Comparison of Environmental Effects of the 10-Year and 20-Year Forest Management Plans

Report to:
Louisiana Pacific Canada Ltd.

0446-A-13
August 2006

TetrES CONSULTANTS INC.
Solutions for a Sustainable Environment

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Mr. Barry Waito
Manager, Woodland Operations
Louisiana-Pacific Canada Limited
439 Westwood Road (P.O. Box 998)
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Dear Mr. Waito

RE: COMPARISON OF ENVIRONMENTAL EFFECTS OF THE 10-YEAR & 20-YEAR FOREST MANAGEMENT PLAN (FMP)

In March 2006, you provided Tetr*ES* Consultants Inc. (Tetr*ES*) with the direction to compare Louisiana Pacific Canada's (LPC) 10-Year and 20-Year Forest Management Plans (FMPs). The intent was to provide LPC with an independent analysis of the differences between the 10- and 20-year plans towards determining whether it would be appropriate to submit to the Manitoba Conservation Director of Approvals a Notice of Alteration for the 20-Year FMP.

The attached document and associated tables form the body of the report describing the findings of our comparison between LPC's 10-Year and 20-Year FMPs. The report describes the process by which Tetr*ES* has evaluated the 20-Year FMP as well as the results of the evaluation. Descriptions and examples of ratings given to each of the 160 factors evaluated are provided in Tables 1 and 2 of the report.

We appreciate your review and comment on the attached report and associated tables.

Yours truly

Tetr*ES* Consultants Inc.

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of the 10-Year & 20-Year Forest Management Plan

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Louisiana Pacific Canada Ltd.

0446-A-13-00

August 2006

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1.0 INTRODUCTION

Louisiana-Pacific Canada (LP) proposes to implement a 20-Year Forest Management Plan (FMP) for the Forest Management Licence Area #3 Agreement (FMLA#3) as submitted to the Department of Forestry on June 1, 2006. This plan builds on and expands the 10-Year FMP issued to Manitoba Conservation in 1994 and later implemented by LP. LP's forestry activities in the FMLA#3 area, as described in the 1999 10-Year FMP and assessed in the Environmental Impact Assessment (EIS) prepared by Tetr*ES* (2005), are currently licenced under the Manitoba *Environment Act* Licence No. 2191, issued on December 11, 1996, which initially expired at the end of 2006 but has been extended and now will expire in June 2007.

In March 2006, LP provided Tetr*ES* with a copy of the 20-Year Sustainable Forest Management Plan and asked that we compare this document with the 1996 submissions. An evaluation of the potential changes in the environmental effects of the proposed 20-Year FMP are specified in this report and Tables 1 and 2.

The following facts are relevant to this evaluation:

- LP continues to operate in the FMLA#3, as per the terms and conditions of the Agreement, which came into effect on September 21, 1994 and expires on December 31, 2014.
- LP remains in compliance with the terms of Licence No. 2191 as confirmed by the Tetr*ES* 2004 Performance Evaluation.
- The 20-Year FMP covers the geographic area of FMLA #3, which includes Forest Management Units (FMU) 10, 11 and 13. LP may also conduct harvest activities in FMUs 12 and 14, which are currently administered by the Mountain Quota Holders Association. There have not been any changes in the geographic area of FMLA#3 since issuance of the 10-Year FMP.
- The plan was developed in accordance with the draft Manitoba document, "*10-Year Forest Management Plan Submission Guidelines*" (Manitoba Conservation 1999); there were no 20-year FMP submission guidelines at the time the plan was written.

Tetr*ES*' evaluation of the proposed 20-Year FMP reveals that it is essentially a continuation of the 10-Year FMP that received regulatory approval in 1996. The 20-Year FMP incorporates new environmental protection activities and practices, including new procedures for continued public involvement. Many of these new practices have been implemented as a result of continuing research and monitoring activities conducted during the implementation period spanning the 10-Year FMP.

2.0 DETERMINATION OF CHANGES IN ENVIRONMENTAL EFFECTS

An Environmental Impact Statement (EIS) of the 10-Year FMP was submitted for regulatory review in 1995 (Tetr*ES* 1995). The 10-Year FMP underwent considerable and extensive public and government scrutiny, including a Clean Environment Commission (CEC) process. Considering that the basis of the 20-Year FMP is essentially a continuation of the 10-Year FMP, the environmental impact assessment and conclusions of the 1994 EIS were evaluated and compared with the 20-Year FMP. In reaching a determination of the type of change, if any, that has occurred in the format provided by the 10-Year FMP Submission Guidelines (Manitoba Conservation 1999).

The expected changes in environmental effects between the 10- and 20-Year FMPs were rated according to the following criteria:

- **Positive**, which may occur as a result of a:
  - Negative effect associated with the 10-Year FMP that is expected to be reduced in the 20-Year FMP.
  - Positive effect that is expected to increase.
  - New positive effect that is expected to occur with implementation of the 20-Year FMP.
- **Neutral or Neutral-Positive**:
  - No change in effect from the 10-Year FMP is expected to occur with implementation of the 20-Year FMP. If the evaluation found a potential for a positive effect this uncertainty is acknowledged with a neutral-positive category.
- **Negative**, which may occur as a result of a:
  - Negative effect associated with the 10-Year FMP that is expected to increase with implementation of the 20-Year FMP.
  - Positive effect that is expected to be reduced.
  - New negative effect that is expected to occur with implementation of the 20-Year FMP.

- **Uncertain**:
  - It cannot be determined with measurable certainty nor is immediately obvious if a change in effect associated with implementation of the 20-Year FMP is positive, neutral or negative.
- **"NA"**:
  - These were listed in the Provincial Guidelines in a particular section, but addressed elsewhere in the 20-Year FMP. These were noted as "NA" and are accompanied by notes re-directing the reader to further discussion in the table.

3.0 COMPARATIVE EVALUATION OF 10-YEAR AND 20-YEAR FMPs

The current assessment used the provincial FMP Guidelines in conducting a comparative evaluation of the changes in 160 environmental factors between the 10- and 20-Year FMPs. Of the factors outlined in the 20-Year FMP, 43% were assessed to be Positive changes, as compared to the 10-Year FMP, 38% were Neutral, 10% were Neutral-Positive, 0.6% remained Uncertain, and 0.6% were Negative (Table 1).

While the format structure of the 10- and 20-Year FMPs is sometimes different from the provincial guidelines, the two documents are very similar in content and scope. Table 2 provides more detail on the comparative evaluation of the objectives, strategies, activities, and procedures stated in the 10- and 20-Year FMPs, and identifies expected changes in environmental effects as a result of these changes.

3.1 POSITIVE: REDUCTIONS IN ADVERSE EFFECTS AND UNCERTAINTY

The effect of many of the activities stated in the 20-Year FMP are rated as “positive” because they have resulted in a reduced potential for environmental effects. While the overall effect may still be negative in nature for some factors (e.g., ongoing reduction in habitat for some wildlife), research and monitoring programs implemented in the 20-Year FMP have led to adaptive management improvements in sustainable forest management practices and thereby have reduced residual effects of forest harvest activities by LP. There were also 25 potential environmental effects associated with the 10-Year FMP that could not receive an assessment judgment as to the magnitude or type of change due to the associated uncertainties. Many of these uncertainties have been resolved through research, monitoring, and other activities that have occurred during the 10-Year implementation period of the 1996 FMP. In these cases where uncertainty has been resolved, the resulting evaluation of changes in environmental effects was generally rated as positive.

Overall, the 20-Year FMP is likely to reduce or prevent adverse effects identified in the 1995 EIS through the implementation of new practices that minimize adverse effects. Many of the uncertainties identified in the 1995 EIS have also been resolved. Key features of the 20-Year FMP that have resulted in positive ratings include:

- The addition of new public involvement processes (i.e., Communities of Interest Advisory Committee) in addition to the existing processes (i.e., Stakeholders Advisory Committee).
- The use of the "Patchworks" computer model to generate the harvesting plan for FMU 13.
  - This model had the capability to consider multiple constraints in formulating the plan, which meant that diverse factors, ranging from conservation of biodiversity to minimizing road density to maximizing harvest within the Annual Allowable Cut, could be considered simultaneously.
- Commitment to follow Best Management Practices (BMP) and to implement these BMPs in training LP staff and contractors.
- The use of a new Annual Allowable Cut for the FMU 13 area, which was recently issued by the Province.
- The use of a new Forest Resource Inventory, which was recently released by the Province.
- Long-term growth and yield information that LP generated through permanent sample plot studies.
- Results of various research projects that were supported by LP as well as issuance of new guidebooks and procedures based on the results of some of these projects, have improved operating procedures and reduced uncertainty.
  - The use of the forest by neotropical birds is one of the areas of uncertainties that LP has resolved through research.
- Changes to some of the practices outlined in the 10-Year Standard Operating Procedures were made in the context of the 20-Year Standard Operating Guidelines (SOGs). For example:
  - The 1995 EIS concluded that the effects of the 10-Year FMP on cavity-nesting woodpeckers would be an overall long-term reduction in availability of suitable nest trees. In addition, public and scientific evaluation of the 10-Year FMP expressed considerable concern regarding impacts of harvest activity in FMA#3 on Neotropoical

Migrant Birds (NTMB). In response to these potentially adverse impacts and concerns, LP made a substantial effort to conduct research to evaluate NTMB response to harvest activity and use of habitat in FMLA#3. These monitoring efforts are reflected in changes to the 20-Year FMP Fish and Wildlife Objectives which incorporate the use of indicator species to manage for wildlife habitat biodiversity.

- Uncertainties were noted in the 1995 EIA regarding impacts of the 10-Year FMP harvest strategies on understory vegetation.
  - LP has addressed these uncertainties through research conducted on permanent sample plots designed to monitor understory response to harvest strategies, as well as success in understory protection practices.
- Uncertainties associated with a lack of information on impacts of harvest activities on small mammals, amphibians and invertebrate species are being addressed through LP's ongoing monitoring efforts within the company and through collaborative research with non-government- and university-affiliated organizations.
- New procedures for sharing information and communicating with contractors have been implemented.
  - An example is LP's requirement for their contractor's to attend best management practices meetings each year.
- A stream-crossing assessment procedure has been developed and is practiced on an ongoing basis.

It should be noted that, while a number of these activities were not outlined in the 10-Year FMP, LP implemented many of them during the timeframe covered by the 10-Year FMP. Many of these practices are already in place and LP has assured Tetr*ES* that they will continue during the 20-Year FMP.

3.2 NEUTRAL/NEUTRAL-POSITIVE: NO CHANGE IN EFFECTS

In the process of comparing the 10- and 20-Year FMPs, some factors were noted as remaining constant. These factors, such as the following, were rated as "neutral" in terms of the change in environmental effect between the 10- to 20-Year FMPs:

- Forest health objectives in both the 10- and 20-Year FMPs continue to comply with provincial regulations related to fire prevention and insect and disease monitoring and containment. Thus, no change has occurred between the 10- and 20-Year FMPs.
- Forest renewal standards set by Manitoba Conservation continue to be met in the 20-Year FMP. Although the wording in the 20-Year FMP has altered somewhat, LP's intent and commitment to comply with the provincial renewal standards remains constant. Thus, a "neutral" rating was given to the 20-Year FMP treatment and re-treatment objectives.

3.3 NEGATIVE: INCREASES IN ADVERSE EFFECTS

There was only one factor identified where adverse effects had the potential to increase. In the 10-Year Plan it was noted that "all points within a cutblock should be within 200 m of cover". The comparable text in the 20-Year FMP states that "leave patches should be no more than 400 m apart or within 400 m of contiguous forest". The 20-Year FMP has increased the distance that wildlife cross when moving from cover at the cutblock edge to cover provided by a patch.

It should be noted that both the 10-Year and 20-Year FMP approaches to this issue are consistent with provincially-developed forestry-wildlife guidance. The determination is somewhat dependent upon the value of "leave patches" as wildlife "cover". The evaluation utilized the assumption that it was unlikely that site-specific characteristics of the variety of possible "leave patches" would satisfy the needs as "cover" for all wildlife species.

The 20-Year FMP could therefore result in an effective increase from 200 m to 400 m, the distance to "cover" for some species. While this aspect of the 20-Year FMP could result in a decrease in the effective utilization of the habitat in cutblocks by some wildlife species, this potential for an exaggeration of an existing "adverse or negative effect must be balanced

against the number of positive additions to the 20-Year FMP (compared to the 10-Year FMP) involving a broad ecosystem-based planning process guided by a comprehensive set of modelling tools. It is anticipated that the ecosystem-based approach integrated into the 20-Year FMP will result in an overall benefit regarding the availability of diverse wildlife habitats, effect utilization of those habitats and potentially with respect to wildlife populations in the area.

3.4 UNCERTAIN

A factor described as “uncertain” generally reflected a topic that required more information in order to evaluate. There was only one factor identified as uncertain that may require more quantitative or qualitative description in the text of the 20-Year FMP. The 10-Year FMP specifies that cutblock size will range from approximately 3-103 ha. The 20-Year Plan mentions variables (adjacent streams and buffers, natural boundaries, local recreation values) that will determine cutblock size, however, a specific range of hectares is not specified.

4.0 CONCLUSIONS REGARDING CHANGES IN ENVIRONMENTAL EFFECTS

It is anticipated that the implementation of the 20-Year FMP will not result in any new significant adverse environmental effects and instead is likely to reduce or prevent many of the potential adverse effects noted in the 1995 EIA (Tetr*ES* 1995). The reduction in adverse environmental effects associated with the 20-Year FMP, as compared with effects identified in the 10-Year FMP EIA, is in large measure a result of the many procedures that have been implemented over the past 10 years towards improving environmental protection within FMLA #3. As LP has indicated to Tetr*ES* personnel in discussions, these proven and effective measures will continue to be used during the 20-year FMP. The remaining effects relate to changes in forest age class that occur as a result of harvesting. Although these effects cannot be completely mitigated, as described in detail in the 10-Year FMP EIA (Tetr*ES* 1996), Tetr*ES* understood LP does have procedures in place (i.e., leave areas, forest renewal) to reduce these effects to the extent possible.

