



Millar Western Forest Products Ltd.

Executive Summary

2007-2016 Detailed Forest Management Plan

November 15, 2007



EXECUTIVE SUMMARY

Company Profile

Millar Western Forest Products Ltd. is a family-owned company that has been active in Alberta's forest products industry since the 1920s, when founder J.W. Millar began a lumber business in Whitecourt. Today, the company operates sawmills in Whitecourt, Boyle and Fox Creek, Alberta, and a bleached chemi-thermo-mechanical pulp (BCTMP) mill in Whitecourt. It employs 700 people on a full-time basis and hundreds more on a seasonal basis in its forest management operations, making it a major employer in the communities where it operates. Millar Western produces a total of 480 million board feet of lumber and 300,000 air-dried metric tonnes of softwood and hardwood BCTMP per year, for shipment to customers in North America and around the world.

Scope and Purpose of the DFMP

Millar Western is required to develop long-range Detailed Forest Management Plans (DFMP) at 10-year intervals for its defined forest area (DFA), as specified in its Forest Management Agreement (FMA) with the Government of Alberta. The purpose of a DFMP is to provide general direction for sustainable forest management over a 200-year planning horizon and lay the groundwork for more specific operational activities over a shorter 10-year timeframe. It is the highest-level plan produced in a hierarchy of management and operational plans, all of which differ in terms of scope, timeframe, and detail.

The DFMP is composed of several components that, in combination, will provide strategic direction to Millar Western's sustainable forest practices over the period 2007-2016:

- *Timber Supply Analysis (TSA) - a derivative of the forecasting process, the TSA predicts forest growth patterns and is used to determine recommended harvest levels for all forestry companies operating on the FMA area. Once approved by the Alberta government, these recommended harvest levels become the annual allowable cut (AAC).*
- *Preferred Forest Management Scenario (PFMS) - a derivative of broad-based stakeholder consultations and the forecasting process, the PFMS includes the values, objectives,*



indicators and targets (VOITs), which outline the company's sustainable forest management objectives and the strategies for achieving them.

- *Spatial Harvest Sequence (SHS) - a list of landbase polygons that define the harvest schedule for two 10-year periods. These polygons are used to develop Final Harvest Plans, which will cover blocks included in annual operating plans (AOP).*
- *Commitments - obligations over and above the VOITs that company has committed to achieving within the DFMP's timeframe.*

As well as an overview of Millar Western's forest management strategy for 2007-2016, the first seven chapters of the DFMP provide a physical description of the company's forest management area, a review of previous long-term forest management plans, a detailed explanation of the DFMP development process and forecasting methodology, and a discussion of emerging forest management issues. The appendices referenced in the main body of the DFMP contain supporting data and documentation, as well as implementation plans.

Landbase Description

On May 14, 1997, the Government of Alberta granted Millar Western a Forest Management Agreement (FMA), giving it the right to establish, grow, harvest and remove timber from a specified landbase. Millar Western's FMA area initially comprised Forest Management Unit (FMU) W13, with a gross area of 301,873 hectares, but was expanded on July 25, 2002, to include FMU W11. As shown in Figure 1, the addition of W11 increased the company's Gross FMA area by 176,634 ha, to 478,507 hectares.

