

APPENDIX 1 – GOALS, OBJECTIVES AND STRATEGIES MATRIX

Criteria	Element	Goal	Objective	Strategy
Conservation of Biological Diversity				
	Ecosystem Diversity			
		Maintain relative proportions of existing broad cover groups.		
			Maintain the same proportions of broad cover groups (as defined in the Net Landbase and Yield Curve Development Documents) on the productive landbase as stated in Forest Management Branch Directive 2004-01.	
				Balance the proportion of harvested broad cover group to within 5% (or 10 hectares, whichever is greater) of the pre-harvest broad cover groups on a five-year period. This balance will be complete as per provincial forest policy.
				Stands with a sufficient conifer understory will transition as per the Understory Stand Transition Strategy (Appendix 2).
		Reduce the level of fragmentation in the FMA		
			Develop a long-term operational harvest plan for the FMA.	

Criteria	Element	Goal	Objective	Strategy
				Develop a 10-year operational harvest sequence, with an associated 10-year contingency sequence within the FMA is to be submitted with the DFMP.
				Utilize a single pass harvest system that allows the harvest of complete stands in as short a time frame as possible.
				Both conifer and deciduous will be harvested in each stand at the same time, while maintaining retention and understory protection requirements.
			Minimize the amount of new clearing required for access within the FMA.	
				Develop and submit a Road Corridor Development Plan (Appendix 3) as part of the Preferred Forest Management Strategy. This plan is to be used to determine access locations until the Access Management Plan is approved.
				Develop a 10-year Access Management Plan for the FMA by July 1, 2005. Provisions for amendments to this plan will be made in order to continually integrate the access management plan with access developed by other users.

Criteria	Element	Goal	Objective	Strategy
				Integrate planning and operations with utility disposition holders to reduce hazard trees along powerlines while minimizing the loss to the forest landbase. This is to be accomplished through the following process:
				Provide a copy of the operational harvest sequence, the Road Corridor Development Plan and the 10-year Access Management Plan for the FMA to the local SRD office and other known commercial users on the FMA. Enclose a letter with these documents encouraging them to practice integrated landscape management. Other known commercial users to be determined through LSAS search.
			Reduce the area of anthropogenically created disturbances on the net productive area.	
				Reforest seismic lines that are within harvested areas, excluding seismic lines being used to meet other management objectives (ie. Recreation, access), at the time the rest of the block is reforested.
				Vanderwell will create an Integrated Reforestation Strategy (Appendix 4) that strives to reforest to silviculturally and commercially acceptable tree species, all dispositions as they are added back into the productive landbase.

Criteria	Element	Goal	Objective	Strategy
		Maintain habitat features that may otherwise become limited through the implementation of forest management strategies detailed in this plan.		
			Maintain habitat features that may otherwise become limited through the implementation of forest management strategies detailed in this plan.	
				Ensure the amount of over mature stands is maintained over the next 20 years.
				Define the amount of structure left across the landscape
				Maintain 3% of net productive area as stand structure that will eventually contribute to coarse woody debris within a harvest block.
				In blocks where 'pile and burn' is the slash disposal prescription, up to 10% of the piles, or one pile per block, whichever is greater, can be retained on site.

Criteria	Element	Goal	Objective	Strategy
	Species Diversity			
		Ensure special management considerations are in place for known threatened, endangered, rare or vulnerable species.		
			Develop management strategies that strive to protect the Woodland Caribou and its habitat.	
				At the operational level, adopt the applicable best operations practices as defined by the Boreal Caribou Committee for operations within the caribou zone (Appendix 5). This is to be completed through the development and implementation of an Annual Caribou Protection Plan.
				Utilize reclamation techniques on access routes that strive to prevent highway vehicle use and limit off-highway vehicle use (as per the Alberta Timber Harvest Planning and Operating Ground Rules and the Resource Road Planning Guidelines).
				Implement silviculture systems that will limit the non-coniferous shrub and tree regeneration phase of succession in conifer dominated stands.