TABLE 1: CHANGES IN EFFECT FROM THE 10-YEAR TO THE 20-YEAR FMP						
Management Category	**Sections**	**Positive**	**Neutral - Positive**	**Neutral**	**Uncertain**	**Negative**
Management Objectives	Ecological Objectives	4	0	0	0	0
	Timber Supply Objectives	4	0	1	0	0
	Forest Protection Objectives	0	0	3	0	0
	Road Development and Access Management Objectives	1	0	0	0	0
	Silviculture	1	0	5	0	0
	Water Objectives	1	3	0	0	0
	Fish and Wildlife Objectives	3	0	4	0	0
Subtotal Management Objectives		*14*	*3*	*13*	*0*	*0*
Management Strategies	Ecological Strategies	0	2	0	0	0
	Timber Supply Strategies	3	1	4	0	0
	Forest Protection Strategies	3	0	0	0	0
	Road Development and Access Management Strategies	1	0	0	0	0
	Silviculture	4	1	3	0	0
	Water Strategies	3	1	1	0	0
	Fish and Wildlife Strategies	6	1	13	0	1
Subtotal Management Strategies		*20*	*6*	*21*	*0*	*1*
Forest Development Activities	Harvest Operations	7	1	3	0	0
	Road Development, Access Management, and Other Infrastructure Development	7	1	2	0	0
	Forest Renewal Methods and Activities	2	1	4	0	0
	Forest Health	0	1	1	0	0
Subtotal Forest Development Activities		*16*	*4*	*10*	*0*	*0*
Operating Practices	Harvesting Block Planning	8	0	6	1	0
	Heritage Resources	1	0	0	0	0
	Access Management	5	0	5	0	0
	Harvesting Operations	1	2	1	0	0
	Forest Renewal/ Silviculture Practices	5	1	3	0	0
	Forest Protection	0	0	3	0	0
	Environmental and Ecosystem Maintenance	1	0	1	0	0
Subtotal Operating Practices		*21*	*3*	*19*	*1*	*0*
Grand Total		***71***	***16***	***63***	***1***	***1***