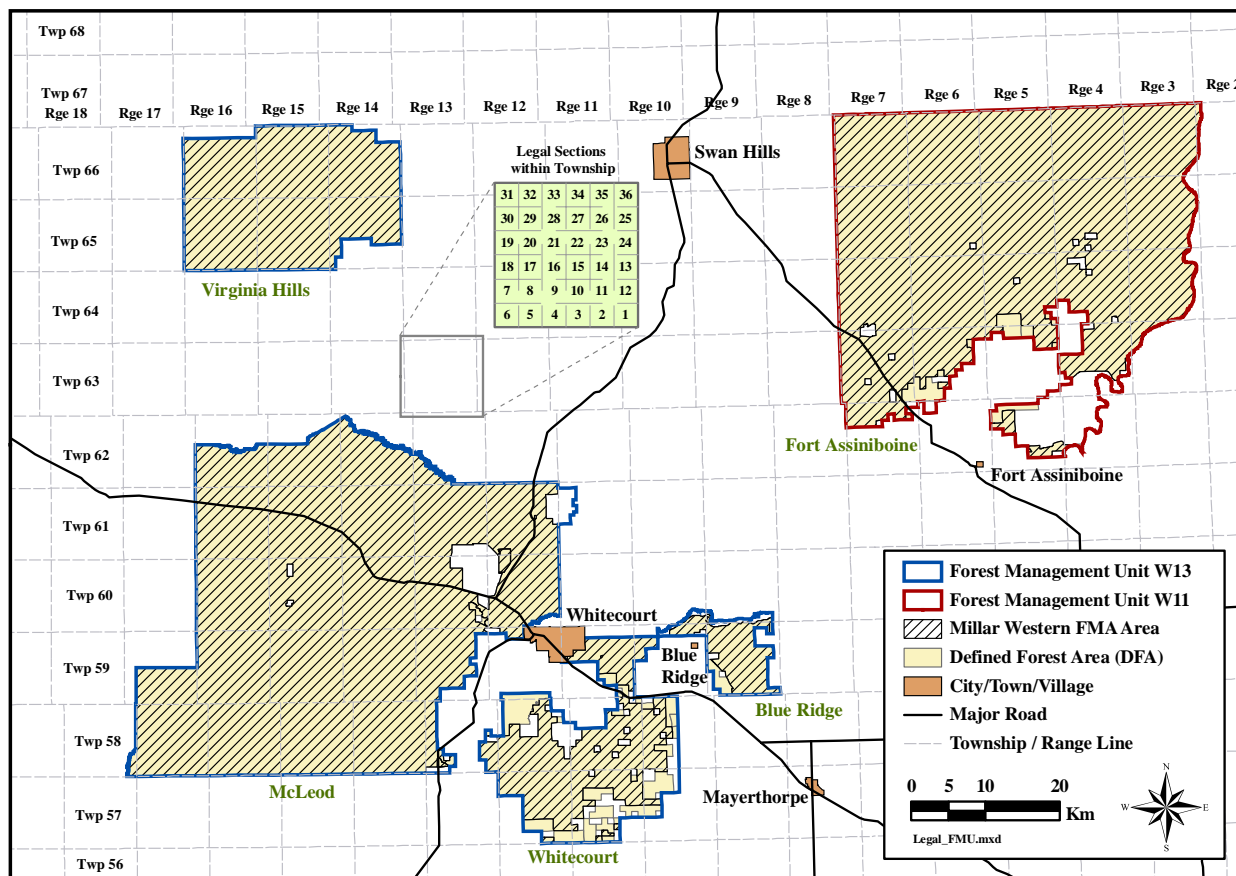


Figure 1. Millar Western FMA area

Table 1 summarizes the four landbases most commonly referenced throughout the 2007-2016 DFMP. The Gross FMU Landbase is the combined area of the two FMUs (478,507 ha). The Gross Defined Forest Area (DFA) is composed of the Gross FMU Landbase, excluding private land, parks and First Nations’ land (453,233 ha). The Forested DFA is the Gross DFA Landbase, excluding clearings and areas without inventory information (417,468 ha). The DFA Managed Landbase is the DFA Forested Landbase, excluding inoperable areas (*e.g.* riparian buffers) and unproductive forested stands (293,784 ha). The DFA Managed Landbase is the area upon which the AAC is calculated and forms the basis for the spatial harvest sequence, which identifies harvesting locations through time.

Table 1. Summary of landbases.

Landbase	Area removal (not comprehensive)	W11 (ha)	W13 (ha)	Total (ha)
Gross FMU	N/A	176,634	301,873	478,507
Gross DFA	Private, protected and First Nation's land	165,798	287,435	453,233
Forested DFA	Dispositions, areas w/o AVI	147,765	269,703	417,468
Managed DFA	Water buffers, black spruce reduction	87,369	206,415	293,784

Millar Western’s DFA lies within the Boreal and Foothills Natural Regions of Alberta’s ecological classification system. Within the DFA, a total of 123,972 ha (27%) is classified as wetlands. The Athabasca River, which originates from the Columbia Glacier in Jasper National Park and empties some 1,500 km later into Lake Athabasca, is the most prominent water body in the area. Millar Western’s DFA experiences a continental climate characterized by short, cool summers and long, cold winters, with relatively low annual precipitation.



The tree species composition of both the Gross and Managed DFA landbases is summarized in Table 2. The Managed DFA Landbase is dominated by aspen (38%) and pine (27%). Pure conifer stands, pure hardwood and mixedwoods comprise 41%, 38% and 23%, respectively, of the managed area.

Table 2. Summary of species composition on the Gross and Managed DFA Landbases.

Species Strata	Gross Landbase						Managed Landbase					
	W11		W13		W11 & W13		W11		W13		W11 & W13	
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)
Deciduous Broad Cover Group (D)												
Aspen	56,566	38%	67,384	25%	123,949	30%	53,185	61%	57,786	28%	110,971	38%
Birch	142	0%	1,238	0%	1,380	0%	130	0%	1,105	1%	1,235	0%
Total	56,707	38%	68,622	25%	125,329	30%	53,316	61%	58,891	29%	112,207	38%
Deciduous / Coniferous Broad Cover Group (DC)												
Aspen/Pine	1,927	1%	6,413	2%	8,340	2%	1,505	2%	5,987	3%	7,492	3%
Aspen/Spruce	5,639	4%	21,782	8%	27,421	7%	4,875	6%	19,096	9%	23,971	8%
Total	7,566	5%	28,195	10%	35,762	9%	6,380	7%	25,083	12%	31,463	11%
Coniferous / Deciduous Broad Cover Group (CD)												
Pine/Aspen	2,234	2%	10,871	4%	13,105	3%	1,555	2%	10,272	5%	11,827	4%
Spruce/Aspen	5,554	4%	19,940	7%	25,493	6%	5,066	6%	17,730	9%	22,796	8%
Total	7,787	5%	30,811	11%	38,598	9%	6,621	8%	28,001	14%	34,623	12%
Coniferous Broad Cover Group (C)												
Larch	25,536	17%	6,523	2%	32,059	8%	N/A	N/A	N/A	N/A	N/A	N/A
Pine	13,351	9%	70,743	26%	84,094	20%	11,588	13%	66,718	32%	78,307	27%
Black spruce	26,399	18%	43,473	16%	69,872	17%	N/A	N/A	10,805	5%	16,805	6%
White spruce	10,419	7%	21,336	8%	31,755	8%	9,463	11%	16,917	8%	26,380	9%
Total	75,704	51%	142,075	53%	217,779	52%	21,051	24%	94,440	46%	121,492	41%
Grand Total	147,765	100%	269,703	100%	417,468	100%	87,369	100%	206,415	100%	293,784	100%

Forests are typically made up of five different age groups called seral stages: regenerating, young, immature, mature and old trees. One of the goals of sustainable forest management is to maintain a proportional representation of each age class, to ensure, among other things, the preservation of habitat for a wide range of forest dwellers and a continual supply of timber for forestry companies. Generally speaking, the Millar Western DFA, and indeed much of Alberta’s forested area, can be characterized as having an over-abundance of mature and over-mature forest, one of the results of successful fire suppression over recent decades. Exceptions are the Virginia Hills compartment, which experienced a massive fire in 1998 that burned over 100,000 hectares of forest in Millar Western’s and Blue Ridge Lumber’s FMAs. This fire is responsible for the large amount of area in the regenerating seral stage or 0-20 year age class. In W11, a large portion of the older-aged forest is composed of deciduous stands.

In order to understand the company’s forest management strategy as presented in the 2007-2016 DFMP, it is important to realize the proportion of the forested landbase that is composed of pine. The proportion of pure and mixedwood pine, by seral stage on the managed DFA landbase is 31%, 7% of which falls into the mature and old seral stages. In order to reduce the forest’s susceptibility to mountain pine beetle, Millar Western will be focusing its harvesting activities over the next 10 years on mature-, old- and mixedwood pine stands.