Criteria	Element	Goal	Objective	Strategy
				Carry out harvest activities in winter months except where existing access and ground conditions permit harvest activities to occur otherwise.
				Vanderwell will create an Integrated Reforestation Strategy (Appendix 4) that strives to reforest to silviculturally and commercially acceptable tree species, all dispositions as they are added back into the productive landbase.
				Evaluate the FMA to determine the amount of effective habitat available for caribou.
				Target harvest activities in stands that are North of the 2001 Chisholm Fire.
				Utilize a single pass harvest system that allows the harvest of complete stands in as short a time frame as possible.
				Concentrate harvest activities in stands of lower habitat quality to the Woodlands Caribou. Pine stands have been identified as being the highest quality habitat types for Woodland Caribou, deciduous stands are the lowest.
				Target harvest into stands that can have lower impact harvest strategies (understory protection) implemented on them.
				In development of the Road Corridor Development Plan and the Access Management Plan strive to have new access follow existing linear disturbances.

Criteria	Element	Goal	Objective	Strategy
		Reduce the impacts of noxious and restricted weeds on naturally occurring species		
			Monitor and control the spread of noxious and restricted weeds on Vanderwell Dispositions.	
				Adhere to the Weed Control Act.
				Train appropriate woodlands staff to identify noxious and restricted weeds.
		Maintain vegetative structure within the FMA in varying spatial patterns.		
			Evaluate the amount of and maintain structure across the landscape of the FMA.	
				Define the amount of structure left across the landscape
				Natural areas (Hondo and Saulteaux) within the FMA are to be retained as landscape structure.
				Buffers as defined in the Alberta Timber Harvest Planning and Operating Ground Rules are to be retained as landscape structure.
			Maintain structure at the stand level within the FMA.	
				Maintain 3% of the net productive area available for harvest as structure within cutblocks.

Criteria	Element	Goal	Objective	Strategy
	Protected areas and areas of special biological significance.			
		Maintain functionality of protected areas.		
			Ensure forest management operations do not occur within the boundaries of the Hondo and Saulteaux Natural Areas.	
				The Hondo and Saulteaux Natural Areas have been removed from the net landbase and therefore are not available for harvest. The access management plan shall ensure future access is not planned within these areas.
		Protect areas of special biological significance.		
			Ensure forest management operations protect areas of special biological significance.	
				Implement Vanderwells Areas of Special Biological Significance Protection Strategy (Appendix 7).
Ecosystem Condition and Productivity				
	Ecosystem Resilience			

Criteria	Element	Goal	Objective	Strategy
		Maintain regenerative capacity and a balanced distribution of forest types within the FMA		
			Meet, or exceed, government regulated regeneration standards.	
				Create strata specific regeneration standards for the FMA prior to December 30, 2006.
				Follow current government regeneration standards until such time as FMA specific standards are developed.
				Develop and implement a Silviculture Strategy Summary (Appendix 8) to be included in the Detailed Forest Management Plan.
				Conduct pre-harvest assessments to determine most effective harvesting and reforestation strategy on cutblocks as per Vanderwell's Pre-Harvest Assessment Procedures (Appendix 9).
				Implement initial reforestation treatment within 2-years of harvest except where required to achieve another strategy.
				Conduct plantation monitoring surveys within 3 years of initial reforestation treatment date to assess level of establishment and identify limiting factors.
				Conduct regeneration surveys as required by provincial legislation.

Criteria	Element	Goal	Objective	Strategy
			In reforestation activities, utilize trees that most closely resemble the natural gene pool.	
				Utilize natural regeneration methods where appropriate.
				Reforest areas using seedlings grown from seed collected in the same seed zone, and according to the provincial seed zone guidelines.
				Stands with a sufficient conifer understory will have understory protection measures implemented so as to ensure 70% of the pre-harvest density of coniferous understory is maintained post harvest. A description of the Understory Protection harvest strategy to be implemented in these stands is included in Appendix 10.
			Maintain the same proportions of broad cover groups (as defined in the Net Landbase and Yield Curve Development Documents) on the productive landbase within 5% of current status over a 5-year period.	
				Balance the proportion of harvested broad cover group to within 5% of the pre-harvest broad cover groups on a five-year period. This balance will be complete as per provincial forest policy.
				Stands with a sufficient conifer understory will transition as per approved Understory Stand Transition Strategy (Appendix 2).
		Maintain a Healthy Forest		