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Wood Supply Analysis								
Management Objectives and Rationale								
Ecological Objectives								
Biodiversity Objectives	Management of biodiversity in vegetation communities	Maintain or enhance diversity of vegetation communities and forest structure (Sec 9.4.1, 10-year FMP).	Changes in the biodiversity of the study area were difficult to predict. In general, the mean forest stand age would be somewhat decreased by FMP implementation. There was inadequate information on individual species habitat utilization/availability, as well as on the study area and in the scientific literature. Therefore, it was not possible to predict whether FMP activities would result in either an increase or decrease in regional biodiversity. Some loss of genetic diversity was expected as a result of artificial regeneration of cutblocks. (Sec 9.1.1.9, 1995 EIS).	To provide strategic direction to the plan development team in order to best maintain those forest values associated with the concept of biodiversity. Management of biodiversity will: 1) occur at a coarse-filter or landscape level (focused on forest songbirds), 2) include a fine filter approach analyzing Ecological Representative Areas (rare ecosites), and 3) will follow Recommended Strategic Design (Section 4.3, Sec 8.1.2.8, 20-year FMP).	Songbird monitoring efforts address uncertainties described in the 1995 EIS regarding residual effects of the FMP on Neotropical Migrant Birds. These efforts are expected to improve biodiversity management practices in the FML#3. Management of biodiversity at varying scales, from coarse landscape level to fine scale focus on individual rare ecosites will contribute to the goal of maintaining pre-harvest levels of biodiversity. Strategies including management of understory vegetation, maintenance of genetic diversity in reforested areas, and conservation of riparian habitat through upgraded stream assessment and road development practices exemplify positive changes to the 20-Year FMP strategies for management of biodiversity in the Plan area.	The use of avian indicator species to maintain representative ecosystems in the FMLA#3 has been added to the description of biodiversity management in the 20-Year FMP. 20-year FMP specifies that biodiversity will be managed at a landscape scale and adds 'wildlife habitat' to the 10-Year FMP focus on 'vegetation communities and forest structure'. The 20-Year FMP adds a Strategic Design that is based in scientific research and takes a more holistic approach to biodiversity management.	**Positive**	Ongoing research with avian indicator species will continue to increase knowledge of associated wildlife species and forest habitat, Continued study of relationships between songbirds and associated wildlife species will likely improve management design. The management of biodiversity at varying scales is based on an innovative model (Remple 2006 in press) and is supported by data collected in ongoing studies conducted by LP and collaborations with universities and non-government organizations. Recent scientific research (Rajora 2000, in press), long-term ecological monitoring projects, and attendance of Best Management Practice training contribute to LP's goal of maintaining genetic and structural diversity in harvest areas and regenerated stands, and conserving habitat in fish-bearing streams.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Management of biodiversity in terrestrial and aquatic communities	Sustain biological diversity (Sec 9.4.1, 10-Year FMP).	Changes in the biodiversity of the study area were difficult to predict. In general, the mean forest stand age would be somewhat decreased by FMP implementation. There was inadequate information on individual species habitat utilization/availability, as well as on the study area and in the scientific literature. It was not therefore possible to predict whether FMP activities would result in either an increase or decrease in regional biodiversity. Some loss of genetic diversity was expected as a result of artificial regeneration of cutblocks. (Sec 9.1.1.9, 1995 EIS).	Maintain or enhance the biodiversity of terrestrial and aquatic communities and associated ecological processes (Sec 7.6.5.2.1, 20-Year FMP).	Impacts on terrestrial and aquatic systems may be reduced with possible positive impacts on biodiversity in wildlife communities.	20-Year FMP uses new language that specifies terrestrial and aquatic communities, thereby adding animals to the groups to be maintained or enhanced.	**Positive**	This activity may address issues of data deficiencies regarding terrestrial and aquatic invertebrate and amphibian communities. Additional information of methods used to maintain and enhance biodiversity is needed for further assessment. If these methods are equivalent to coarse-filter monitoring described above, then concerns described above also apply.
Forest Connectivity Objectives	Forest Connectivity	Forest connectivity is not discussed as an Objective in the 10-Year FMP. Forest Connectivity is discussed in Fish and Wildlife Strategies, Corridors and Critical Areas, under "Maintenance of corridors and protection of seasonal habitat."	NA	Forest connectivity is discussed in terms of distribution of wildlife trees in cutblocks (Sec 7.6.5.2.3, 20-Year FMP). In addition, the landscape design concept described with respect to management of Ecologically Representative Areas and Rare Ecosites (Sec. 4.3, 20-Year FMP) incorporates many aspects of forest connectivity and provides a conceptual link between Habitat Management techniques and Biodiversity Conservation goals.	Implementation of the goal to retain clumps of wildlife trees in a pattern that increases connectivity at stand and landscape scales is expected to reduce hunting pressure on ungulates and impacts of harvest activity on area sensitive species.	The incorporation of Variable Retention in cutblocks and the Coarse and Fine filter Frameworks for Conservation of Biodiversity represent substantial additions of strategy detail and ecologically principled intent in the 20-Year FMP.	**Positive**	Minor addition of text in Section 4.3 would be all that is needed to explicitly describe an implied Forest Connectivity Objective.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Ecological Integrity Objectives	Maintenance of Ecological Integrity	The 10-Year FMP lists one of four Implementation Objectives as "Regulate the forest to balance age classes, so that all age classes are represented on the landscape, which will in turn allow for maximum species and genetic diversity" (Sec 5.1, 10-Year FMP). This objective indicates a move toward landscape-scale forest management and the related intention to incorporate Ecosystem-Based Management practices (Sec 7.2 10-Year FMP).	LP has committed to emerging Ecosystem-Based Management. Their commitment to perform Pre-harvest Surveys, various monitoring programs to collect a wide variety of ecological information, and LP's utilization of GIS, to store and organize information collected in the area will assist LP to ensure its future management plans will be more ecologically informed and eco-unit based (Sec 8.2, 1995 EIS).	The 20-Year FMP lists one of two Implementation Objectives as "Maintain ecosystem health and function." This objective is supported by the intent to keep forest units stable, and thus maintain the integrity of a landscape design composed of rare ecosites and biodiversity hotspots (Sec 4.3.2, Sec 4.4.4.1, Sec7.1.1.5, 20-year FMP).	Given the assumption that stable representation of forest units across the planning period will maintain the integrity of rare ecosites and biodiversity hotspots is correct, then this Implementation Objective should reduce residual impacts of harvest activities that occur in areas where rare ecosites are in relatively high abundance (Sec 7.1.1.5 20-year FMP).	The conceptual progression in LP's management objectives from 1995 to 2006 is marked by a shift from intended to applied practice of ecologically based principles. Research in the study area has increased knowledge of local natural systems and habitat relationships and impacts of harvest activities. The wording of the 10 and 20-year FMP Implementation Objectives reflects a better understanding of these relationships.	**Positive**	Although the 20-Year FMP reflects a better understanding of how to maintain ecosystem integrity, tests of LP's assumptions regarding relationships between stability of ecounits and maintenance of biodiversity will require long-term monitoring and potentially adaptation of forest practices to conserve rare or sensitive habitat and species.
Timber Supply Objectives								
Timber Supply Sustainability Objectives	Timber Supply Sustainablity	No objective indicated except Management and Application of Annual Allowable Cut levels as established by Manitoba Natural Resources, to be achieved through meeting (or proposing to meet); Applying Manitoba's Forest Policies 10 principles and six guidelines.	Since no objective was specified, no residual effects could be determined.	An objective to "provide goods and services for future generations" is stated. Also under this objective is a strategy to maintain stable harvest levels over time (Sec. 7.1.2.4, 20-Year FMP).	There are no direct environmental effects related to timber supply objectives. Any environmental effects as a result of these objectives pertain to the process of harvesting and these effects are discussed elsewhere within this table.	An objective for this parameter has been added to the 20-Year FMP. LP has used the Government of Manitoba's determination of sustainable annual allowable cut levels to guide the assessment of other sustainability goals into forestry planning.	**Positive**	The addition of an objective for timber supply sustainability is expected to have a positive effect.
Softwood/Hardwood/ Mixedwood Management Objectives		No "objective" as such identified.	Since no objective was specified, no residual effects could be determined.	There is an objective to "maintain ecosystem health and function", which includes a strategy to "maintain the representation of the current range of ecosystem groups and associated forest species composition" (Sec. 7.1.1.1, 20-Year FMP). This strategy is relevant to softwood/hardwood/mixed wood management objectives.	Some reductions are expected in mixedwood stands that become hardwood following harvest and renewal treatments on the managed portion of the land base (Sec. 7.1.1.1, 20-Year FMP).	An objective with a strategy that is relevant to this issue has been added to the 20-Year FMP.	**Positive**	It is expected that the inclusion of this objective and related strategy in the plan will prevent or reduce environmental effects.
Fibre Priorities Objectives		No "objective" as such identified.	Since no objective was specified, no residual effects could be determined.	The "strategy to maintain forest health" under the objective to "maintain ecosystem health and function" notes target areas for accelerated harvest but no other objectives or strategies are relevant to fibre priorities.	Residual effects relate to the practice of harvesting, not necessarily to this objective. Residual effects of harvesting pertain to changes in age class and habitat.	An objective with a strategy that is relevant to this issue has been added to the 20-Year FMP.	**Positive**	It is expected that the inclusion of this objective and related strategy in the plan will prevent or reduce environmental effects.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Harvest Priorities Objectives		Harvest Priority Objectives are referred to in the 10-Year FMP in relation to Sustainability of harvest scenarios (Sec 7.1.3, 10-Year FMP) and in the SOPs regarding Cutblock Planning and harvest priorities (Sec 9.3.1, 10-Year FMP). In both sections, the Plan identifies that the oldest trees will generally be harvested first.	The 1995 EIS notes that much of the FMLA is dominated by older forest stands and that, in order to fully utilize these volumes, harvest activities could result in large areas of younger stands. This would result in a reduced harvestable volume. It was noted that alternative harvest strategies might alleviate this undesirable condition (Sec 8.3.2.4, 1995 EIS).	The 20-Year FMP Objectives to maintain ecosystem health and function, and to provide goods and services for present and future generations is supported by the strategy to maintain the existing range of forest structure conditions over the long term. LP acknowledges that harvesting the oldest stands first may decrease the overall age of the forest and therefore plans to implement a scenario that will ensure some older forest structure is maintained (Sec 7.1.1.2, 20-Year FMP).	Concerns raised in the 1995 EIS related to a general reduction in age class within the FMLA may be alleviated through this move away from harvesting oldest aged trees first. In addition, LP's intent that harvest priorities incorporate maintenance of habitat types strongly associated with old growth stands is consistent with the Company's ecological priorities.	The intent to maintain forest structure including mature and overmature stands in the Plan area represents a change in harvest scenario from the 10- to the 20-Year FMP.	**Positive**	It is expected that the inclusion of this objective and related strategy in the plan will prevent or reduce a widespread reduction in age class throughout the plan area and will also conserve habitats that are strongly associated with old growth forest stands.
Utilization Standard Objectives		The 10-Year FMP complies with utilization Standards set by the Province (Sec 9.7.2, 10-Year FMP).	Because LP complies with mandatory Provincial standards, Utilization Standards are not discussed in the 1995 EIS.	The 20-Year FMP complies with utilization Standards set by the Province.	LP's compliance with Provincial Utilization standards is not expected to change in the 20-Year FMP.	No change in compliance with Provincial Utilization Standards has occurred between the 10- and 20-Year FMP.	**Neutral**	Compliance with Provincial standards is expected to continue in the 20-Year FMP.
Forest Protection Objectives								
Forest Health Objectives	Forest Protection	As part of their agreement to comply with provincial forest protection policy, LP has developed objectives related to forest health including: • Establishment of fire, insect and disease prevention management where ecologically appropriate. • Sponsor research, implement fire management information systems, and monitor effects of fire, insects and disease. • Provide information to and assist communities in development of join agreements, and cooperate with public, industry and government to address issues of wildfire, insects and disease (Sec. 5.2.1, 10-Year FMP).	Residual effects of LP's forest protection plan are not discussed in the 1995 EIS.	The 20-Year FMP lists one of two Implementation Objectives as "Maintain ecosystem health and function" (Sec 7.1.1). LP's forest health objective is modeled on the principles of Manitoba's Integrated Forest Pest Management (IFPM), which is enacted on an operational scale with a fine filter approach (Sec 7.1.1.7, 20-Year FMP)	In terms of pest and disease management and fire protection, a Forest Health Objective is mentioned indirectly in relation to maintenance of ecosystem health (Sec 7. 1.1, 20-Year FMP). Later more specific detail is given regarding IFPM and LP's plan to apply management strategies to mitigate pest and disease impacts on the forest resource (Sec 7.1.1.7, 20-Year FMP). In this sense, the Objective of maintaining ecosystem health will likely provide appropriate management of forest health in the study area.	Although wording and location of forest health discussion has changed in the 20-Year Plan, there has been no substantial change in LP's intent to manage for and maintain forest health in FMA #3.	**Neutral**	LP continues to note the presence of forest health threats as detected during Pre-harvest Surveys. The 20-Year FMP has re-organized how and where this issue is addressed in the Plan without making substantial changes to implementation or intent.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Fire and Fuels Objectives		Although it is noted as a Key Issue rather than as an Objective in the 10-Year FMP, LP recognizes that it is required to prepare a Fire Protection/ Suppression Plan that describes LP's equipment, manpower and transportation facilities available to the province for the prevention, detection and suppression of fire Sec 8.3, 10-Year FMP). There is no mention in the 10-Year FMP of a Fires and Fuels Objective.	Residual effects of LP's forest protection plan are not discussed in the 1995 EIS.	Management of fire and fuels is in terms of LP's continued support to the Province of Manitoba through collaborative monitoring projects (Sec 4.4, 20-Year FMP), equipment and manpower availability, and maintenance of firebreaks and reduction of slash loading. For more discussion of the 20-Year FMP forest protection plan, see Forest Protection Strategies below.	LP's support of provincially regulated fire protection and monitoring, as well as the Company's use of firebreaks and reduced slash loading in harvested areas is expected to continue to reduce risk of fire damage to the FMLA.	None	Neutral	The 20-Year FMP has re-organized how and where this issue is addressed in the Plan without making substantial changes to implementation or intent.
Insect and Disease Objectives		As noted in the 10-Year FMP Key Issues the Forest Act and regulations and the FMLA state that the Province is responsible for insect and disease management. However, LP must annually file a plan outlining how the company proposes to protect the forest area and manage known insect or disease problems within the FML#3 (Sec 8.3, 10-Year FMP). There is no mention in the 10-Year FMP of an Insect and Disease Objective.	Residual effects of LP's forest protection plan are not discussed in the 1995 EIS.	Insects and disease are discussed in terms of LP's Integrated Forest Pest Management (IFPM) program (Sec 4.4.5, 20-Year FMP). . This program controls pest and disease impacts through the use of combinations of silvicultural, biological and chemical control, genetic resistance, quarantine, and passive management. For more discussion also see Forest Protection Strategies below.	LP and the Province continue to share responsibility for managing insects and disease in the Plan area.	None	Neutral	The 20-Year FMP has re-organized how and where this issue is addressed in the Plan without making substantial changes to implementation or intent.
Road Development and Access Management Objectives								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Road Development and Access Management Objectives	Access Management Objectives	Access management objectives for siting, construction, operation, maintenance and decommissioning of roads include - Maintain unique and critical habitats - maintain water quality and aquatic environments - permitting passage of peak surface and stream flows - permitting passage of fish in streams - preventing deposition of slash debris and dirt into all aquatic environments (Section 9.6.3 10-Year plan).	The stated practices were expected to reduce adverse effects of road construction associated with erosion, alteration of water runoff and infiltration. The EIS does not describe effects associated with maintaining unique and critical habitats.	Objectives identified for Forest Roads include: - maintain water quality and prevent deposition of slash, debris, and dirt into all aquatic environments - maintain biodiversity in both terrestrial and aquatic environments - protect fish and fish habitat and maintain passage through streams - protect and maintain identified unique and critical habitats - maintain passage for natural surface and stream flow regimes - minimize loss of productive forest land - protect identified traditional and cultural resources (Sec 7.6.2.6, 20-Year FMP) In addition to these Objectives, LP has created an Implementation Objective to "maintain ecosystem health and function", which is supported by an overriding strategy to "conserve ecosystem condition and productivity by limiting road length, duration and density" (Sec 7.1.1.4, 20-Year FMP).	The implementation of this Objective and accompanying Strategy is likely to reduce environmental effects associated with road construction and use.	The addition of LP's goal to limit road length, duration, and density on an Implementation level of the Plan indicates a shift in focus to more overarching awareness of road impact and an intention to minimize this impact.	**Positive**	The objective and related strategy is likely to reduce residual environmental effects related to road development.
Silviculture								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Treatment and Retreatment Objectives	Forest Renewal Treatments	In compliance with Forest Renewal standards for Forest Regeneration in MB and LP's commitment to maintain ecosystems and their biodiversity, LP will undertake forest management activities to promote reestablishment of a similar forest stand to the original cover type. Methods to this end will include: • Preservation of softwood understory (density and species) in hardwood cover types. • Scarification of jack pine and shallow soil sites • Manual clearing and planting as well as natural suckering. • Competition control through the use of herbicides.	In general, the harvest procedures outlined in the SOPs and the AOPs have potential to result in minimal disruption of soil and surface vegetation on cutblocks (Sec 9.1.1.5.3, 1995 EIS).Appropriate scarification methods can result in a more receptive seedbed for conifer species. However, if hardwood species are already present in a cutblock, there can often be a shift towards regeneration of proportionally more hardwoods (Sec 9.1.1.5.2, 1995 EIS).	The Objective to maintain ecosystem health and function is supported in LP's 20-Year FMP by the intent to maintain forest productivity through prompt forest renewal. LP defines ecosystem function as including elements of species composition, structure and pattern, Silvicultural treatments employed by LP are designed to maintain these three elements through • Protection of understory. • Manual planting and thinning, • Natural regeneration through suckering (Sec 7.1.1.6, 20-Year FMP). • See also discussion of Silvicultural Site Preparation Strategies below.	Uncertainties related to regeneration of understory and maintenance of forest species composition may be addressed if this objective is met. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site.	Though wording has been changed slightly, silvicultural treatment objective remain largely the same in the 10- and 20-Year FMP.	Neutral	These Objectives and corresponding regeneration treatments are indicative of LP's intent to maintain biodiversity and adhere to provincial and the Sustainable Forestry Initiative. Although the two Implementation Objectives described in Chapter 7 of the 20-year Plan are more general and inclusive of ecologically sound forestry practices, LP's intent to regenerate the same habitat as that which was harvested is functionally unchanged from the 10- to 20-yer plan.
Reforestation Lag Period Objectives	Forest Renewal Timing Objectives	Forest renewal activities will generally be undertaken within one or two years after timber removal (Sec 5.2.4, 10-Year FMP). The prescription for the timing of harvest operations will be designed to maximize natural regeneration and minimize site disturbance (Sec 5.2.4, 10-Year FMP).	Residual effects of LP's timing of renewal activities are not discussed in the 1995 EIS. In general, the renewal timing objectives described in the 10-Year Objectives have potential to result in minimal disruption of soil and surface vegetation on cutblocks (Sec 9.1.1.5.3, 1995 EIS).	The 20-Year FMP does not discuss Objectives that speak specifically to Reforestation Lag Periods. However, see discussion of Tree Planting timing described below in Forest Renewal Methods and Activities	Timing of forest renewal, as it relates to Implementation Objectives, will likely reflect LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity found in the 20-Year FMP study area. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site.	Although the 20-Year FMP Implementation Objectives do not address forestry practices as timing of planting, this information is instead discussed in terms of Activities (Forest Renewal Methods and Activities). Thus, the intent of LP's management plan has not changed; it is organized differently in the 10- and 20-Year FMP.	Neutral	The complexity of the 20-Year FMP would be increased if objectives of each silvicultural activity were added to the already detailed description of Implementation Objectives in Chapter 7. The list of SOGs associated with Silvicultural practices seems substantially developed as it is.
Site Productivity Objectives	Site Productivity	Forest renewal involves many activities designed to assist areas, which have been harvested, burned, etc., to return to a healthy growing condition. Renewal activities are generally selected and designed to enhance the succession that would occur naturally and meet provincial renewal standards. Some activities may be planned to support sustained yield management and increase the allowable cut of all species (Sec 5.2.4, 10-year FMP)	Residual effects of activities designed to increase site productivity are not discussed in the 1995 EIS. In general, site productivity objectives described in the 10-Year Objective have potential to result in minimal disruption of soil and surface vegetation on cutblocks (Sec 9.1.1.5.3, 1995 EIS).	The Objective to maintain ecosystem health and function is supported in LP's 20-Year FMP by the intent to maintain forest productivity through prompt forest renewal.	Site Productivity, as it relates to Implementation Objectives, reflects LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity found in the 20-Year FMP study area. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site.	The 20-Year FMP Implementation Objectives do not address specifics of site productivity. Although the 10- and 20-Year FMP are organized differently, the intent of LP's management plan has not changed.	Neutral	The complexity of the 20-Year FMP would be increased if objectives of each silvicultural activity were added to the already detailed description of Implementation Objectives in Chapter 7. The list of SOGs associated with Silvicultural practices seems substantially developed as it is.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Reforestation Potential Objectives	Renewal Activity Objectives	Renewal activities are generally selected and designed to enhance the successions that would occur naturally and meet provincial renewal standards. Some activities may be planned to support sustained yield management and increase allowable cut of all species. Specific forest renewal activities vary according to the conditions and characteristics of the area (Sec 5.2.4, 10-year FMP).	In general, the renewal objectives outlined in the 10 Year Objectives have potential to result in minimal disruption of soil and surface vegetation on cutblocks (Sec 9.1.1.5.3, 1995 EIS).	The Objective to maintain ecosystem health and function is supported in LP's 20-Year FMP by the intent to maintain forest productivity through prompt forest renewal. Renewal activity objectives, including maintenance of species composition, structure, and pattern, contribute to the general Implementation Objective above.	Renewal activity, as it relates to Implementation Objectives, will likely reflect LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity found in the 20-Year FMP study area. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site.	The 20-Year FMP Implementation Objectives do not address specifics of site productivity. Although the 10- and 20-Year FMP are organized differently, the intent of LP's management plan has not changed.	Neutral	The complexity of the 20-Year FMP would be increased if objectives of each silvicultural activity were added to the already detailed description of Implementation Objectives in Chapter 7. The list of SOGs associated with Silvicultural practices seems substantially developed as it is.
Growing Stock Objectives	"Plus" trees, seed orchards, and cones	Substantial improvements in growth rate are possible if tree seedlings are grown from seed collected from naturally superior native stock. Seed from two white spruce orchards will be collected when the orchards are operational. Until then, cones will be collected from all three major softwood species in their respective zones in the FML#3 and stored at MB's Pineland Tree Seed Nursery. There is currently no similar program for hardwoods (Sec 5.2.4, 10-Year FMP).	LP plans to assist with collection of seed from the local area and plant healthy coniferous stock produced from this seed. While these actions will minimize impacts on the regions softwood genetic pool, a minor long-term impact to genetic diversity has potential to occur (Sec 9.1.1.5.4, 1995 EIS).	The 20-Year FMP does not discuss Objectives that speak specifically to Growing Stock Objectives. However, see discussion of Forest Renewal/Silviculture Practices, Seed Inventory below.	Growing stock, as it relates to Implementation Objectives, will likely reflect LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity found in the 20-Year FMP study area. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site	Although the 20-Year FMP Implementation Objectives do not address growing stock, this information is instead discussed in terms of Practices (Forest Renewal/Silvicultural Practices). Thus, the intent of LP's management plan has not changed; it is organized differently in the 10- and 20-Year FMP.	Neutral	The complexity of the 20-Year FMP would be increased if objectives of each silvicultural activity were added to the already detailed description of Implementation Objectives in Chapter 7. The list of SOGs associated with Silvicultural practices seems substantially developed as it is.
Establishment Period Objectives		Establishment period is not discussed in terms of objectives in the 10-Year FMP. For discussion of timing of reforestation activities see Silvicultural Reforestation Strategies below.		Establishment period is not discussed in terms of objectives in the 20-Year FMP. For discussion of timing of reforestation activities see Silvicultural Reforestation Strategies below.		NA	NA	
Greenup Period Objectives		Green-Up period is not discussed in terms of objectives in the 10-Year FMP. For discussion of timing of reforestation activities see Silvicultural Regeneration Strategies below.		Green-Up period is not discussed in terms of objectives in the 20-Year FMP. For discussion of timing of reforestation activities see Silvicultural Regeneration Strategies below.		NA	NA	