Previous Management Plans

One of the requirements of a DFMP is to review past plans and provide an update on progress made in achieving their objectives. Over the past 10 years, Millar Western’s forest management activities have been guided by several different plans. After receiving its FMA in 1997, which at the time consisted only of Forest Management Unit (FMU) W13, Millar Western submitted to the Alberta government a Preliminary Forest Management Plan (PFMP), which was followed by a more comprehensive DFMP in 2000 (though submitted in 2000, it is entitled the *1997-2006 DFMP*). With the expansion of the FMA in 2002 to include W11, Millar Western developed a PFMP for the new area, which was submitted and



approved in 2004. The plan was intended to guide operations for three years, until the development and implementation of the 2007-2016 DFMP.

The 1997-2006 DFMP for W13 introduced several new concepts to forest management planning in Alberta: it was among the first to include spatial harvest sequences for the purpose of directing harvesting operation; it was developed with the input of Impact Assessment Groups (IAG) - teams of scientists and other specialists who brought a new level of science and scientific expertise into the decision making process; and it was influenced by the findings of the Biodiversity Assessment Project (BAP), which developed coarse and fine-filter spatial biodiversity assessments to analyze management alternatives with respect to their impact on biological values. The 2004 PFMP, moreover, set a new annual allowable cut and spatial harvest sequence for W11, and involved local operators to a greater degree in order to better meet forest management objectives for the area.

As part of its monitoring program, Millar Western issued a 1997-2001 Stewardship Report, covering the first five years of the implementation of the 1997-2006 DFMP for FMU W13. This report is available on the company's website: www.millarwestern.com/publication.php. A stewardship report covering the last five years of the 1997-2006 DFMP and the 2004 PFMP for W11 will be produced in 2008. An interim report on the status of key commitments arising from these plans can be found in Chapter 4. As well as providing a progress report, *Chapter 4 - Previous FMPs and Significant Events* also establishes linkages between these former plans and the 2007-2016 DFMP, ensuring continuity and ongoing improvement in Millar Western's sustainable forest management practices.

2007-2016 Planning Process

Millar Western's 2007-2016 DFMP was developed over a three-year period beginning in 2004. With a view to continuously improving its practices, Millar Western adopted an adaptive management approach. Adaptive management focuses on a three-phase cycle of planning, implementation, and monitoring and evaluation to adapt to emerging science, the lessons of experience and changing public expectations.

At an early stage, it became evident that, to effectively address its wide ranging objectives as well as additional input from the public and other stakeholders, Millar Western would need to assemble a multi-disciplinary plan development team (PDT) larger than that put together for the 1997-2006 DFMP. As well as company staff, the effort involved quota holders, scientists, specialists in forest management, government representatives and other stakeholders. The larger PDT was composed of several groups, including the Steering Committee, which provided direction to other PDT groups; Impact Assessment Groups (IAGs), which were responsible for devising scientifically sound means for evaluating the potential impacts of forest management activities on non-timber values such as water, habitat and carbon; Landscape Project Groups (LPG), which addressed sustainability issues and cumulative impacts outside the scope of the DFMP; and a Peer Review Committee, which conducted scientific peer reviews of the approaches and findings of the IAGs and LPGs.

In accordance with its Public Consultation Policy, which is consistent with section 7.2 of CSA Z809-02, Millar Western established several public participation mechanisms to enable stakeholders to provide input, review plan components and provide recommendations to guide future forest management activities. Aboriginal consultation was conducted primarily through the Environmental Co-Stewardship Committee, which was formed in July 2004 under the Forestry and Economic Development Agreement (FEDA), an agreement between Millar Western and the Alexis Nakota Sioux Nation. The company also created a Public Participation Group (PPG) to review plan components and identify forest values for the company to accommodate and monitor over the DFMP's timeframe. In addition, Millar Western developed and distributed newsletters and flyers, and held several open houses over the course of the DFMP period, including a virtual open house on its website, to communicate with stakeholders and provide them with opportunities to participate in plan development.



Much of the effort in developing the DFMP went into the identification and refinement of values, objectives, indicators and targets (VOITs), which form the basis of the DFMP. The values and objectives set the strategic direction for the DFMP, while the indicators and targets provide operational direction to those implementing the plan. VOITs can come from several sources: some are specified in the Alberta Forest Management Planning Standard, while others are identified by PDT members and the public. At the very least, VOITs must be consistent with the requirements of the Canadian Standards Association's (CSA) Z809-02 standard (Sustainable Forest Management (SFM)) and address the six Canadian Council of Forest Minister's (CCFM) SFM Criteria, which are to conserve biological diversity, maintain and enhance the forest ecosystem condition and productivity; conserve soil and water resources; maintain forest ecosystem contributions; provide multiple benefits to society; and accept society's responsibility for sustainable development.

Millar Western's 2007-2016 DFMP has identified 53 VOITs that address a wide range of forest management objectives, including the following:

- Manage the forest for long-term sustainability within the natural range of variation;
- Maintenance of biodiversity, with a focus on the development of contiguous patches of old growth and the retention of critical stand structures during harvesting operations;
- Modification of the age-class distribution to improve the forest's resiliency to insects, disease and fire;
- Minimization of the effects of harvesting on water quantity and quality;
- Fulfillment of the fibre requirements of Millar Western and other forestry companies operating on the landbase;
- Development of forest regeneration strategies to meet long-term sustainability goals; and,
- Establishment of ongoing public consultation mechanisms, to ensure the company's forest management strategies reflect public priorities.

In compliance with CSA Z809-02, all VOITs were put through a public review process. Millar Western's PPG reviewed all pre-existing VOITs and suggested additional VOITs of its own, several of which were integrated into the final list. The review process and results are summarized in the group's report, which was submitted to Millar Western following the completion of their involvement (*Appendix IV - Public Participation Group Report*). As described in *Chapter 3 - Plan Development and Stakeholder Participation*, the VOITs were also reviewed by the plan development team, including other forestry companies operating on the DFA.

