant Allowable Cut			
Disposition Number	Quadrant Production to date			
Date Disposition Issued	Quadrant Volume Remaining			
Date Disposition Expires	Proposed Production (AOP year)			
Submission Date				

APPROVAL ITEM	YES/NO (Company)	INITIAL/DATE (Agriculture and Forestry - AAF)
Validated by RFP		
ACP has an approved FHP(s)		

	Company (Y,N,N/A)	Company Comments (optional)	AAF (Y,N,N/A)	AAF Comments (optional)
Administration				
Have digital copies of AOP been provided (if required) to:				
- Area Forester				
- Forest Officer				
- other				
Have any FHP conditions been addressed? If there are none, enter N/A				
Is the Company requesting does relief with an explanation and justification?				
Have any amendments to AOP components been submitted and justified (reforestation program, GDP, FHP)?				
Operating Schedule (as per section 3.5.4 c)				
Has a table been submitted for all blocks scheduled for harvest including area & volume by species with totals?				
Has a list of temporary roads proposed for construction, maintenance & reclamation including watercourse crossings to be built or installed or removed/maintained been provided?				
Has a declaration of outstanding operational items, or an agreement with Alberta on reporting of outstanding operational items been provided?				
Have outstanding operations been identified (debris disposal, hauling, clean-up, reclamation, etc)?				
Are requested amendments to any AOP components explained (reforestation program, road plan, etc)?				
Applicable Forest Harvest Plans (as per section 3.4)				
Do all blocks and roads included in the ACP have FHP approval?				
Reforestation Program (as per section 8.2)				
Is the proposed silviculture treatment schedule provided?				
Are summaries of stratum declarations, stratum changes, final stratum, QAC adjustments provided?				
Proposed blocks are listed for declaration in lieu of survey & re-treatment				
Are seed inventories sufficient as per FORMS manual section 11.2 or otherwise approved by AAF?				
Wildfire Protection (as per section 7.3)				
Is the Forest Protection Supplement complete and provided?				
Road Plan (as per section 11.2)				
Are all roads scheduled to be built under authority of the AOP planned to have a lifespan of <= 3 years?				
Is a table tracking the status of all non-DLO roads over two years old submitted?				
Are all required watercourse crossings documented in the monitoring program as per section 11.4.26?				
General Development Plan (as per section 3.5)				
Has a summary of variance as per section 4.1 been provided?				
Has a summary of volume supply by area been provided?				
Has an DLO road construction and reclamation schedule been provided?				
Has a GDP schedule & map as per section 3.3.6 been provided?				
Have consultation activities been completed as per the First Nations and Metis Consultation Guidelines?				

Company Sign Off

_____ Submitting RFP Validation _____ Company _____ Date

AAF Sign Off

_____ Revising RFP Validation _____ Date

Note: This Checklist should reflect regional or FMA Operating Ground Rules - this is a template.

AOP FHP Checklist FMU F23 2018