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Growth Rates Free-to-Grow Objectives	Free-to-grow standards and surveys	Free-to-grow standards are currently being developed by the Manitoba Conservation (MC) to measure the progress of a regenerating stand and its free-to-grow deadline. Surveys may be conducted past the regeneration period. Survey procedures, assessments, and definitions are currently being developed by MC and will be reviewed by LP for incorporation into the silvicultural practices for FML#3 (Sec 9.9.10, 10-Year FMP).	Residual effects of LP's Free-to-grow standards and surveys are not discussed in the 1995 EIS.	Free-to-grow (FTG) standards have been developed by the Province for black spruce, jack pine, and white spruce. These standards quantitatively determine whether a harvested site is 'free-growing' or not, and give the site an appropriate forest type classification. The assumption is that sites that achieve the Provincial FTG standard will develop into a mature stand/forest. 14 years post-harvest/renewal treatment, the FTG survey will be conducted on all sites by surveyors trained and licensed by the Province of MB (Sec. 7.6.4.12, 20-Year FMP).	LP's commitment to implement MB Free-to-grow standards and surveys will increase knowledge of re-growth and stand community interactions. Standardization of surveyor training will likely improve quality of data collected and overall integrity of survey conclusions.	Free-to-grow standards have been developed and surveys implemented for MN forestry practices.	**Positive**	Implementation of Free to Grow standards and standardization of follow-up surveys will likely improve the success of regeneration efforts and increase the quality of evaluations of these efforts.
Water Objectives								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Water Quality Objectives	Water Quality	LP plans to operate under the framework of integrated resource management and to meet the requirements of the FML Agreement, Licence, and all applicable legislation pertaining to forest management on FML#3 (Section 5.1, 10-Year FMP). In addition, LP identifies the following goals related to maintaining water quality - to follow recommended Stream Crossing Guidelines - assess the potential for erosion in Pre-harvest Surveys - create a road use strategy to reduce long-term effects of roads on water courses - work with government departments and LGDs to assess flood potential and ensure crossings are of sufficient size to accommodate high flows - seasonally control access to roads where erosion could occur from rutting - be knowledgeable about and participate in programs to assess the presence of fish and ensure culverts do no block spawning access - have buffers of sufficient size and condition to protect water bodies. (Sec 8.6, 10-Year FMP)	The 1995 EIS noted that LP was particularly attentive to adverse effects of runoff and sediment displacement associated with roads. Tit was concluded that this and LP's strategies for erosion prevention and sediment control measures in adherence to the draft MDNR/DFO Stream Crossing Guidelines would likely reduce potentially adverse effects of forestry practices to acceptably low levels(Sec 9.1.1.7.2-3, 1995 EIS). In addition, the EIS concluded that LP's commitments to the wise use of riparian buffers and an absence of intent to alter stream morphology would mitigate potentially adverse effects to acceptably low levels (Sec 9.1.1.7.4-7, 1995 EIS).	Descriptions of Water Quality Objective s that are comparable to those in the 10-Year FMP are dispersed throughout the 20-Year FMP. For more discussion of Water Quality Objectives see Road Development and Access Management Objectives (above), as well as Fish and Wildlife Objectives under Aquatic and Riparian Habitats (below). In addition to these discussions, the Implementation Objective to "provide goods and services for future generations" contains a Strategy to "limit disturbances within sub basins to 30%, as defined by the Department of Fisheries and Oceans (Sec 7.1.2.2, 20-Year FMP).	The addition of LP's intent to limit cumulative harvest to 30% within watersheds is expected to reduce residual impacts to wildlife habitat in the Plan area.	Water Quality Objectives have been developed and described in greater detail In the 20-Year FMP, In addition, LP commits to a limit for cumulative harvests within watersheds of not greater than 30%.	**Positive**	The Company's commitment to ecologically sound forestry practices is reflected in the 30% harvest limit as well as generally increased detail in objectives to reduce impacts to water quality and thereby impacts on soil, vegetation, and wildlife.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Erosion Objectives	Erosion Prevention	See Water Quality Objectives above.	See residual effects of Water Quality Objectives above.	See discussion of Road Development and Access Management Objectives above.	LP's Objectives to prevent deposition of slash, debris, and dirt into all aquatic environments and to limit road length, duration and density is expected to minimize erosion resulting from road construction and forest operations. In addition, LP's decision to limit harvest operations to 30% within watersheds will likely reduce harvest impacts on erosion in the Plan area.	The 20-Year FMP contains greater detail in descriptions of erosion prevention. The inclusion of the 30% limit on harvest area within a watershed is also an addition to the 20-Year FMP.	**Neutral - Positive**	Although many of the Water Quality Objectives are consistent between the 10- and 20-Year FMP, detail has been added to these Objectives as well as new goals for harvest activities.
Siltation Objectives	Sedimentation Control	See Water Quality Objectives above.	See residual effects of Water Quality Objectives above.	See discussion of Road Development and Access Management Objectives above.	LP's Objectives to prevent deposition of slash, debris, and dirt into all aquatic environments and to limit road length, duration and density is expected to minimize sediment loading resulting from road construction and forest operations. In addition, LP's decision to limit harvest operations to 30% within watersheds will likely reduce sediment displacement in the Plan area.	The 20-Year FMP contains greater detail in descriptions of sediment control. The inclusion of the 30% limit on harvest area within a watershed is also an addition to the 20-Year FMP.	**Neutral - Positive**	Although many of the Water Quality Objectives are consistent between the 10- and 20-Year FMP, detail has been added to these Objectives as well as new goals for harvest activities.
Flooding Objectives	Flood Accommodation	See Water Quality Objectives above.	See residual effects of Water Quality Objectives above.	The discussion of Road Development and Access Management Objectives above mentions that LP will maintain passage for natural surface and stream flow regimes. This Objective further specifies that water crossing for Class I and II roads will be designed to handle flood volumes, which have historical frequency on average of 1 in 100 years.	LP's Objectives to design roads to accommodate high flow and flood level water will likely mitigate residual impacts of road placement and stream crossings in the Plan area. In addition, the LP's Strategy to limit road length, duration and density is expected to minimize potential for flood damage and related sediment loading..	The 20-Year FMP contains greater detail in descriptions of Water Quality Objectives, as well as the Company's commitment to limit road length, duration, and density.	**Neutral - Positive**	Although many of the Water Quality Objectives are consistent between the 10- and 20-Year FMP, detail has been added to these Objectives as well as new goals for road implementation in the Plan area.
Fish and Wildlife Objectives								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Habitat Objectives	Management of biodiversity in vegetation communities.	Maintain or enhance diversity of vegetation communities and forest structure (Sec 9.4.1, 10-Year FMP).	The mean forest stand age was expected to decrease as a result of the FMP. It was not possible to predict whether the FMP would result in either an increase or decrease in regional biodiversity, due to lack of information. Some loss of genetic diversity was expected as a result of artificial regeneration of cutblocks (Sec 8.3, 8.3.2.7.1- 2, 9.1.1.9, 1995 EIS).	Manage wildlife habitat biodiversity at a coarse-filter or landscape level (Sec 7.6.5.2.1, 20-Year FMP).	Management of wildlife habitat will reflect habitat requirements of songbird species and may under-represent habitat requirements of other plant and animal species or communities in FML#3. Specifically, issues of forest stand connectivity at large spatial scales (furbearers and large game species), subsurface aquatic habitat details (fish, amphibians and invertebrates), and forest understory structural complexity to an herbaceous cover level (invertebrates and amphibians) may not be addressed by managing for songbird habitat requirements.	20-Year FMP makes reference to managing biodiversity at a 'coarse-filter' level instead of maintenance or enhancement of diversity of vegetation communities or forest structure. Differences in these two methods for diversity management or maintenance are unknown.	Neutral	LP has participated in monitoring and research of forest ecosystems in the Swan River Valley that substantially increases the body of knowledge for this area. However, LP has selected to substantively focus its monitoring program on songbird research. While a focus on songbird-based habitat management may not address all uncertainties regarding the broad spectrum of wildlife management, it does represent an adaptive management approach to incorporate the results of scientific research conducted during the implementation of the 10-yr FMP into the 20-yr FMP. Ultimately the approach is expressed as a component of a vegetative community or forest structure habitat-based management approach that is an elaboration of the 10-yr FMP.
	Management of biodiversity in terrestrial and aquatic communities.	Sustain biological diversity (Sec 9.4.1, 10-Year FMP).	Changes in the biodiversity of the study area were difficult to predict. In general, the mean forest stand age would be somewhat decreased by FMP implementation. There was inadequate information on individual species habitat utilization/ availability, as well as on the study area and in the scientific literature. It was not therefore possible to predict whether FMP activities would result in either an increase or decrease in regional biodiversity. Some loss of genetic diversity was expected as a result of artificial regeneration of cutblocks (Sec 9.1.1.9, 1995 EIS).	Maintain or enhance the biodiversity of terrestrial and aquatic communities and associated ecological processes. (Sec 7.6.5.2.1, 20-Year FMP).	Impacts on terrestrial and aquatic systems may be reduced with possible positive impacts on biodiversity in wildlife communities.	20-Year FMP uses new language that specifies terrestrial and aquatic communities, thereby adding animals to the groups to be maintained or enhanced.	Neutral	This activity may address issues of data deficiencies regarding terrestrial and aquatic invertebrate and amphibian communities. Additional information of methods used to maintain and enhance biodiversity is needed for further assessment. If these methods are equivalent to coarse-filter monitoring described above, then concerns described above also apply.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Wildlife habitat management.	Manage the quantity, quality and duration of access to logging areas in a manner consistent with wildlife management strategies (Sec 9.4.1, 10-Year FMP).	Impacts on big game species by forestry activities proposed by the FMP will likely have a positive influence on habitat availability (except for woodland caribou), negative impacts on associated with disruption of sensitive habitats by road construction, and an increase in predation via increased hunting pressure resulting in higher big game mortality.	Conduct forest management activities in order to minimize disturbance on wildlife habitat. (Sec 7.6.5.2.1, 20-Year FMP).	Disturbance associated with harvest practices may be minimized to an extent that mitigates residual effects of forest management activities.	The 20-Year FMP uses different language with no change in commitment or intent.	**Neutral**	LP has undertaken various collaborations and partnerships to conduct research projects on wildlife species including study of small mammals (Sec 2.2.2 20-Year FMP) that have contributed to wildlife habitat management practices.
Riparian Objectives	Protection of aquatic and riparian habitats.	Prevent degradation or destruction of aquatic habitat from inappropriate implementation of stream crossings and aquatic buffer zone (Sec 9.4.1, 10-Year FMP).	Many of the key potential impacts to surficial water, ground water, terrestrial mammals, and birds in addition to aquatic resources such as fish and water quality are dependent upon the effectiveness of the forested buffer zones left by harvesting operations near water bodies. The type of harvest operations, season of harvest, trees species removed, harvest technique, in addition to the local soil type and topography and the dominant floristic species present all have a role in determining the impact any disruption near water bodies will have on the environment (Sec 9.1.1.7.1, 1995 EIS). On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Maintain or enhance integrity/diversity of riparian habitats and/or established aquatic buffer zones. (Sec 7.6.5.2.1, 20-Year FMP).	Efforts to maintain or enhance riparian diversity and buffer zone integrity may mitigate residual effects of FMP activity on aquatic habitat.	20-Year FMP substitution of 'Maintain or enhance integrity/diversity of riparian habitats' for 'Prevent degradation or destruction of aquatic habitat' is more proactive and reflects an upgrade in commitment.	**Positive**	Efforts to maintain integrity of buffer zones may alleviate uncertainties regarding waterfowl habitat requirements. Efforts to enhance riparian habitats may compensate deficiencies in data on fish-bearing waters, aquatic invertebrate and amphibian communities.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Escape Cover Objectives		Escape cover is not covered as an objective in the 10-Year FMP. However, this topic is discussed under Fish and Wildlife Habitat Strategies below.		Escape cover is not covered as an objective in the 20-Year FMP. However, this topic is discussed under Fish and Wildlife Habitat Strategies below.		NA	NA	
Shelter Objectives		Shelter is not covered as an objective in the 10- or 20-Year FMP. However, this topic is discussed under Fish and Wildlife Habitat Strategies below.		Escape cover is not covered as an objective in the 20-Year FMP. However, this topic is discussed under Fish and Wildlife Habitat Strategies below.		NA	NA	
Corridors and Critical Areas Objectives		Corridors and Critical Areas are not covered as an objective in the 10- or 20-Year FMP. However, this topic is discussed under Fish and Wildlife Habitat Strategies below.		Escape cover is not covered as an objective in the 20-Year FMP. However, this topic is discussed under Fish and Wildlife Habitat Strategies below.		NA	NA	
Access Objectives	Access Objectives	At the request of the Stakeholder Advisory Committee (SAC), LP developed road access strategies with the objective of establishing a balance to best address the needs of all groups using or effected by roads (sec 8.5, 10-Year FMP).	Residual effects of LP's Road Access Objectives are not discussed in the 1995 EIS.	The Implementation Objective to "manage wildlife habitat biodiversity at a coarse-filter or landscape level"(Sec. 7.6.5, 20-Year FMP) is supported by LP's intent to limit road length, duration, and density (Sec 7.1.1.4, 20-Year FMP). Also, see Road Development and Access Management Objectives above.	Disturbance associated with road construction, use, and footprint on the landscape may be minimized to an extent that mitigates residual effects of forest management activities.	Although the 10-Year FMP described LP's intent to minimize use of inactive tertiary roads left in place and to remove all closed roads, there is no mention of changes or modifications to the physical extent of planned roads. The 20-Year FMP expressly states LP's intention to minimize the footprint of roads in the FMA while maintaining strategies for closures and deactivations (Sec 7.1.1.4, 20-year FMP).	**Positive**	The addition of LP's intent to limit road length, duration of activity, and density is an improvement to the 20-Year FMP that will likely reduce negative impacts on wildlife species sensitive to road-related disturbances.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Vulnerable, Threatened, and Endangered Species Objectives	Protection of Rare, Threatened and Endangered (RTE) plant and animal species and critical habitat.	To protect specific habitat for plant and animal species considered at risk, threatened or endangered in each area (Sec 9.4.1, 10-year FMP).	The potential impacts on woodland caribou in the study area will be dependent upon the level of softwood harvesting activity inside caribou range. Therefore, significant impacts on the woodland caribou populations in the study area are not anticipated (Sec 9.1.1.6.1, 1995 EIS). Cavity nesting birds will likely experience an overall reduction in availability of suitable nest trees. However, if 'islands of habitat" are left in each cutblock, potential impacts to cavity nesters could be reduced. The 39 species of rare flora present may be disturbed by forestry operations. On the basis of LP's commitments of consulting botanists and the Conservation Data Centre (CDC) in the training of forestry technicians and the refinement of the Pre-harvest Survey (PHS), impacts on rare and endangered flora and fauna are largely mitigable to acceptable levels (Sec 9.1.1.6.2, 1995 EIS).	Report and protect critical habitat for plant and animal species considered at risk, threatened or endangered in each area. (Sec 7.6.5.2.1, 20-Year FMP).	The addition of an intention to report detections of RTE species may lead to increased crosschecking of surveys by experts in the field. For example, reporting locations of cavity nesting bird activity may lead to future visits to monitor nest activity success and thereby provide feedback on harvest activity impacts.	Addition of "…*report* and…" wording to proposed strategy.	**Neutral**	Forestry technicians' consistency in data collection, identification and monitoring skills may be improved by the act of reporting detections of RTE species.
Indicator Species Objectives	Indicator Species	The use of Indicator species is not discussed in the 10-Year FMP.		The Objective to manage wildlife habitat biodiversity at a coarse-filter or landscape level is supported in LP's 20-Year FMP by the intent to maintain the representation of the current range of wildlife habitat associations. This objective includes the use of LP bird monitoring data with selected bird species as indicators of forest biodiversity (Sec. 4.3.1.2, 20-Year FMP).	The use of indicator species, as it relates to Fish and Wildlife Objectives, will likely reflect LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity in the 20-Year FMP study area. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site.	The 10-Year Plan did not include the use of indicator species to monitor biodiversity. The addition of this objective in the 20-Year Plans raises some concerns about the appropriate use of avian indicator species. However, the incorporation of this monitoring program is indicative of LP's interest in developing an FMP that maintains biodiversity in the Plan area.	**Positive**	The incorporation of an Objective that includes landscape-level biological monitoring is a positive addition to the 20-Year FMP. As an Objective, LP's intent to conduct this level of monitoring is commendable. Research to ground truth relationships between indicator species and other wildlife taxa are in progress (Sec 8.1.2.8, 20-Year FMP). Publication of these results in Company and scientific literature will substantiate the implementation of this Strategy..
Management Strategies								
Ecological Strategies								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Biodiversity Strategies	Biodiversity Strategies	Although the 10- year FMP does not specifically list Biodiversity Strategies, it does identify and commit to biodiversity principles including - an ecological approach to management, -development decisions that reflect ecological, economic, social and cultural values, - and the conservation of biodiversity and sustainable use of biological resources (Sec 7.2, 10-Year FMP)	Except for the potential for loss of genetic diversity as a result of softwood tree planting, residual effects of LP's biodiversity strategies or principles are not discussed in the 1995 EIS.	The 20-Year FMP lists seven Strategies to achieve LP's Objective of maintaining ecosystem health and function. Generally, these Strategies include maintenance of representation and function of species composition, structure, and pattern in the forest; conservation of ecosystem condition and forest productivity; and conservation of rare ecosites and areas of high biodiversity (Sec 7.1, 20-Year FMP).	These strategies reflect LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity in the 20-year FMP study area. Residual impacts of strategies in the 20-Year FMP are dependent on related activities that take place in the study site.	Although the 20-yr FMP restricts its discussion of genetic diversity to protection of understory in its description of Ecological Strategies, it does acknowledge the Plan's general objectives for conserving biodiversity (Sec 4.3, 20-Year FMP) and in the Planning SOG as part the FML Agreement (Sec. 7.6.2.3).	**Neutral - Positive**	Research and monitoring efforts undertaken by LP have added complexity and depth to the Company's plan for management and conservation of genetic and species diversity in the FMA. The 20-Year FMP has re-organized how and where this issue is addressed in the Plan without making substantial changes to implementation or intent.
Forest Connectivity Strategies	Forest Connectivity	Although Forest Connectivity is not discussed as an Ecological Strategy in the 10-Year FMP, it is discussed in Fish and Wildlife Strategies, Corridors and Critical Areas, under "Maintenance of corridors and protection of seasonal habitat".		Although Forest Connectivity is not discussed as an Ecological Strategy in the 20-Year FMP, it is discussed in Fish and Wildlife Strategies, Corridors and Critical Areas, under "Maintenance of corridors and protection of seasonal habitat".		NA	NA	
Ecological Integrity Strategies	Ecological Integrity	See Ecological Biodiversity Strategies above		The 20-Year FMP lists seven Strategies to achieve LP's Objective of maintaining ecosystem health and function. Of these seven, two specifically refer to integrity as it relates to the landscape design incorporated into the FMP: - maintenance of the current range of ecosystem groups and associated forest species composition, - and maintenance of the existing range of forest structure, i.e. age class diversity conditions (Sec 7.1.1.1, Sec 7.1.1.2, 20-Year FMP). Also see Ecological Biodiversity Strategies above	These strategies reflect LP's commitment to conduct forestry practices in a manner that maintains the integrity of the landscape design present in the 20-year FMP study area. Residual impacts of strategies in the 20-Year FMP are dependent on related activities that take place in the study site.	Although the 20-yr FMP restricts its discussion of genetic diversity to protection of understory in its description of Ecological Strategies, it does acknowledge the Plan's general objectives for conserving biodiversity (Sec 4.3, 20-Year FMP) and in the Planning SOG as part the FML Agreement (Sec. 7.6.2.3).	**Neutral - Positive**	Research and monitoring efforts undertaken by LP have added complexity and depth to the Company's plan for management and conservation of genetic and species diversity in the FMA. The 20-Year FMP has re-organized how and where this issue is addressed in the Plan without making substantial changes to implementation or intent.
Timber Supply Strategies								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Timber Supply Sustainability Strategies	Supply of timber	Generally scenarios were modeled for the maximum sustainable harvest, LP's projected harvest, and the provincial Annual Allowable Cut (ACC) (Sec 8, Sec 3.4.2, 10-Year FMP). LP's projected harvest is based on their Oriented Strand Board (OSB) mill requirements for hardwoods and current quota holders' requirements for softwoods. Given these levels and requirements, the Harvest Schedule Generator (HSG) model projected that: - in FMU10, for a period of 100 years, the hardwood harvest on crown and private lands is sustainable at provincial AAC levels - in FMU11, for a period of 100 years, the hardwood and softwood harvest on crown and private lands is sustainable at provincial AAC levels - in FMU13, for a period of 100 years, the hardwood harvest on crown and private lands is sustainable at provincial AAC levels. Due to the present distribution of softwood age classes and the assumptions used in the model, the softwood AAC made need to be reviewed once a new inventory has been taken to ensure long-terms sustainability of the resource. (Sec 7.1.5, 10-Year FMP)	On the basis of analyses conducted using the FRI (1982), sustainability of LP's proposed level of hardwood harvest in FMU 10 was considered highly probable, and probable in FMU11. While sustainability of proposed hardwood levels in FMU13 was highly probable, it was concluded that sustainability of softwoods was uncertain. It was noted that the use of the 14 year old FRI added uncertainty to all three of these evaluations (Sec 8.3.2.1, 1995 EIS).	Strategies relevant to timber supply include "maintain the existing range of forest structure conditions over the long term" and "maintain a functional landscape pattern of forest cover and habitat types consistent with the principles of natural disturbance emulation" (Sections 7.1.1.2 and 7.1.1.3, 20-Year FMP).	Will provide clearer understanding of continued maintenance of boreal forest ecosystems; takes an ecosystem approach instead of a "harvest" approach and provides for future sustainability.	20-Year plan discusses "boreal forest ecology" not just forest stand sustainability as in the 10-Year plan.	**Positive**	Aside from details provided in discussions of Sustainable Forest Management (HSG model, ACC, OSB mill requirements) the 10-Yer FMP provides little in terms of operational strategies for Timber Supply. By comparison, the 20-Year FMP provides at least two strategies that relate specifically to how LP will manage forest resources to produce a sustainable timber supply. In addition to these strategies, the 20-Year FMP provides a detailed description of the scenario planning process (Sec 5, 20-Year FMP).