Once the VOIT values, objectives and indicators had been identified, a complex, iterative process called *trade-off analysis* was used to arrive at targets (specific, quantifiable goals that describe the desired state or condition of the indicator) for each indicator (variables that measure or describe the state or condition of the value). The various IAGs were asked to recommend targets for each of the VOITs that fell within their area of expertise. The targets suggested by the IAGs were run through the forecasting models as constraints, to see what impact they would have on other targets. The relevant IAGs would assess the results and, if necessary, revise them, then rerun them through the modeling process, creating new scenarios each time. This process would continue until a satisfactory balance among the targets was achieved. This continual loop of revision and rebalancing would eventually yield the PFMS, which would form the basis of the SHS, indicating where and when harvesting operations would be conducted over the next 20 years.



Challenges

Well into the development of its PFMS, Millar Western was forced to abruptly change course to address the arrival into Alberta of the mountain pine beetle (*Dendroctonus ponderosae*). Defying the predictions of many, the insect moved into Alberta from British Columbia, where it had inflicted significant harm on the B.C.'s forests. The beetle's detection in Alberta made it imperative that the company incorporate strategies for addressing the infestation in its DFMP. At its DFMP open houses in March 2006, Millar Western presented, among others, a scenario that called for a pine "surge" cut - an accelerated harvest of pine and mixed pine stands targeted at the mature and old seral stages. The company proposed to maintain the surge for the next 10 years, after which time harvest levels would drop down to long-term sustainable even-flow levels.

Shortly after the open houses, the Alberta government introduced the Mountain Pine Beetle Action Plan, a key component of which was the Healthy Pine Forest Strategy that called for efforts to reduce the forest's susceptibility to the insect. In response, the company refocused its harvesting plans on mature and over-mature pine stands, settling on a scenario similar to that presented at the March 2006 open houses. While Millar Western had set itself a goal of completing the DFMP by the fall of 2006, it required another year to reforecast its targets in response to the mountain pine beetle, which delayed the document's submission by one year. The reformulated PFMS was reviewed with key stakeholders, including the PPG, at various meetings throughout 2007, culminating with a final presentation to other forestry companies operating on the DFA in October.

Millar Western overcame this and other challenges, including the introduction of a new provincial planning standard and changes in data requirements for yield-curve development, and submitted its 2007-2016 DFMP to the Alberta government in November 2007. Representing the work of a team of close to 100 employees, experts and stakeholders, this long-range plan provides a progressive sustainable forest management strategy that, in keeping with Millar Western's objectives, significantly reduces the forest's susceptibility to the mountain pine beetle while accommodating an ever-growing number of forest values, ensuring that the forest resources under the company's management continue to confer economic, ecological, and social benefits for generations to come.

Strategic Forest Management Plan

Millar Western's strategy for the period 2007-2016 is outlined below. The elements of this strategy have been organized according to the Canadian Council of Forest Ministers six broad criteria for sustainable forest management. A complete VOIT table can be found in *Chapter 6 - Sustainable Forest Management Strategy* and *Appendix XXIII*.

CCFM Criterion 1: Ecosystem Diversity:

Access

Forest access roads are essential for managing the forest and provide opportunities for an array of other forest users. Road densities will be managed to reduce environmental impacts to the degree practical on both forest management units. Road locations will be designed to reduce road density, and the use of temporary or seasonal roads will be encouraged among operations staff (VOITs 4. 5).

Harvest

The principle means of meeting the targets associated with conserving ecosystem diversity will be to harvest stands identified in the SHS. In this way, the desired forest composition, structure and pattern will be attained in the future, thus conserving biodiversity values. A key driver in the development of the W13 SHS was the preferential selection of stands susceptible to mountain pine beetle for harvest



during the plan period. W11's SHS was developed to follow an oldest-first strategy and to balance harvesting operations across the FMU, which will contribute to greater operator integration.

Salvage harvesting following fire or blowdown is an important strategy for achieving targets under CCFM Criterion 5; Multiple Benefits to Society. However, these natural disturbances also play critical roles in maintaining ecosystem diversity (VOITs 7, 8). For this reason, up to 10% of burnt trees will be left in undisturbed patches within fire-salvage blocks, to maintain fire legacies.

Stand structure retention of live trees, snags and down woody debris is another important biodiversity conservation practice. Both single trees and small tree patches will be left, in harvest areas representing 1% of the total AAC (VOIT 11).

Riparian areas are important areas of connectivity between forest cover patches on the landscape and deserve careful consideration in laying out harvest blocks and in subsequent operations. Millar Western is committed to zero incidences of non compliance with Operating Ground Rules that relate to riparian area management (VOITs 9, 10, 13, 14). These same measures will be applied to water crossings and other sensitive sites to maintain aquatic ecosystem integrity and to protect rare ecosystems. Some riparian areas will be harvested as exceptions to this strategy as part of the FORWARD studies on water quality.

Most rare-plant communities are found in rare ecosites and wetlands that are not part of the SHS; however, rare-plant communities can occur in unmapped inclusions within stands selected for harvest. Millar Western operations are currently guided by a rare-plant listing associated with mapped ecosites, but, to enhance the protection measures for uncommon plant communities, the company will develop and implement a more refined process for identifying and protecting uncommon plant communities (VOIT 6).

A network of protected areas also helps conserve biodiversity. Consequently, there are no access routes or harvest areas proposed in protected areas (VOIT 18).

Renewal and Maintenance:

Millar Western will pursue an aggressive regeneration strategy with the aim of increasing the long term growth potential from the forest. The company's forest renewal strategy focuses on efficient and prompt regeneration of harvested areas and will continue to encourage natural regeneration, supplemented by natural seeding, planting and tending as required to create the desired future forest condition. The target is to meet the species composition distribution and silviculture intensities of the PFMSs within 10% (VOIT 25).