Criteria	Element	Goal	Objective	Strategy
			Monitor and detect the location of insect and disease infestations within the FMA.	
				Review the annual report produced by SRD detailing the status and location of insect and disease infestations within the province of Alberta.
				Implement Vanderwell's Insect and Disease Policy and Procedure (Appendix 11) within the FMA.
				Maintain active membership in the Northeast Boreal Integrated Pest Management Working Group.
			Ensure that merchantable volume loss resulting from insect and disease infestations is minimized.	
				Implement the Dwarf Mistletoe Management Plan (Appendix 12).
				Harvest stands threatened/infected by insect/disease infestations prior to the harvest of stands that have little to no forest health issues.
Soil and Water Conservation				
	Physical Environmental factors			
		Mitigate the impacts of forest management activities on the quality and quantity of soil and water.		

Criteria	Element	Goal	Objective	Strategy
			Implement operational procedures that strive to mitigate the impact on the quality and quantity of soil and water resources.	
				Conduct Pre-Harvest Assessments to identify sites with access and harvest limitations due to soil conditions.
				If cutblocks contain soils and conditions susceptible to excessive rutting, operations will avoid these areas until conditions improve.
				Minimize the amount of blocks with greater than 5% of the block area taken up in roads (as measured in the Forest Soils Conservation Guidelines). In blocks with greater than 5% of the area in roads, reasoning for this must be provided in the Final Harvest Plan.
				All road construction and watercourse crossing structures will be installed and reclaimed in accordance with provincial and federal legislation.
				Reclaim and reforest areas within cutblocks that have been used for roads as per the Alberta Timber Harvest Planning and Operating Ground Rules.
				Vanderwell will adhere to the Standards & Guidelines for Operating Beside Watercourses of the Alberta Timber Harvest Planning and Operating Ground Rules.

Criteria	Element	Goal	Objective	Strategy
			Ensure crossing structures are installed, maintained and reclaimed in a manner that allows them to function properly over time. This includes the passage of water, and where applicable, fish. Ensure roads are constructed, maintained and reclaimed in a manner that minimizes erosion and road surface degradation.	
				Crossings will be assessed as per the Vanderwell Stream Crossing Assessment Policy and Procedure (Appendix 13). Database to be created to track the location, LOC/Disposition #, crossing number, crossing class (temp or perm), crossing type (bridge, culvert, etc.), creek class, installation date, inspection date, crossing category (red, green, blue, yellow).
				Assess crossing structures as they are installed, and monitor on a weekly basis according to Field Operations Reporting Protocol.
				Monitor roads as per the Vanderwell Road Monitoring Policy and Procedure (Appendix 14).

Criteria	Element	Goal	Objective	Strategy
			Training and information is provided to those individuals in charge of planning and supervising the construction, maintenance and reclamation of roads and watercourse crossings.	
				Provide training thru the Woodland Operations Learning Foundation (Watercourse Crossing) to appropriate employees on how to properly construct and install creek crossings.
				Ensure appropriate employees have access to the Forest Soils Conservation Guidelines, the Resource Road Planning Guidelines, the Stream Crossing Guidelines, and the Operating Ground Rules.
				Provide training to logging and site preparation contractors describing how to minimize soil and water disturbance.
Global Ecological Cycles				
	Forest Land Conversion			
		Enhance the area classified as 'treed' within the FMA.		
			Minimize the area within the FMA being converted from the 'treed' productivity class to 'anthropogenic non-forested'.	

Criteria	Element	Goal	Objective	Strategy
				Develop a 10-year Access Management Plan for the FMA by July 1, 2005. Provisions for amendments to this plan will be made in order to continually integrate the access management plan with access developed by other users.
				Provide a copy of the operational harvest sequence, the Road Corridor Development Plan and the 10-year Access Management Plan for the FMA to the local SRD office and other known commercial users on the FMA. Enclose a letter with these documents encouraging them to practice integrated landscape management. Other known commercial users to be determined through LSAS search.
			Reforest anthropogenic non-forested sites.	
				Reforest seismic lines that are within harvested areas, excluding seismic lines being used to meet other management objectives (ie. Recreation, access), at the time the rest of the block is reforested.
				Vanderwell will create an Integrated Reforestation Strategy (Appendix 4) that strives to reforest to silviculturally and commercially acceptable tree species, all dispositions as they are added back into the productive landbase.
Multiple Benefits				
	Timber and Non-Timber Benefits			