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Condition of timber	Much of the hardwood resource on the FML is in the mature to overmature age classes. Much of the wood in the younger age classes is in areas of recent fires. The softwood on FML#3 is also concentrated in the older age classes. However, there are also younger age classes resulting from recent fires or insect outbreaks (Sec. 8.1, 10-Year FMP).	Analyses conducted in the EIS suggest that most of the commercially important softwood and hardwood species may experience a dramatic reduction in availability or a need to reduce the AACs in the future for areas within the FML. This reduction in timber supply will result from an imbalance in the age classes, which are dominated by mature and overmature aspen stands. Essentially these areas will need to be cut in an accelerated manner, which will lead to an abundance of newly harvested stands. This cycle of harvestable volumes will need to be broken to ensure consistent levels of harvest volumes throughout an entire rotation period (Sec. 8.3.2.4, 1995 EIS).	Strategies include "maintain the range of representation of the current range of ecosystem groups and associated forest species composition" (Section 7.1.1.1, 20-Year FMP), and "Maintain the existing range of forest structure conditions over the long term" (Section 7.1.1.2, 20-Year FMP). The 20-Year FMP also notes that the priority of harvesting oldest aged trees first may be changed. According to research conducted in Permanent Sample Plots there is evidence that some forest types can increase hardwood volume and conifer volume as the stand ages through gap phase dynamics (Sec. 7.1.1.2, 20-Year FMP).	Emphasis on maintenance of forest ecosystem groups (ecosites) and forest structure over time may result in increased conservation of vegetation and wildlife species associated with more diverse forest ecosites. LP's interest in alternate harvest priorities that focus less on 'oldest first' techniques may allow the Company to conserve critical elements of the landscape and habitat types strongly associated with old forests.	An emphasis on harvest of old aged trees in the 10-Year Plan has shifted in the 20-Year FMP to an acknowledgment that old forests may be associated with habitats and a role in landscape design. The 20-Year FMP notes that LP is considering changes to the harvest schedule profile for FMU13.	**Positive**	Although LP recognizes that provincial AAC will impact harvest planning, consideration is being given to maintenance of mature stands present within the forest structure in FMU13. In light of the EIS conclusion that some change needed to be made to avoid foreseeable reductions in timber availability (related to accelerated harvest of mature trees), re-evaluation of condition and priority of timber in the 20-Year FMP seems appropriate.
Softwood/Hardwood/ Mixedwood Management Strategies	General Timber Management Strategies	Undertake forest management activities promoting reestablishment of similar forest stand to original forest cover through compliance with Forest Renewal Standards for Forest Regeneration in Manitoba (Sec. 5.2.4, 10-Year FMP).	The 1995 EIS predicts an increase in the area of younger age classes and a reduction of the older age classes in the Plan area (Sec. 12.2.5.1, 1995 EIS).	The strategy to "maintain the range of representation of the current range of ecosystem groups and associated forest species composition" is the management strategy for softwood, hardwood and mixed wood management (Sec 7.1.1.1, 20-Year FMP). In addition, the 20-Year Plan will "maintain the existing range of forest structure conditions over the long term" (Section 7.1.1.2, 20-Year FMP).	In general, the process of harvesting returns the forest to an earlier age class. This is beneficial to species that prefer younger forests but adverse for species that use mature forests. Emphasis on maintenance of forest ecosystem groups (ecosites) and forest structure over time may result in increased conservation of vegetation and wildlife species associated with more diverse forest ecosites	A new determination of the Annual Allowable Cut was available for the 20-Year FMP. A new Forest Resource Inventory has been generated for FMU 13 and was available for the 20-Year FMP.	**Neutral - Positive**	The use of the new AAC in determining harvest volumes is expected to prevent adverse effects related to forest sustainability. The availability of a new Forest Resource Inventory for FMU 13 will also help meet this strategy, however the updated Forest Resource Inventory for the other FMU is not available.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Hardwood Management Strategies	Increased harvest of cutting classes 4 and 5 to balance age class distribution of forest (Sec 5.2.3, 10-Year FMP).	Proposed harvest levels outlined in the 10-Year FMP are sustainable for 100 years. Adequate flexibility exists for hardwood harvest to allow for volume losses (due to wildlife, insect, or disease damage), and source withdrawals (natural spaces, treaty lands, etc) without affecting sustainability of proposed harvest options (Sec 12.2.5.2, 1995 EIS).	The strategy to "maintain the range of representation of the current range of ecosystem groups and associated forest species composition" is the management strategy for softwood, hardwood and mixed wood management (Section 7.1.1.1 20-Year FMP).	The implementation of this strategy will increase the likelihood that harvested areas will be regenerated to a similar species composition. However, over time harvesting will return the forest to an earlier age class structure.	The hardwood management strategies stated in the 20-Year FMP are similar to those used in the 10-Year FMP.	Neutral	The 20-Year FMP has re-organized how and where this hardwood management is addressed in the Plan without making substantial changes to implementation or intent.
	Softwood Management Strategies	Larger presence of younger component (cutting classes 0 to 2) due to fire and natural disturbance - AAC for softwoods based on current age class structure (Sec 5.2.3, 10-Year FMP).	The 1995 EIS found proposed harvest levels for softwoods marginally sustainable for the next 100 years due to softwood volumes in FMU11 being underutilized, potentially unsustainable long-term (100 years) softwood harvest in FMU13, and marginal flexibility to allow for volume loss and area withdrawals. In addition, it was concluded that need for artificial regeneration of softwoods may result in long-term loos of softwood related biodiversity (Sec 12.2.5.3, 1995 EIS).	The strategy to "maintain the range of representation of the current range of ecosystem groups and associated forest species composition" is the management strategy for softwood, hardwood and mixed wood management (Section 7.1.1.1 20-Year FMP).	The implementation of this strategy will increase the likelihood that harvested areas will be regenerated to a similar species composition, however, over time harvesting will return the forest to an earlier age class structure.	The softwood management strategies stated in the 20-Year FMP are similar to those used in the 10-Year FMP. The updated Annual Allowable Cut has been used in the 20-Year FMP.	Neutral	The 20-Year FMP has re-organized how and where this softwood management is addressed in the Plan without making substantial changes to implementation or intent. LP continues to apply the provincial AAC in harvest planning and practices.
Fibre Priorities Strategies		Since hardwood is collected as fibre for LP's OSB mill, see discussion of Hardwood Management Strategies above.	See above	Since hardwood is collected as fibre for LP's OSB mill, see discussion of Hardwood Management Strategies above.	See above	See above	Neutral	Discussion of Fibre priorities (management) in both the 10 and 20-Year Plans is covered under Hardwood Management strategies, which have essentially not changed between the two plans.
Harvest Priorities Strategies	Harvesting	Since softwood is harvested with the distinction of being used for timber products other then fibre, discussion of softwood management can be found in Softwood Management Strategies above.	See above	Since softwood is harvested with the distinction of being used for timber products other then fibre, discussion of softwood management can be found in Softwood Management Strategies above.	See above	See above	Neutral	Discussion of Harvest Priorities (management) in both the 10 and 20-Year Plans is covered under Softwood Management strategies, which have essentially not changed between the two plans.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
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Forest Renewal Management Strategy	Forest Renewal	Renewal prescriptions will be made for each harvest area prior to harvest (Sec 5.2.4, 10-Year FMP). Renewal strategies include surveys, scarification, site preparation, natural suckering, planting, "plus" trees, seed orchards and cones, mechanical and chemical thinning (Sec 5.2.4, 10-Year FMP). For more detail, see Silviculture Strategies below.	In general, the harvest procedures outlined in the SOPs and the AOPs have potential to result in minimal disruption of soil and surface vegetation on cutblocks (Sec 9.1.1.5.3, 1995 EIS). Harvesting hardwood forests will eventually result in the regeneration of similar hardwood species. Appropriate scarification methods can result in a more receptive seedbed for conifer species. Under certain conditions, re-establishment of a softwood forest may require manual re-seeding or re-planting. If LP is successful in maintaining a component of conifer in the understory of hardwood stands, then it is likely that the conifer component of these stands will increase over time, creating more of a mixedwood forest (Sec 9.1.1.5.2, 1995 EIS).	Several strategies in the 20-Year FMP pertain to forest renewal including; "Maintain the representation of the current range of ecosystem groups and associated forest species composition" (Sec 7.1.1.1, 20-Year FMP), "Maintain the existing range of forest structure conditions over the long-term" (Sec 7.1.1.2, 20-Year FMP), "Maintain a functional landscape pattern of forest cover and habitat types, consistent with the principles of natural disturbance emulation" (Section 7.1.1.3), "Maintain forest productivity by ensuring prompt forest renewal" (Sec 7.1.1.6, 20-Year FMP).	In recognition of the importance of prompt forest renewal, LP has incorporated this practice into the FMP. Pre- and post-harvest surveys create a system of harvest prescription and effects monitoring that allow timely recognition and application of understory protection and regeneration practices on stand level (Sec. 7.1.1.6, 20-Year FMP). LP has also conducted research on harvest impacts on understory tree and herbaceous layers. These post harvest practices and application of knowledge gained in permanent plot studies will likely improve the ability to regenerate pre-harvest forest stands in a manner that further reduces residual impacts of forestry practices (Appendix 2.1, Sec 7.6.1.1, 20-Year FMP).	The 20-Year FMP has added strategies that focus on maintaining forest structure and species composition, while emphasizing prompt forest renewal. Research conducted to better understand harvest activity impacts on understory tree and herb species supports LP's methods and planning for regeneration strategies (Appendix 2.1, Sec 7.6.1.1, 20-Year FMP).	**Positive**	The 1995 EIS reported that the effect of regeneration strategies would be dependent on the speed with which regeneration occurs, and noted uncertainties related to a lack of information about understory regeneration in hardwood stands. In the 20-Year FMP, emphasis has been give to implementation of prompt renewal practices. In addition, research on understory herbaceous and tree species response to harvest and renewal efforts has taken place and seems to have been incorporated in forestry practices.
Utilization Standard Strategies		See discussion of Timber Supply Utilization Standard Objectives above.		See discussion of Timber Supply Utilization Standard Objectives above.		NA	NA	
Forest Protection Strategies								
Forest Health Strategies	General Forest Health	LP recognizes that Manitoba will provide forest protection services, and LP will submit an annual Fire Protection Plan as well as a plan for the protection and/or management of any known insect or disease problem on the FML3# area (Sec 9.8, 10-Year FMP).	Residual effects of LP's Forest Health Strategies are not discussed in the 1995 EIS.	The strategies used to maintain forest health depend upon identification of problem areas. Managers must strike a balance between pest and disease management and fibre sustainability. The focus of this strategy is the mitigation of pest and disease impacts in areas of concern (Sec. 7.1.1.7, 20-Year FMP).	This strategy reflects LP's commitment to manage the FMA in a manner that will likely reduce threats to forest health. Residual impacts of strategies in the 20-Year FMP are dependent on related activities that take place in the study site.	The inclusion of a Forest Health Strategy is an improvement to the 20-Year FMP. See discussion of strategy details below in Insects and Disease.	**Positive**	See discussion below in Insects and Disease.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