The W13 PFMS was developed to recognize the threat of the mountain pine beetle. Millar Western will incorporate the following elements into its forest renewal program over the term of the plan to address the additional regeneration requirements of the W13 MPB PFMS (applies to green tree harvesting, not salvage operations) (company commitment 8):

- Ensure that additional pine seed is collected in the short term, to build up seed inventories;
- Move to white spruce bias for future planting;
- Endeavour to leave pine stands for natural regeneration by
 - Evenly distributing sufficient quantity of pine cones across the cutover,
 - Planting white spruce, if insufficient pine cones exist, and
 - Considering pine-only plantings on drier southern exposures;
- Assess naturally regenerated stands for regeneration success and fill plant with white spruce wherever necessary;
- Achieve planting densities for maximum growth potential (1,500 - 2,000 spa);
- Consider larger seedlings;



- Ensure appropriate site preparation and stand tending;
- Ensure juvenile spacing of naturally regenerated stands where necessary;
- Fill-plant NSR deciduous stands with white spruce seedlings;
- Use black spruce seedlings sparingly, only in conditions where white spruce would not survive; and
- Ensure that a regeneration monitoring program is implemented, so that sufficient data is available to validate our future growth projections (company commitment 9).

Millar Western will also employ site preparation for planting and seeding, to enhance the growing environment for conifer seedlings. Since site-preparation methods such as brush-raking and prescribed fires can reduce the amount of downed woody debris, which is important for conserving biodiversity, Millar Western will instead use alternative treatments such as direct planting, trenching, mounding or intermittent patch methods of site preparation on the vast majority of sites, to help retain the downed woody debris content on harvested sites (VOIT 12). As they grow, some stands will require tending with herbicides, to ensure seedling survival and maximize seedling growth, maintain conifer dominance and ensure that the desired future forest conditions described in the PFMS are achieved.

Conservation of biological diversity includes the preservation of genetic resources. Maintaining networks of protected areas and special management zones like riparian zones and relying on natural regeneration will contribute to maintaining genetic diversity. To further manage for this criterion, planted seedlings will be grown from local seed sources, and Millar Western will continue to participate in tree improvement programs designed to maintain or increase genetic diversity and local adaptive characteristics (VOIT 16, 17).

CCFM Criterion 2: Ecosystem Productivity (VOITs 19-28):

In order to ensure that forest operations maintain and enhance forest ecosystem conditions and productivity, Millar Western will pursue a number of monitoring strategies. The goal is to maintain the health, vitality, and rates of biological production, which, in forest management, generally relate to the successful regeneration of harvested areas (VOITs 19, 20, 21); maintaining the landbase in a productive state (i.e. limiting the conversion of forested area to non-forest types such as roads and landings) (VOIT 22); protecting forest ecosystems from insect infestations or other calamities and mitigating the impacts of these events (VOITs 23, 24, 25, 26); protecting the forest from invasive species (VOIT 27); and monitoring overall ecosystem health (VOIT 28). In order to assess the prompt and successful regeneration of harvested areas, Millar Western will complete regeneration surveys on a regular basis.

As noted above, maintaining the productive landbase involves minimizing the amount of productive forest land lost to roads and landings, as well as to oil and gas exploration, pipeline construction, well-site development, and coal-bed methane development (VOIT 22). In addition to limiting road densities (VOITs 4, 5), Millar Western will pile and burn slash piles to recover productive land as well as to reduce fire hazards.

While the Government of Alberta has the authority to approve withdrawals from the landbase, which often results in long-term or permanent forest loss, Millar Western will pursue the following strategies to maximize forest retention:

- Participate in government consultation regarding integrated land management initiatives;
- Work with other users to develop common road access options; and
- Investigate initiatives that will re-introduce forestland into the DFA.

In addition, Millar Western will continue to monitor the amount of productive forest land over time, through regular inventory updates.



Ecosystem productivity can also be damaged by insect infestations, disease or other natural calamities. Through its monitoring efforts, Alberta Sustainable Resource Development (SRD) can detect these events at an early stage, which may allow for strategic or operational planning to mitigate impacts. Examples of this are the defensive harvest operations planned to address mountain pine beetle (MPB) (see VOIT 24, 26), and the timber recovery efforts in areas that have already seen MPB damage (VOIT 25). Currently, the presence of the MPB appears to be minor within the DFA; however, the infestation may increase significantly in the coming years. Therefore, in addition to the planned actions, Millar Western has committed to report all areas where insects, disease or other factors are affecting an area of 10 ha or greater (VOIT 23). The company has also developed a standard operating procedure and training program for identifying and reporting MPB. The company's monitoring efforts will be closely coordinated with the local Alberta SRD office.

In Alberta, the control of invasive species is frequently related to the reduction of noxious weeds, which may negatively impact nearby agricultural areas. Therefore, FMA holders will be required to implement and adhere to a noxious weed program. Millar Western will maintain its existing Noxious Weed Program, and revise it where necessary, following annual reviews (VOIT 27).

The maintenance of overall forest health is a key component of ecosystem productivity; however, it is often difficult to make an accurate assessment of the well-being of an ecosystem. For this reason, scientists have identified 17 indicator wildlife species that are more sensitive to environmental change than others and Millar Western will monitor their habitat as a way of assessing overall forest health over time (VOIT 15). Millar Western is also engaged in several related research projects, such as the Study of Forestry and Amphibians (SOFA) project, which will help to assess the impacts of forest harvesting on amphibians, which are key VOIT species for ecosystem health (VOIT 28). Another initiative is the FORWARD project, which is continuing its work in finding practical solutions to watershed management in the boreal forest. The FORWARD team is collecting information on weather, soils, soil microbial communities, groundwater, wetlands, vegetation, riparian and aquatic bio-indicators, stream flow and water quality, which will be incorporated into future long-term modeling for operations planning.

CCFM Criterion 3: Soil and Water Quality (VOITs 29-35):

The conservation of soil and water resources is a key component of forest sustainability. Therefore, in order to protect soil resources, Millar Western will adhere to the *Operating Ground Rules and Forest Soils Conservation Task Force Report* (AFPA/ALFD 1996 (VOITs 29, 30, 31).

To protect water quality, Millar Western will seek to maintain water quantity levels within acceptable ranges, as determined by forecasting models (VOITs 32, 33). In addition, Millar Western is supporting the FORWARD project. By assessing links between forest operations and water quality and quantity, this research initiative will help Millar Western to operate in a manner that will maintain or improve water quality within and downstream of the DFA (VOIT 34).