Criteria	Element	Goal	Objective	Strategy
		Ensure the ability of the forest landbase to provide a flow of benefits to society.		
			Maintain or enhance the sustainable harvest levels.	
				Calculate a sustainable harvest level for the FMA.
				Ensure timber is utilized to the 15/11 utilization standard.
				Update the current inventory prior to developing the next Detailed Forest Management Plan. The re-inventory program will be used to assess changes in land-use and forest classifications, an understory inventory will also be created, and areas currently classified as potentially productive will be re-evaluated.
			Ensure forests are not harvested at a rate greater than what is sustainable.	
				Develop a spatially explicit annual allowable cut that ensures the sustainability of the fibre source for a minimum of 200 years.
				Monitor the harvest level on a five-year basis to ensure the harvest level does not exceed the sustainable annual allowable cut level.
				If a natural disaster (insect, disease, wind, fire) results in a harvest level greater than what is deemed sustainable, and impacts greater than 2% of net productive area within one timber year, the annual allowable cut will be re-calculated.

Criteria	Element	Goal	Objective	Strategy
				Develop a long-term growth and yield monitoring program for the FMA by March 1, 2006.
			In conjunction with the Department of Sustainable Resource Development, strive to minimize the impact of wind and fire events within the FMA.	
				Maintain communication with the Department of Sustainable Resource Development throughout the fire season to ensure all fires within the FMA are reported to Vanderwell Contractors.
				When working in the FMA, Vanderwell woodlands staff will monitor for fires and areas impacted by blowdown.
				Develop a Fire Control Plan on an annual basis.
				As part of the Preferred Forest Management Strategy, develop a map that identifies Vanderwell Contractors values at risk within the FMA. This map is to be provided to the Forest Protection Division in Slave Lake.
				In conjunction with the Forest Protection Division, identify areas with water source requirements in the FMA. Where required, integrate the creation of water sources with other operations.
			Ensure that merchantable volume loss resulting from wind and fire events is minimized.	
				Deviate from the approved spatial sequence in order to harvest stands impacted by wind and fire events.

Criteria	Element	Goal	Objective	Strategy
			Mitigate the impact of forest management activities on recreational opportunities.	
				Create a map showing the location of current recreational sites and trails by September 30, 2005.
				Work with stakeholders to mitigate the impacts of forestry operations on recreational sites and trails.
			Mitigate the impact of forest management activities on scenic values.	
				Create a map showing the location of areas where scenic values should be considered in the development of Final Harvest Plans, this map is included in the Landscape Assessment portion of this document.
				Implement strategies as defined in the Management of Visually Sensitive Areas document (Appendix 15).
			Protect historical/unique values during forest management operations.	
				Implement Vanderwell's Historical and Unique Resource Reporting and Protection Policy and Procedure (Appendix 16).
				Prior to September 30, 2005, conduct an evaluation of the FMA to identify sites of potential historical value.
				Prior to September 30, 2005, develop operational strategies on how to protect areas with historical and/or unique resources.

Criteria	Element	Goal	Objective	Strategy
			Mitigate the impact of forest management activities on Registered Trappers.	
				Calculate the current amount of area within each trapline that is over the age of 40 and the predicted amount 20 years in the future. A summary of these calculations is provided in the Preferred Forest Management Strategy (Section 8.0).
				Provide opportunities for Registered Trappers to have input into the development of Operating Plans by implementing Vanderwell's Registered Trappers Notification Policy and Procedure (Appendix 17).
	Competitiveness			
		Maintain a environment that allows the forest industry to remain competitive in provincial, national and international markets.		
			Produce a spatially explicit plan that allows the forest industry to prepare for future expenses.	
				Develop a 10-year operational harvest sequence, with an associated 10-year contingency sequence within the FMA to be submitted with the DFMP.