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Fire and Fuels Strategies	Fire and Fuel	In compliance with the *Forest Act*, the *Fire Prevention Act* and Regulations and in accordance with all agreements, plans and operating and work permits to the operation, fire-fighting equipment will be on site and in serviceable condition during active operating seasons, relative to the size of the operation. Accumulated slash will be minimized to reduce fire hazard (Sec 9.8-9, 10-Year FMP).	Residual effects of LP's Fire and Fuels Strategies are not discussed in the 1995 EIS.	In compliance with the *Forest Act*, the *Fire Prevention Act* and Regulations and in accordance with all agreements, plans and operating and work permits to the operation, fire fighting equipment will be on site and in serviceable condition during active operating seasons, relative to the size of the operation. According to government guidelines and where possible, a slash-free firebreak zone will be maintained within five meters of uncut stands and all exclusion zones with all felled trees removed from this zone and a predetermined acceptable level of accumulated debris on adjacent undisturbed forest floor (Sec. 7.6.1.7, 20-Year FMP).	Uncertainties regarding potential impacts of fire in harvested areas are not addressed.	The 20-Year FMP provides increased description of fire protection strategies, with attention to firebreak zones.	**Positive**	Not only does the 20-Year FMP include plans for fire break zones in the FMA, it notes that slash from the cleared area will not be indiscriminately heaped into adjacent areas.
Insect and Disease Strategies	Insect and Disease	LP and the Province share responsibility for managing insects and disease. They will develop strategies, standards and guidelines define how each party will work to control insects and disease. LP must file a plan by February 1 of each year outlining how the company proposes to protect the forest area and manage known insect or disease problems within FML#3 (Sec 8.3, 10-Year FMP)	Residual effects of LP's Insect and Disease Strategies are not discussed in the 1995 EIS.	See Forest Health Strategy description above. As it relates to pasts and disease, the Forest Health Strategy implements accelerated harvest operations in areas where disease may spread beyond stand boundaries (Sec 7.1.1.7, 20-Year FMP).	If the accelerated removal of diseased forest stands is successful in containing outbreaks of pests and disease, then this strategy for maintenance of forest health may reduce the threat of landscape level threats to forest health.	The 20-Year FMP includes new wording specifically designed to address a strategy for the maintenance of forest health.	**Positive**	Though this strategy is a positive addition to the 20-Year FMP, it seems fairly re-active. If practices described in the Standard Operating Guidelines (SOG) (Sec 7.6.3.6.2, 20-Year FMP) describe precautionary education and survey plans to achieve forest protection, then the FMP would have a more proactive strategic approach regarding forest health.

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Road Development and Access Management Strategies		Road management activities for road classes I, II, and III will be submitted on maps that will show the location for all existing and proposed roads for the AOP. The plan will outline the classes of roads and provide technical information such as right-of-way widths, grades, slopes, travel surface widths and general standards of construction. In addition, the plan will discuss road longevity, a road retirement proposal, proposed access control, and road closures.	The 1995 EIS notes that impacts to infiltration and flow of surface and subsurface water largely result from effects of forest roads. These changes in the hydrologic cycle last as long as a road is present. The EIS also notes that LP's AOPs and SOPs are particularly attentive to these potential adverse effects and include commitments to a variety of erosion prevention and sediment control measures. These commitments are the basis for the conclusion that mitigation measures can reduce potential adverse effects to acceptably low levels (9.1.1.7.3, 1995 EIS).	The strategy pertaining to roads is to "conserve ecosystem condition and productivity by limiting road length, duration and density."	This strategy is likely to reduce adverse effects noted in the 1995 EIS including those associated with road surface area and the length of time impermeable surfaces are active. In addition, this strategy is expected to reduce access-related hunting pressures and wildlife-vehicle collisions.	A commitment to reduce road length, duration and density has been added to the 20-Year FMP.	**Positive**	LP's intention to limit road duration and extent in the Plan area will address issues noted in the 1995 EIS and is expected to reduce adverse impacts associated with road construction and use in FMLA#3.
Silviculture								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Treatment and Retreatment Strategies	Treatment Strategies	Reforestation techniques and treatments will include: - in coniferous cutovers, planting healthy coniferous stock produced from seed collected in the local area - in deciduous cutovers regeneration will be encouraged by creating >60% ground exposure to sunlight except where understory conifers are present - in areas where topsoil is removed (landings, cleared areas, permanently abandoned roads), land will be regenerated to productive status - trees growing on fine-textured soils will be harvested in winter to prevent damage to root systems and reduction of suckering potential - cutblocks containing varied site conditions will be divided into different reforestation treatment areas, with silvicultural characteristics of managed species and site conditions dictating reforestation techniques - growth and yield of regenerated stands will be enhanced by controlling spatial distribution of crop trees and treating micro- and macro-environments for seedling establishment and growth (may involve herbicides) (Sec 9.9.5, 10-Year FMP).	Based on LP's commitment to ecosystem-based management principles, maintenance of biodiversity at stand- and landscape levels, forest renewal at all harvested sites and adherence to provincial guidelines in the Forest Act, it is predicted that hardwood stands will regenerate to hardwood, mixedwood stands will (dependent on understory protection) be reduced by aspen sucking, and softwood stands will (depending on hardwood component) regenerate to conifer dominated forest (Sec 9.1.1.5..2, 1995 EIS). Predictions of residual impacts on understory are dependent on application of silvicultural treatments. Understory in hardwood blocks is highly variable and no long-term conclusions can be made. On softwood blocks, understory will likely remain unchanged (Sec 9.1.1.5.3, 1995 EIS).	Harvested areas will be regenerated through the application of one or more of the following renewal strategies: - Hardwood dominant stands will be harvested via modified clearcut, with regeneration via natural suckering. Immature white spruce in the understory will be protected. - Pure or jack pine-dominant stands will be clearcut, with topping and limbing at the stump and scarification to encourage regeneration from natural seeding. Direct seeding or planting will be used as needed. - Mixedwood stands will be harvested via modified clearcut. Regeneration of spruce will occur via natural seeding from remnant seed trees (wildlife tree patches) with additional treatments including reduction of slash loading, exposure of mineral soil, retained woody debris as 'nurse logs', and planting of high quality seedlings soon after harvest - Black spruce dominant stands will be clearcut with natural regeneration from seed trees, followed by refill planting where needed (Sec 7.6.4.3.1-5. 20-Year FMP).	Plans for reforestation treatments in the 20-Year Plan incorporate understory protection and immediate manual planting, or monitoring for planting needs following harvest activities. LP has also conducted research on harvest impacts on understory tree and herbaceous layers. These post harvest practices and application of knowledge gained in permanent plot studies will likely improve LP's ability to implement harvest activities in a manner that further reduces residual impacts of forestry practices (Appendix 2.1, Sec 7.6.1.1, 20-Year FMP).	The 20-Year FMP has added more detail to descriptions of species-specific harvest techniques and treatments. Research conducted to better understand harvest activity impacts on understory tree and herb species supports LP's methods and planning for harvest techniques and regeneration strategies (Appendix 2.1, Sec 7.6.1.1, 20-Year FMP).	**Positive**	The 1995 EIS reported uncertainties related to a lack of information about understory regeneration in hardwood stands. LP was encouraged to increase understanding of harvest impacts and preservation techniques. Research to this end has taken place and seems to have been incorporated in forestry practices.
Reforestation Lag Period Strategies		See Reforestation Lag Period Objectives above.		NA		NA	NA	
Site Productivity Strategies		See Forest Renewal and Silvicultural Practices below.		NA		NA	NA	

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Reforestation Potential Strategies	Provincial Forest Renewal Strategies	Forest renewal practices will fulfil LP's obligations with respect to Manitoba's Sustainable Development Strategy for Forests. A combination of forest renewal methods will ensure that renewed forests have the same species composition and makeup as the stands that were harvested. Stocking standards determined by the Province will be incorporated into the FMP (Sec 8.2, 10-Year FMP).	Harvesting hardwood forests will eventually result in the regeneration of similar hardwood species. Appropriate scarification methods can result in a more receptive seedbed for conifer species. Under certain conditions, re-establishment of a softwood forest may require manual re-seeding or re-planting. If LP is successful in maintaining a component of conifer in the understory of hardwood stands, then it is likely that the conifer component of these stands will increase over time, creating more of a mixedwood forest (Sec 9.1.1.5.2, 1995 EIS). While regeneration of mixedwood forest stands is underway, those wildlife species (birds, mammals, amphibians, etc) that require older aged stands and related characteristics (greater canopy cover; tree cavities; cool, moist microclimate etc) will likely be displaced from the area.	LP's reforestation strategy is to reforest harvested ecosystems to their original tree species composition. This will be achieved at the landscape level, through silvicultural systems and treatments, which balance the ecology of the forest and the silvics of the tree species (Sec 7.6.4.2, 20-Year FMP). Similar strategies employed in the 10-Year FMP resulted in Certificates of Reforestation for all hardwood, softwood and mixedwood plots harvested during 1995-2005 (Sec. 2.1.16.4, 20-Year FMP).	LP's 20-Year FMP reforestation strategy emphasises a return of harvested areas to stands with similar species composition. This is congruent with the emphasis of the 10-Year FMP.	There is a reduced degree of reference to provincial standards and strategies in the 20-Year FMP description of general renewal strategies. Despite this omission and different wording, there seems to be no real change in intent.	Neutral	LP's intent to carry out reforestation strategies on a landscape level may improve the potential of these strategies to reverse residual effects of harvest activities.
	Regeneration Preparation Strategies	To encourage establishment of suitable regeneration on deciduous cutovers, LP will strive to achieve more than 60 % ground exposure to sunlight unless understory is present (Sec 9.9.5, 10-Year FMP).	Information is scarce regarding the post-harvest regenerative abilities of understory species that grow under specific soil, nutrient, moisture, and light conditions found in the study area. Though declines in species richness have been observed in Manitoba boreal communities in the year following harvest disturbance, impacts on both understory and overstory community diversity vary. Due to this high degree of variability in understory response to harvest practices, no conclusion on FMP impacts can be made (Sec 9.1.1.5.3, 1995 EIS).	See Site Productivity Scarification Strategies below.		NA	NA	