Millar Western will also maintain riparian buffers along waterways in the DFA, in accordance with the Operating Ground Rules or other Alberta-approved riparian management strategies (VOIT 35).

CCFM Criterion 4: Global Ecological Cycles (VOITs 36-37):

Healthy forest ecosystems should contribute to the health of global ecological cycles. Today, the carbon cycle is of particular interest, due to the concern around global warming, driven, to a large extent, by excess carbon in the atmosphere. Forest ecosystems can act as either a sink (absorbing and storing carbon through plant growth) or a source of carbon (releasing carbon through fire or decomposition). To determine the role the DFA plays in global ecological cycles, Millar Western has



completed a carbon budget analysis as part of the forecasting for the 2007-2016 DFMP (VOIT 36), which is contained within *Appendix XV - Carbon Accounting on the DFA*. The DFA is currently a carbon sink, but the MPB infestation and the strategies required to control it push the forest into a carbon source. Forest regeneration activities begin to offset this loss and eventually move the forest back into a carbon sink in about another 80 years, a condition the forest maintains for the remainder of the 200-year planning horizon. Because the percent change in the managed (and forested) landbase can also play a role in carbon cycles, Millar Western will work with the Alberta government, to minimize land withdrawals on the DFA (VOIT 37).

CCFM Criterion 5: Multiple Benefits to Society (VOITs 38-45):

In its management of the forest, Millar Western seeks to maintain, for present and future generations, the many benefits the forest and the forest industry confer on society - economic (e.g., employment, tax revenues), social (e.g., contributions to local communities, recreation) and ecological (e.g., maintaining biological diversity). The establishment, approval and implementation of an appropriate AAC will ensure that the forest resource is being managed in a sustainable manner (VOIT 38). To this end, Millar Western will seek the Alberta government's approval of both the AAC and the process by which it was determined.

As a means of achieving sustainable forest management, non-timber values such as other commercial, recreational and spiritual activities must also be considered. To ensure that many perspectives were taken into account in the development of the DFMP, Millar Western prepared a *DFMP Development Communication Plan (Appendix II)*, which set out a strategy for involving stakeholders over the planning period, including open houses and the formation of Public Participation Group (VOIT 39). A summary of communication efforts and results is included in the *2007-2016 Stakeholder Communications Summary (Appendix III)*. To ensure that the same level of stakeholder engagement is maintained throughout the DFMP implementation period, the company has also developed the *2007-2016 DFMP Implementation Communication Plan (Appendix V)* (VOIT 44). Building on existing strategies, this plan calls for the creation of new consultation and communications tools, such as the development of a new public advisory group and virtual open house on its external website, to allow more stakeholders to view and provide input into its operational plans.

Cultural heritage values or artefacts represent another important non-timber value that must be considered in forest management (VOIT 40), as does forest aesthetics. Recognizing that the public generally appreciates established forests over recently harvested areas, particularly at significant viewpoints on travel corridors, Millar Western plans to complete an assessment and identification of areas with high aesthetic value within the DFA by November 30, 2008, so they can be set aside during harvesting operations (VOIT 41). This will be achieved through analysis of visual models and consultation with other DFA forestry operators and the public.

Millar Western will also contribute to enhancing public safety in the Whitecourt community by minimizing over the long term the area in the 'extreme' and 'high' fire-behaviour-potential classes in the Whitecourt FireSmart Community Zone (VOIT 42). This is intended to reduce the risk and severity of wildfire impacts on the town. Similar efforts will be made for the entire DFA (VOIT 43), in order to protect timber resources and other non-timber values.

In order to provide the desired benefits from the forest, timber productivity will need to be maintained or increased over the long term (VOIT 45).

CCFM Criterion 6: Accepting Society's Responsibility for Sustainable Development (VOITs 46-53):

Society's responsibility for sustainable forest management requires that fair, equitable, and effective forest management decisions are made. Accordingly, Millar Western has built a productive relationship with the Alexis Nakota Sioux Nation, with whom it signed a Forestry and Economic Development



Agreement (FEDA) in 2004 (for related commitments, see VOITs 47, 48). Working with the Alberta government, the company has identified other aboriginal communities whose traditional lands may also overlap with the DFA - the Lesser Slave Lake Regional Indian Council, the Sturgeon Lake Cree Nation and the Alexander First Nation - and has initiated contact with them. Millar Western recognizes and respects the traditional land-use areas of Alberta's aboriginal communities and values their input into its forest management activities and will continue to consult, at the community level, with designated representatives of aboriginal communities defined by the Alberta government (VOIT 46).

Millar Western will also maintain its involvement in the Environmental Co-Stewardship Committee (ECSC), created in 2004 under the FEDA, which formalized the ongoing efforts of Millar Western and the Alexis Nakota Sioux Nation to work together to ensure the responsible development of forest resources in areas where the two parties have usage rights and traditional ties (VOIT 48). Since its formation, the ECSC has proven an effective forum in which to raise and discuss land-use issues, as well as to pursue economic development opportunities.

General public participation is another component of sustainable development. Millar Western recognizes that it has an obligation to involve the public in its Sustainable Forest Management activities and, toward that end, has developed a comprehensive public participation plan (refer to *Appendix V - DFMP Implementation Communication Plan*) (VOIT 49). In addition to creating a virtual open house on its external website by July 31, 2008 (VOIT 51), Millar Western has also established a permanent Public Advisory Committee (PAC), which involves representatives of major stakeholder groups, and, under its term of reference, will meet a minimum of four (4) times annually (VOIT 52). The PAC will monitor VOITs, review operating plans, discuss issues relevant to sustainable forest management, and advise the company on communications with the broader public. Another target with respect to enhancing communications with the public is the establishment of a toll-free, 24-hour telephone hotline (VOIT 53). This tool will enable the public to voice comments, questions and concerns about sustainable forest management at a time convenient to them and without cost.

In addition to providing access to information about forest management plans, Millar Western also intends to promote a greater understanding of issues facing the forest industry and sustainable forest management by providing the public with an opportunity to visit a working forest. The Huestis Forest serves as a valuable venue for public education, where people can see, first-hand, native forest characteristics and the impacts and opportunities associated with managing forests for commercial uses, including forestry and energy development, and non-commercial values. To enhance the educational and demonstration value of the Huestis Forest, Millar Western will work with the Alberta government and other stakeholders to form a multi-stakeholder steering committee, which will guide the development and implementation of a management plan by December 31, 2008 (VOIT 50).