Criteria	Element	Goal	Objective	Strategy
				Develop a 10-year Access Management Plan for the FMA by July 1, 2005. Provisions for amendments to this plan will be made in order to continually integrate the Access Management Plan with access developed by other users.
			Allow flexibility in the timing of harvest within the FMA.	
				Allow the forest industry flexibility to post pone harvest in one cut-control period, until the next cut-control period. This would allow the harvest in the next cut-control period to be equal to the allowable cut for that period, plus any un-used harvest from the previous cut-control period.
			Adopt the planning process as defined in the Alberta Timber Harvest Planning and Operating Ground Rules and Framework for Renewal.	
				Include an implementation strategy in the Detailed Forest Management Plan that is consistent with the Alberta Timber Harvest Planning and Operating Ground Rules and Framework for Renewal.
			Support research and innovation into sustainable forest management.	
				Identify areas where increased knowledge is required in order to reduce the uncertainty that results from assumptions made in the strategies being implemented as per this Detailed Forest Management Plan.

Criteria	Element	Goal	Objective	Strategy
				Develop a schedule detailing how and when knowledge gaps identified in Strategy 14.4.1 are to be filled.
				Implement research to fill knowledge gaps as defined in the schedule produced in Strategy 14.4.2.
			Practice adaptive management and continually improvement forest management activities.	
				Develop and implement a Performance Monitoring, Analysis and Reporting Plan (Section 9.0) as part of the Preferred Forest Management Strategy to track whether the forest management goals are being met, and identify areas for improvement. This plan is to also describe how continual improvement is going to be achieved.
Society's Responsibility				
	Fair and effective decision making			
		Create an environment where those interested in contributing to forest management decision making have the ability to contribute.		

Criteria	Element	Goal	Objective	Strategy
			Develop and Implement a comprehensive Public Involvement Plan that allows public members a voice at the decision making table.	
				As part of the Detailed Forest Management Planning process, develop and implement, with public participation, a government approved Public Involvement Plan (Section 10.0) for the FMA.
				In order to ensure applicability, review the Public Involvement plan on an annual basis. This review will include members of the public.
	Informed Decision Making			
		To have an informed public that can provide input in the forest management decision making process.		
			Develop and implement a comprehensive Public Involvement Plan that promotes public education regarding sustainable forest management.	
				As part of the Detailed Forest Management Planning process, develop and implement, with public participation, a government approved Public Involvement Plan (Section 10.0) for the FMA.

				In order to ensure applicability, review the Public Involvement plan on an annual basis. This review will include members of the public.
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APPENDIX 2 – STANDS WITH UNDERSTORY TRANSITION STRATEGY

Introduction

There are 901 hectares of mixedwood and deciduous stratum stands with identified conifer understories in the Vanderwell FMA. This represents roughly 18% of the net productive landbase within the FMA. The natural successional pathways of these stands would have them progress from a deciduous overstory to a mixedwood, and perhaps a conifer dominated stand over time.

Members of the Planning Team have expressed their desire to see the conifer understory in these stands protected during harvest activities. This harvest strategy will help achieve many of the objectives of forest management within the FMA such as, maintenance of habitat features, protection of Woodland Caribou and its habitat, maintenance of stand structure and to utilize the natural gene pool in reforestation activities.

If the coniferous understory within these stands is to be protected, the timber supply analysis must follow rules on how to transition these stands post harvest. Once harvested, most stands are assumed to regenerate to the pre-harvest stand type with an age of zero. In the case of a stand with a deciduous overstory and a coniferous understory, these stands will not regenerate to a deciduous stand post harvest, and will not have the characteristics of a zero aged stand.

This document is intended to explain what stand type and age these conifer understory stands will transition to, why that decision was made, and the assumptions made in coming to this decision.

Background Information

Vanderwell created a summary and map of all conifer understories within both Deciduous and Mixedwood stands in the Vanderwell FMA. The area in hectares was summarized by four factors, (1) understory crown closure, (2) understory leading species, (3) understory height, and (4) understory age. The summaries and map are included in the Landscape Assessment document (section 5.0 of this document).

On April 8, 2004 Vanderwell staff conducted a low-level flight over the Vanderwell FMA to identify stands with conifer understories. The notes from this flight have been compared to the understory summary and map. Through this comparison it was found that the majority of stands identified on the flight are identified in the inventory, and the majority of the stands identified in the inventory were identified on the flight.