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Regeneration Strategies	Trees growing on fine textured soils will be harvested in winter to prevent damaging the suckering potential of root systems (Sec 9.9.5, 10-Year FMP).	In general, the harvest procedures outlined in the SOPs and the AOPs have potential to result in minimal disruption of soil and surface vegetation on cutblocks (Sec 9.1.1.5.3, 1995 EIS).	If forest renewal standards cannot be met because of fragile conditions of a site, such as fine textured soils, wet organic sites and steep slopes, then harvesting will be modified or prohibited on the site (Sec 7.6.4.15, , 20-Year FMP). Also see Fragile Conditions Conservation under Environmental and Ecosystem Maintenance below.	Residual effects of harvest activities in fragile conditions may be avoided by implementing these practices.	Although the 20-Year FMP omits information specifying alternate seasonal harvest schedules for fragile site conditions, it states that harvest practices will be modified or prohibited where fragile conditions occur.	**Neutral**	LP's modification of harvest activities based on site fragility will likely result in the impact to the fragile site being minimized by either seasonal or mechanical modification to harvest activity.
	Regeneration Strategies	Silvicultural characteristics of the managed species and the site conditions will dictate the reforestation techniques (Sec 9.9.5, 10-Year FMP).	The 1995 EIS does not evaluate effects of this activity.	LP will implement a variety of silvicultural systems with reliance on natural regeneration processes. This strategy has been applied to various stand types utilizing clear-cut, modified clear-cut, understory preservation, suckering, natural reseeding and planting (Sec. 7.6.4.3, 20-Year FMP).	If renewal proceeds as described by LP, regeneration of pre-harvest stand conditions may alleviate residual effects of harvest activities by replacing clearcuts with tree species composition similar to pr-harvest conditions. .	There is more stand-specific description of harvest strategy and stand regeneration planning described in the 20 year FMP.	**Positive**	The effect of regeneration strategies in both the 10- and 20-Year FMP is dependent on the speed with which regeneration occurs and the success of reforestation to pre-harvest stand conditions. In the long-term, regeneration strategies will likely reverse residual effects of harvest activities.
Growing Stock Strategies	Regeneration strategies	Plant healthy coniferous stock produced from seed harvested from the local area, when such stock is available (Sec 9.9.5, 10-Year FMP).	LP plans to assist with collection of seed from the local area and plant healthy coniferous stock produced from this seed. While these actions will minimize impacts on the regions softwood genetic pool, a minor long-term impact to genetic diversity has potential to occur (Sec 9.1.1.5.4, 1995 EIS).	LP collects seed from within FML 3, with collections of softwood species occurring during bumper-crop years. Seed inventories will be stored at Pineland Forest Nursery (Sec 7.6.4.5, 20-Year FMP). Additionally, LP is committed "To provide long-term harvest availability". Long-term modeling aims to balance harvest-related reductions in growing stock with increased growing stock resulting from silvicultural treatments (Sec 7.1.2.6, 20-Year FMP).	Although seedling growth strategies in the 20-Year FMP are not substantially different from those in the 10-Year FMP, the 20-Year FMP describes LP's Tree Improvement (see Forest Renewal Methods & Activities below), goals to capture genetic diversity in regeneration seedlings. If the products of the Tree Improvement Program are implemented into Growing Stock Strategies, then this may address uncertainties regarding loss of genetic diversity in renewal activities.	No substantial change in seedling growth strategies in the 20-Year FMP. However, use of Tree Improvement Program may contribute to genetic diversity of seedlings used for renewal purposes, in which case uncertainties about genetic diversity may be addressed. In addition, LP has collaborated with Halifax University researchers who have found that (Rajora 200 in press) diversity artificially regenerated (planting) and naturally regenerated (following fire disturbance) black spruce stands.	**Neutral - Positive**	If the stock from the Tree Improvement Program is incorporated in forestry renewal efforts, then genetic diversity captured in this Program may contribute to genetic diversity in tree populations within the study area.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
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	Snow Cached Seedlings	In sites with seasonal accessibility, seedlings are snow cached for summer planting by private contractors (Sec 5.2.4, 1995 EIS).	Not addressed in the 1995 EIS.	Overwintered stock is required due to access limitations to plant blocks within many of the harvested areas. Significant numbers of seedlings are cached every February because of this constraint (Sec 7.6.4.6, 20-Year FMP).	If accessing sites during winter reduces road-related impacts, then activity associated with snow caching seedlings will likely minimize residual effects associated with re-seeding.	None	**Neutral**	No change has been made to language or intent from the 10- to 20-Year FMP.
Establishment Period Strategies		This topic is not discussed as a Strategy In the 10-Year FMP. See Reforestation Lag Period Objectives above.		This topic is not discussed as a Strategy in the 20-Year FMP. See instead Tree Planting under Forest Renewal Methods and Activities, below.		NA	NA	
Greenup Period Strategies	Greenup Strategies	"Green-up" as a Strategy for mediating harvest practices near recently clearcut blocks, is not discussed in the 10-Year FMP.	Impacts of "Green-up" strategies are not discussed in the 1995 EIS.	Consistent with the historic natural temporal and spatial distribution of natural openings, a "green up" of at least 2 meters in softwood and 3 meters in hardwood at the desired level of stocking will be required before adjacent areas may be harvested (Sec 7.6.6, 20-Year FMP).	By delaying harvest activities on land adjacent to pre-existing clearcuts until reforestation is well established, residual impacts associated with large clearances of land (i.e. increased ungulate mortality due to hunting activities, wildlife avoidance of large openings in the canopy, soil and hydrological impacts) will likely be reduced.	Description of "Green-up" Strategy in the 20-Year FMP is an improvement over the 10-Year Plan, which does not discuss the concept of mimicking natural disturbances temporally or spatially.	**Positive**	This positive rating reflects the substantial evidence that LP is invested in ecologically-based forest management. However, attempts to mimic natural disturbances with clearcut and modified clearcut forestry will need to be tested on a long-term scale to access the success of these practices.
Growth Rates Free-to-Grow Strategies	Free-to-grow standards and surveys	At the time the 10-Year FMP was developed, free-to-grow standards were being developed by MC to measure progress of a regenerating stand to its free-to-grow deadline. LP has stated its intent to incorporate these provincial standards into its silvicultural practices (Sec 9.9.10, 10-Year FMP).	Impacts of "free-to-grow" strategies are not discussed in the 1995 EIS.	Free-to-grow (FTG) standards have been developed by MC for black and white spruce and jack pine. LP surveyors will be responsible for conducting FTG surveys following provincial protocols and methodologies within FML#3. All forest regeneration survey data will be entered into a digital database and forwarded to MC (Sec 7.6.4.12, 20-Year FMP).	Compliance with provincial free-to-grow standards will likely increase chances of successful forest renewal in harvested areas.	MC has provided and LP has incorporated provincial free-to-grow standards into the FMP silvicultural practices.	**Positive**	It is assumed that LP's compliance with provincial standards will result in successful regeneration of harvested stands.
Water Strategies								

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Water Quality Strategies	Water Quality	Harvest strategies relating to water quality include felling trees away from water, removing slash and debris as it accumulates, use of harvest methods that maintain root systems at spring and water sources, and restriction of heavy machinery in areas with springs or water sources (Sec. 9.3.5, 10-Year FMP). Road construction and use strategies relating to water quality include: locating roads on stable soil and away from water source areas; use of natural benches, moderate slopes, and ridges to reduce road cuts and fills; avoiding diversion of ditches into streams; storage of debris to eliminate chance of it entering a stream and elimination of debris by agreed upon methods (Sec 9.6.3, 10-Year FMP).	Implementation of these strategies is expected to reduce adverse effects related to water quality (Sec. 9.1.1.4.2, Sec 9.1.1.7.3-7 1995 EIS).	Harvest strategies relating to water quality include felling trees away from water, removing slash and debris as it accumulates, use of harvest methods that maintain root systems at spring and water sources, and restriction of heavy machinery in areas with springs or water sources Sec. 7.6.1.2.1.2, 20-Year FMP). Road construction and use strategies relating to water quality include: locating roads on stable soil and away from water source areas; use of natural benches, moderate slopes, and ridges to reduce road cuts and fills; avoiding diversion of ditches into streams; storage of debris to eliminate chance of it entering a stream (Sec 7.6.2.6, 20-Year FMP) LP has also committed to limit harvest disturbances within sub basins to that no more than 30% of watershed as suggested by the Department of Fisheries and Oceans (Sec 7.1.2.2, 20-Year FMP).	These strategies are expected to reduce adverse effects related to water quality.	Language describing Water Quality Strategies have essentially remained the same from the 10- to the 20-Year FMP. However, LP has made a new commitment to a limit for cumulative harvests within watersheds of not greater than 30%. This is a substantial amendment to the Harvest Strategies of the 10-Year FMP.	Neutral - Positive	The 20-Year FMP has re-organized how and where Water Quality Strategies are addressed in the Plan without making substantial changes to implementation or intent. LP's commitment to limit harvest disturbance to 30% within sub-basins falls under the Company's Implementation Objective to 'provide goods and services to present and future generations'. This overarching Objective effects a positive change on LP's harvest-related impacts on water quality.

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Erosion Strategies	Erosion Control	Harvest Strategies to reduce erosion generally relate to buffers around water bodies and include no disturbance or removal of timber within 60 meters of the high water mark. In the case of intermittent or ephemeral streams and beaver floods, buffer types and width vary according to soils and wildlife habitat present (Sec. 9.3.5, 10-Year FMP). Operational Strategies to reduce erosion related to road construction and use include: avoiding construction of roads/trails within 100m of high water marks for any permanent stream or within 30m of an intermittent stream/spring; storing soil apart from logging debris to be used for road and bared land reclamation; avoidance of road construction/borrow pits in buffer zones; and retain slash and woody debris for soil erosion control (Sec. 9.6.3, 10-Year FMP).	Adherence to the practices stated in the Standard Operating Procedures is expected to reduce erosion (Sec. 9.1.1.7.3, 1995 EIS).	Erosion control measures include spreading slash and debris along Right-of-Ways (ROW), silt fence establishment, placement of rip rap, construction of cross ditches and check dams to channel runoff, and biotechnical methods such as the use of matting, straw mulch, or planting of native tress and shrubs. When required, detailed deactivation plans are submitted to MC and the Department of Fisheries and Oceans (DFO) for review (Sec 7.2.11, 20-Year FMP). The use of pipe bundles reduces the need for roads to be created in some temporary access locations. (Sec 7.2.11, 7.2.12, 8.3, 20-Year FMP).	Continued adherence to erosion control practices as well as application of new techniques as they become available is expected to reduce erosion at road crossings and other disturbances.	The use of pipe bundles for temporary stream crossings is a water crossing method new to the 20-Year FMP. Otherwise, practices stated in the two plans are similar, with the addition of detailed description of erosion control measures.	**Positive**	The addition of new stream crossing techniques is an improvement in road-building and harvest activities and reflects LP's commitment to continued conservation of riparian and aquatic habitats.
Siltation Strategies	Siltation Control	See Erosion Control Strategies above. For more information also see Water Quality Objectives and Strategies above.	Adherence to the practices stated in the Standard Operating Procedures was expected to reduce siltation (Sec. 9.1.1.7.3, 1995 EIS).	Erosion and sediment control measures are implemented at all stages of construction and are applied to varying degrees depending on characteristics of the site. See descriptions of control measures in Water Quality and Erosion Control Strategies above.	These practices are expected to continue to reduce impacts on fish passage and fish-bearing streams.	Although descriptions have been reorganized and appear under somewhat different headings, strategies for sediment control have not changed substantially between the 10- and 20-Year FMP.	**Neutral**	The 20-Year FMP has re-organized how and where this issue is addressed in the Plan without making substantial changes to implementation or intent.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
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Fish Passage Strategies		For Harvest Strategies designed to reduce impact on Fish Passage, see Erosion Control Strategies above. Strategies to reduce impacts of road construction and use on fish passage include: designing stream crossings to handle flood volumes with an historical frequency of 1 in 50 years; bridge abutments and culverts will not restrict stream flow or impinge on stream channel; stream crossings will be designed for upstream and downstream movement of fish year round; bridges or open-bottomed culverts will be used preferentially, especially where fish passage and sedimentation is a concern (Sec. 9.6.3, 10-Year FMP). In addition, LP will take action to remain knowledgeable about and participation in programs assessing presence of fish species and ensure culverts do not block passage for spawning (Sec 8.6, 10-Year FMP).	These practices and LP's commitments to accord with the 1994 Draft Stream Crossing Guidelines were expected to minimize effects on fish passage (Sec 9.1.1.7.7, 1995 EIS).	Work associated with the installation of culverts and bridges will be timed to avoid fish migration, spawning, and incubation periods All watercourse crossings will conform to the Manitoba Stream Crossing Guidelines for Protection of Fish and Fish Habitat, and Recommended Procedures for Protecting Fish Habitat in Lakes and Streams in Forest Cutting Areas (Sec. 7.6.2.8.3, 20-Year FMP) The use of pipe bundles in the construction of water crossings and for site preparation is a new strategy used to reduce impacts of water crossings on fish-bearing streams. (Sec. 7.2. 11-12, Sec. 8.3 20-Year FMP).	These strategies and related practices are expected to continue to reduce impacts on fish passage and fish-bearing streams.	The 20-Year FMP has added intent to restrict water-crossing activities during times of critical fish activity, conformance with fish-related provincial guidelines, and the implementation of pipe bundles.	**Positive**	The addition of timed water-crossing activity and new stream crossing techniques is an improvement in LP's continued commitment to conservation of fish communities and habitat.
Flooding Strategies		Harvest Strategies to reduce flood impacts in cutover areas are described above in Water Quality and Erosion Control Strategies. Stream crossings for all-weather roads will be designed to accommodate flood volumes, which have an historical frequency on average of 1 in 50 years (Sec 9.6.2, 10-Year FMP).	Although the 1995 EIS does not specifically mention impacts of harvest and road construction on flood potential, it does discuss expected impacts associated with road these activities on stream morphology, erosion and siltation, with the conclusion that LP's SOP's, AOPs, wise use of buffers and compliance with provincial Guidelines are expected to reduce impacts to acceptable levels (Sec. 9.1.1.4.2, Sec 9.1.1.7.3-7 1995 EIS).	To maintain passage for natural surface and stream flow regimes, water crossings will be designed for class I and II roads to handle flood volumes, which have an average historical flood frequency of 1 in 100 years. Bridge abutments or culverts will not restrict stream flow or impinge on stream channel (Sec. 7.6.2.6, 20-Year FMP).	These practices are expected to reduce instances of flood damage in the Plan area.	The standard for flood protection for stream crossings has been raised and is discussed further in Road Development, Access Management, and Other Infrastructure Development below.	**Positive**	The EIS of the 10-Year plan was not able to determine effects on biodiversity due to insufficient available information. Constructing more robust water crossings to withstand 1-in-100 year flood events rather than 1-in-50-year will reduce erosion and thus improve quality of fish habitat in the event of flood events. There are also associated socio-economic effects, such as road crossings that can withstand more extreme weather will reduce loss of time due to road repairs.
Fish and Wildlife Strategies								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Habitat Strategies	Leave areas.	To provide diversity, 'leave areas' will be retained, within which logging operations will be minimized (Sec 9.2.4.1, 10-Year FMP).	On the basis of LP's commitment to retain leave areas that buffer riparian habitat (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS), and maintain areas of mature and over-mature forest, residual effects of harvest activities may be reduced. However, as a result of forestry operations, marten, cavity nesters, area-sensitive species, and neotropical migrant birds in general will likely experience reductions in habitat availability and increased risk of predation. (Sec 9.1.1.6.1-2. 1995 EIS). Insufficient information is available to evaluate harvest activity impacts on amphibian, reptile, and invertebrate communities in the study area or to predict benefits of minimally logged leave areas.(Sec 9.1.1.6.3, 1995 EIS).	An aggregation of wildlife trees must be retained in patches of varying sizes across the cutblock. Patches in larger blocks will be retained to provide habitat diversity. To maximize the effect of these leave areas, activities associated with logging operations will be kept to a minimum. (Sec. 7.6.5.2.4, 20-Year FMP).	Retention of aggregate wildlife trees may increase structural diversity of leave areas, improve habitat availability, and increase landscape connectivity for wildlife moving through the harvest area.	Descriptions of aggregate and dispersed retention of wildlife trees have been added, with the goal of maintaining connectivity in post-harvest landscape. Ultimately, retention of trees in harvested areas is regulated by provincial Line-of-Sight requirements.	**Neutral**	Although LP has participated in studies of habitat fragmentation effects and has incorporated this and results of similar studies into future forest management practices, Provincial regulation relating to wildlife tree retention and Line-of-Sight requirements may curtail patch area proposed by LP for variable retention.
	Buffer design	Add or widen buffers, deferrals, etc., to provide more mature or over-mature habitats (Sec 9.4.1, 10-Year FMP).	The presence of residual softwood cover within the cutblock may be an important factor in determining moose utilization. Forestry Management Guidelines for Wildlife recommend 50% of cover in operations should be retained (Sec 9.1.1.6.1, 1995 EIS). Marten may make use of residual stands but stand size needs to be 15-30ha (Sec 9.1.1.6.1, 1995 EIS). Positive effects of retention of mature or overmature stands are dependent on the size of patches of mature habitat retained and their proximity to other patches or cutblock edges (Sec 9.1.1.6, 20-Year FMP).	Where present on larger cutblocks (> 10 ha), clumps of mature mixed deciduous and conifer species should be retained (Sec 7.6.5.2.4, 20-Year FMP).	On larger cutblocks, retained clumps of mixedwood species may reduce residual effects of harvest activities.	The 20-Year FMP exchanges use of words "buffers" and "deferrals" for the use of the word "clumps", which is defined as equivalent to a "patch". Clump size to be implemented in cutblocks larger than 10 ha will be determined by Provincial Line-of-Sight requirements.	**Neutral**	The 20-Year FMP has made minor changes to language regarding how this issue is addressed in the Plan without making substantial changes to implementation or intent.