In addition to VOITs, which constitute obligations on the part of the company, Millar Western has identified 13 other commitments that it will strive to achieve over the course of the DFMP period. These include maintaining the DFA Silviculture and Harvest Planning Committees as a way to ensure that all operators on the DFA adhere to the DFMP's strategic direction; developing forest regeneration strategies to mitigate insect infestations and disease; and investigating new technologies for improving forest and vegetation inventories. To make them more clear and accessible, both for regulatory and implementation purposes, all company obligations, including VOITs and company commitments, have been consolidated in *Appendix XXIII*. Only items found in this location are to be construed as company obligations.

TSA and SHS

Millar Western's strategic forest management plan is reflected in the PFMS, which is the basis for the company's timber allocation (TSA) and the location and timing of its harvesting operations (SHS). The following table indicates how much timber the company plans to harvest over the next 10 years, while the two maps indicate where Millar Western will concentrate its harvesting activities over the timeframes 2007-2016, and 2017-2026.



Table 1. Proposed harvest allocation for 2007-2016 from the Preferred Forest Management Scenarios.

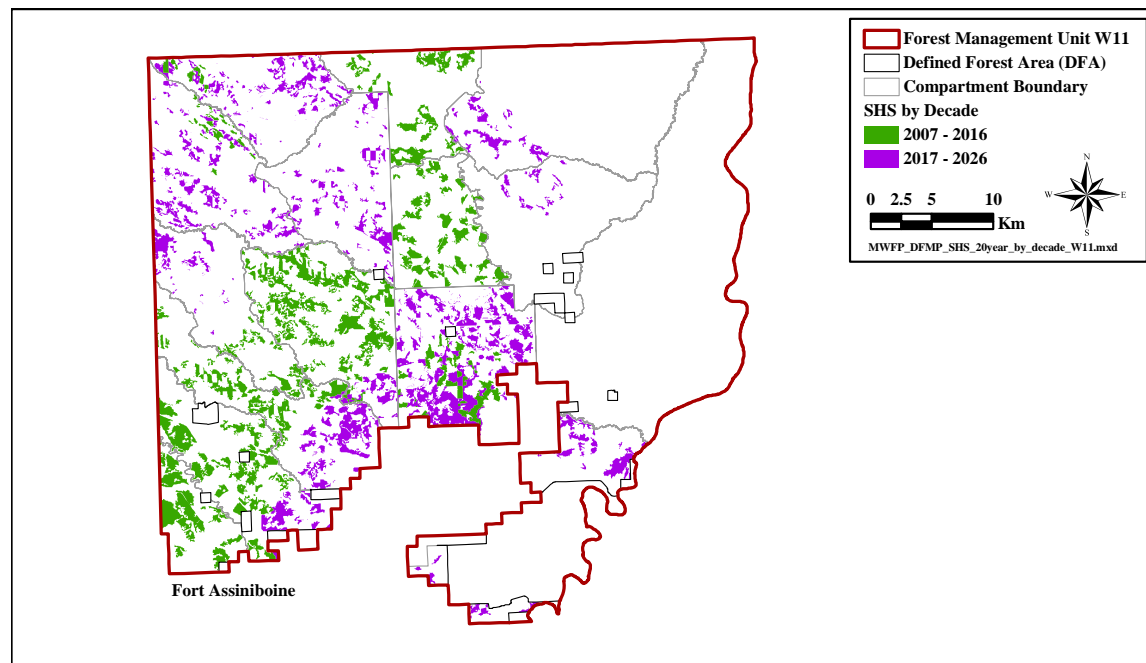
Company Name	Disposition Number / FMA Ref.	FMA/ FMU/ Grazing	Deciduous AAC (%)	Deciduous AAC (m3/yr)	Incidental Deciduous (%)	Incidental Deciduous (m3/yr)	Coniferous AAC (%)	Coniferous AAC (m3/yr)
W13								
MTU	[8(2)(e)(i)]	FMA						30,000
MTU*	[8(2)(e)(ii)]	FMA			100	861		
Weyerhaeuser	DTAW130001	FMU		45,000				
MWFP (QUOTA)	CTQW130002	FMU					4.42	19,264
MWFP (FMA)	FMA970034	FMA		157,099				376,925
MWFP	CTQW130001	Grazing					100.00	9,655
MWFP (Requested)**		Grazing	100.00	6,452				
Sub Total				208,551		861		
Total				209,412				435,844
W11								
MWFP	FMA970034	FMA		103,520				
OK Lumber	CTQ110005	FMU					21.05	19,975
Fort Assiniboine Lumber	CTQ110004	FMU					6.26	5,940
Spruceland Millworks Inc.	CTQ110006	FMU					72.70	68,987
MWFP (Requested)**		Grazing	100.00	2,529				
Total				106,049				94,903
FMA								
Area Residents	[8(2)(d)]	IN				1000***		