Vanderwell staff are comfortable that stands with understories have been identified in the inventory, but sense the detail contained in the inventory was misinterpreted. Vanderwell feels that the crown closure is underestimated, the height overestimated, and the age overestimated.

This sense has been attained twice. The first time the specific inventory calls were looked at was after field plots were installed in one stand within the FMA with an identified understory. The inventory

has classified the stand as having an understory crown closure of 'A', an understory height estimate of 18 meters and an understory age of 74 years.

Based on the plot data collected by Vanderwell, an average density of 781 stems/ha was found with an average height of 6.2 meters. Using the Subregion-based compatible height and site index models for young and mature stands in Alberta: revisions and summaries (Part II) it was determined, using Table 3: Provincial white spruce height and site index prediction table, and assuming a site index of 16, a 6.2 meter tall white spruce tree has a breast height age of 19 years. (The data was collected in a 49-hectare stand, having 49 plots of 5.64-meter radius installed on a 100 * 100 meter grid.)

The second time the inventory information was looked at was during the flight taken by Vanderwell staff on April 8, 2004. Vanderwell staff found a similar trend during this low level flight of the FMA.

Vanderwell feels the inventory accurately identifies stands containing conifer understories, however as the interpretation was conducted using 'leaf-on' medium scale black and white photography, it is not felt the attributes of the understory stands were easily assessed.

Proposed Understory Transition Strategy

The intent of this proposed strategy is to determine what yield curve the understory protected stand should track, and at what age the stand should be assigned immediately post harvest.

Realizing that the details contained in the Alberta Vegetative Inventory for the Vanderwell FMA regarding the understory characteristics seem questionable, and in keeping with the philosophies of Ecological Sustainability, the Precautionary Principle, Adaptive Management, Accountability and Decision Making identified in the Vanderwell Terms of Reference document, Vanderwell proposes the following transition strategy for stands treated with understory protection harvesting strategies.

<i>Stands with Conifer Understory Transition Strategy</i>							
Overstory Species Group (inventory)	Understory Crown Closure (inventory)	Understory Leading Species (inventory)	Understory Height (inventory)	Understory Age (inventory)	Post-Harvest Stand Type	Post-Harvest Stand Age	
D	A	Sb	1-5	All	MX	7	
		Sw	6-10 m	All	MX	26	
			11-15 m	All	MX	26	
		B	Sw	6-10 m	All	MX	26
				11-15 m	All	MX	26
				16 m +	All	MX	26
		C	Sw	11-15 m	All	MX	26
				16 m +	All	MX	26
MX	A	Sw	1-5 m	All	MX	7	
			6-10 m	All	MX	26	
			11-15 m	All	MX	26	
		B	Sw	6-10 m	All	MX	26
				11-15 m	All	MX	26
				16 m +	All	MX	26
		C	Sb	6-10 m	All	MX	26
				11-15 m	All	MX	26
			Sw	6-10 m	All	MX	26
			16 m +	All	MX	26	

Considering the densities seemed underestimated in the inventory, yet knowing a cautious approach was required, Vanderwell proposes all understory protected stands transition to the mixedwood stand type.

The ages for the 1-5 meter tall understories were determined using the assumption that these stands had an average height of 1.3 meters, and that the time it takes for a tree species to reach 1.3 meters is 7-years.

The ages for all other understory height classifications was determined assuming an average height of 6-meters. Using the Subregion-based compatible height and site index models for young and mature stands in Alberta: revision and summaries (Part II), it was determined that white spruce takes 19 years (breast height age) to reach 6-meters in height, it was assumed that it takes 7-years to reach breast height.

Acceptable Variance

As per provincial policy, a maximum of 5% of the stands can transition to a stand type other than what is approved in the DFMP.

Implementation Schedule

Stands will have understory protection harvest strategies implemented on them as scheduled in the Timber Supply Analysis and the Spatial Harvest Sequence. The transition strategy was used in the Annual Allowable Cut determination process.

Monitoring Procedure

Though a cautious approach was taken, Vanderwell understands and acknowledges that an information gap exists with regards to determining how conifer understory stands should transition post harvest. In order to mitigate the risks of the assumptions built into the proposed strategy Vanderwell commits to ensuring our growth and yield program addresses this identified information gap, and the information learned from the growth and yield program is used in future management plans to temper the assumptions.