* within Whitecourt and Blue Ridge subunits

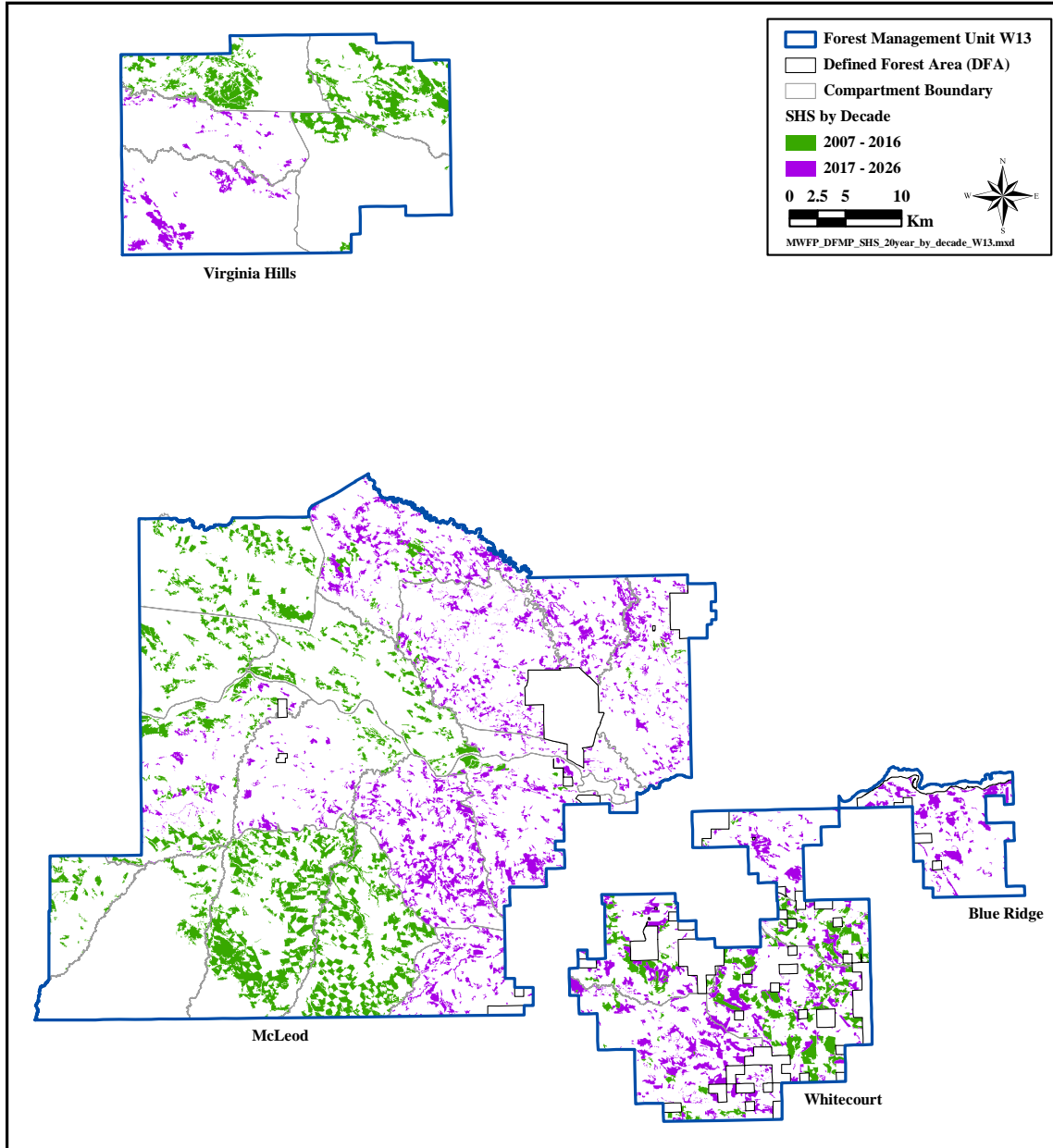
** July 18, 2006 letter to D.A. Sklar, re: DTA's for unallocated deciduous volume

*** conifer/deciduous(birch) Not accounted in calculations

Represent basis for calculations



Map 1. W11 Preferred Forest Management Scenario Spatial Harvest Sequence.



Map 2. W13 Spatial Harvest Sequence.

Implementation

Millar Western has invested significant time and effort in improving the linkages between planning and operational areas, to ensure that plans better reflect operational realities and that operations staff are more aware of planning requirements. DFMP implementation is further achieved through the following mechanisms:

- General Development Plan (GDP) - developed annually by each operator for a period spanning five years, these plans generally describe the location and amount of harvesting, regeneration and road construction and maintenance.



- Annual Operating Plan (AOP) - developed annually by each operator and submitted to the Alberta government for approval, these plans describe in detail the activities that will be undertaken during the year, including access, harvesting and silviculture activities. AOPs are further broken down into a final harvest plan, detailed road designs, regeneration plans, growth-and-yield plans, road management agreements with other industries, communications.
- Operating Ground Rules (OGR) - negotiated with the Alberta government, the OGRs describe how Millar Western will conduct its forest management activities in a way that will minimize its environmental footprint and include stand-structure retention objectives and protocols for the establishment of buffers to protect water quality and riparian habitats.

Emerging Issues

In addition to IAGs, Millar Western also established a number of Landscape Projection Groups (LPGs), to identify, for the purposes of discussion, emerging issues that have the potential to greatly influence the landbase but which are not within the scope of the current Alberta planning standard: climate change, human population dynamics, wildfire and oil and gas development. The findings of these LPGs, included in the appendices, confirm that these issues are indeed significant and likely to have a major bearing on future sustainability of the forest. The challenge for governments, forest companies and other stakeholders is to try to understand their implications at an early stage and develop policies and management strategies that are anticipatory rather than reactive. Millar Western is committed to continuing to monitor these issues, both to make informed contributions to policy discussions and to ensure its own management plans reflect developments on all fronts - economic, ecological and social.

Conclusion

With the finalization of the 2007-2016 DFMP, the company's attention will turn to completing the 2002-2006 Stewardship Report, due in the fall of 2008. This report, the first for the expanded FMA, will summarize the company's performance with respect to achieve the W13 targets during the last five years of the 1997-2006 DFMP and the W11 targets, as set out in the 2004 PFMP. Future stewardship reports will be produced every five years and will be based on the DFMP in effect at the time.

This plan, submitted to the Alberta government in November 2007, represents the company's strategy for sustainable forest management of its FMA area and was developed in consideration of over 50 objectives. Though it reflects the probability of significant impacts due to the mountain pine beetle infestation, the actual behaviour of the mountain pine beetle remains a significant variable, one that will need to be monitored closely over the course of the next 10 years and which may require refinements to the AAC. Millar Western is committed to working with the Alberta government and other stakeholders, including other forestry companies operating on its landbase and the public, to ensure that its strategies reflect current realities. To that end, it remains committed to consultation and research as a means of ensuring that its strategies remain proactive rather than reactive, and that it remains on the leading edge of forest management within Alberta.

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