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Leave areas.	Small merchantable stands surrounded on at least three sides by meadow, shrub land, or water bodies may be left as cover or mature forest cover (Sec 9.4.1, 10-Year FMP).	The presence of residual softwood cover within the cutblock may be an important factor in determining moose utilization. Forestry Management Guidelines for Wildlife (MC) recommend 50% of cover in operations should be retained (Sec 9.1.1.6.1, 1995 EIS). Marten may make use of residual stands but stand size needs to be 15-30ha (Sec 9.1.1.6.1, 1995 EIS). Reduction in availability of suitable nest trees for cavity nesters may be mitigated if "Island habitats' are left in each cutblock. It has also been noted that birds using smaller habitat patches experience higher predation (Sec 9.1.1.6.2, 1995 EIS). Moose, marten, and various bird species may be positively affected by retention of mature and over-mature buffers or deferrals. As this effect is dependent on the size of patches of mature habitat retained and their proximity to other patches or cutblock edges, it is likely that buffers surrounded on three sides by unharvested habitat will provide important habitat to wildlife. On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels. (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Small merchantable stands surrounded on at least three sides by meadow, shrub land, or water bodies may be left as cover or mature forest cover (Sec 7.6.5.2.4 , 20-Year FMP).	Retention of unharvested forest surrounded by sensitive habitat may reduce residual effects of harvest activity from nearby cutblocks.	None	Neutral	No change in wording or intent has occurred between the 10- and 20-Year FMP.

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		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Riparian Zone Strategies	Minimize disturbance at stream crossings.	Allow free and unobstructed fish passage through stream crossings without harmful delay (Sec 9.4.2, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Allow free and unobstructed fish passage through stream crossings without harmful delay (Sec. 7.6.5.4, 20-Year FMP). In addition, pipe bundles will be used to conduct water crossings to reduce impacts on riparian habitat and passage in fish bearing streams (Sec. 7.2.12, 20_Year FMP).	These practices will decrease chances that obstructions will delay fish passage in waterways within the FMA. .	Implementation of pipe bundles is a new addition to water crossing techniques described in the 20-Year FMP.	**Positive**	The use of new water crossing techniques will further reduce impacts of road access and site preparation in the Plan area.
	Minimize disturbance at stream crossings.	To minimize disturbance of critical fish habitat, protect stream bottom and banks from accelerated erosion (Sec 9.4.2, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	To minimize disturbance of fish and fish habitat, protect stream bottom and banks from accelerated erosion (Sec. 7.6.5.4, 20-Year FMP).	These practices will decrease chances that road construction and harvest activities may damage stream banks/bottom and increase erosion. .	None	**Neutral**	No change in wording or intent has occurred between the 10- and 20-Year FMP.
	Minimize disturbance at stream crossings.	Avoid introduction of hazardous construction materials or deleterious substances into the stream community (Sec 9.4.2, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Avoid introduction of hazardous construction materials or deleterious substances into the stream community (Sec. 7.6.5.4, 20-Year FMP).	These practices will decrease chances that deleterious substances will be deposited into waterways.	None	**Neutral**	No change in wording or intent has occurred between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP								
Objective, Strategy, Activity, or Procedure	**Details**	**10-Year FMP**		**20-Year FMP**		**Change in FMP**	**Change in Effect Due to Change in FMP (colour coded)**	**Comments**
		Proposed Practices	**Residual or Uncertain Effects**	**Proposed Practices**	**Residual or Uncertain Effects**			
	Protection of riparian areas.	Protect habitat diversity and any unique or seasonally critical habitat associated with riparian and aquatic areas (Sec 9.4.2, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Protect habitat diversity and any unique or seasonally critical habitat associated with riparian and aquatic areas. Prevent Harmful Alteration, Disruption or Destruction (HADD) of aquatic habitat (Sec. 7.6.5.4, 20-Year FMP).	These practices will decrease chances that harvest activities may affect protected waterways.	Addition of language regarding HADD with no functional change to FMP.	**Neutral**	No change in intent has occurred between the 10- and 20-Year FMP.
	Aquatic buffers	Depending on size of aquatic habitat and condition of timber, forested buffers will be retained around aquatic habitats (Sec 9.4.2, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Buffers will be retained along rivers, creeks, lakes, critical wildlife habitat (nests, mineral licks), and along specific roads. These buffers may be managed where condition of timber warrants and where approval is granted (Sec. 7.6.5.4, 20-Year FMP).	The ability of the FMP to minimize residual effects on waterfowl, caribou, marten, and neotropical migrant birds will be dependent on details of buffer zone implementation.	Addition of critical wildlife habitat and specific roads to language in 20-Year FMP.	**Positive**	The addition of buffer zones to critical wildlife habitat and to specific roads may reduce residual effects of harvest and access activities. At some point, more detail will be necessary regarding selection of 'specific roads' and additions/changes to buffers there.
	Aquatic buffers.	Standard buffer widths that do not protect enough critical riparian habitat will be widened as required for each site (Sec 9.4.2, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, barriers to fish movement, aspen leachate, and forestry chemicals can be mitigated to acceptable low levels (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	Standard buffer widths that do not protect enough critical riparian habitat will be widened as required for each site (Sec. 7.6.5.4, 20-Year FMP).	Hydrological (infiltration, runoff, erosion) systems and wildlife (waterfowl, Neotropical Migrant Birds, large game) species that are sensitive to reduced vegetative cover, increased edge habitat, reduced old-growth forest may experience less disturbance resulting from widened buffer widths.	None	**Neutral**	No change in wording or intent has occurred between the 10- and 20-Year FMP.
	Aquatic buffers.	Aquatic habitat includes the area up to the normal high water mark (Sec 9.4.2, 10-Year FMP).	None	Aquatic habitat includes the area up to the normal high water mark (Sec. 7.6.5.4, 20-Year FMP).	Riparian habitat should not be affected providing "high water mark" designations include flood planes associated inundated by variable seasonal flow.	None	**Neutral**	No change in wording or intent has occurred between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Escape Cover Strategies	Escape Cover Maintenance	Encourage wildlife use of cutblocks by reducing long unobstructed distances. Incorporating stand edges in cutblock boundaries is a strategy to consider. Cutblocks should be no wider than 400m and all points within a cutblock should be within 200m of cover (Sec 9.4.1, 10-Year FMP).	The presence of residual softwood cover within the cutblock may be an important factor in determining moose utilization. Forestry Management Guidelines for Wildlife (MC) recommend 50% of cover in operations should be retained (Sec 9.1.1.6.1, 1995 EIS). Marten may make use of residual stands but stand size needs to be 15-30ha (Sec 9.1.1.6.1, 1995 EIS). Reduction in availability of suitable nest trees for cavity nesters may be mitigated if "Island habitats' are left in each cutblock. It has also been noted that birds using smaller habitat patches experience higher predation (Sec 9.1.1.6.2, 1995 EIS). Moose, marten, and various bird species may be positively affected by retention of mature and over-mature buffers or deferrals. However, this affect is dependent on the size of patches of mature habitat retained and their proximity to other patches or cutblock edges.	Leave patches should be no more than 400 m apart or within 400 m of contiguous forest, thus designed to reduce long, unobstructed lines of sight. In addition, alignment of cutblock boundaries with stand edges should also be considered (Sec 7.6.5.2.4, 20-Year FMP).	The increase in distance between cutblock edge and patch edge from 200 to 400 meters will effectively increase the distance that wildlife traverse when moving from cover provided by the cutblock edge to cover provided by a patch.	The 20-Year FMP increases the distance that wildlife must cross from one area of cover to another.	**Negative** .	The 20-yr FMP doubles the effective width of a cutblock compared to the 10-yr FMP. Increasing distance between contiguous forest and patch increases distance to cover for game and for birds or mammals foraging or dispersing from natal ground.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Shelter Strategies	Cutblock design.	In cutblocks greater than 10 ha, four to five wildlife trees/ha will be left for snag retention. Wildlife trees will be greater than 25 cm dbh (Sec 9.4.1, 10-Year FMP).	The presence of residual softwood cover within the cutblock may be an important factor in determining moose utilization. Forestry Management Guidelines for Wildlife (MC) recommend 50% of cover in operations should be retained (Sec 9.1.1.6.1, 1995 EIS). Marten may make use of residual stands but stand size needs to be 15-30 ha (Sec 9.1.1.6.1, 1995 EIS). Reduction in availability of suitable nest trees for cavity nesters may be mitigated if "Island habitats' are left in each cutblock. It has also been noted that birds using smaller habitat patches experience higher predation (Sec 9.1.1.6.2, 1995 EIS). Moose, marten, and various bird species may be positively affected by retention of mature and over-mature buffers or deferrals. However, this affect is dependent on the size of patches of mature habitat retained and their proximity to other patches or cutblock edges.	In cutblocks larger than 10 ha, 8-12 trees/ha will be retained as wildlife trees. Wildlife trees will have a minimum dbh of 25 cm (or smaller if all trees are <25 cm). Retention of trees, over 45 cm dbh is encouraged. White birch trees alone are not adequate wildlife tree habitat provision. Maintenance of snags and wildlife trees will be promoted with the public, contractors, and Manitoba Workplace Safety and Health by LP staff. Where retention may be dangerous, snags will be topped at ~2.0-2.5 m (Sec. 7.6.5.2.4 , 20-Year FMP).	Post harvest survey data averaged across 19 cutblocks in 2004 shows that LP leaves many more trees than the number designated in the SOGs (Sec 8.1.1.5, 20-Year FMP). This retention of cover is expected to reduce hunting pressure on ungulates, and increase cover available to wildlife moving through or living within harvest areas. l Encouraged selection of larger dbh wildlife trees may lead to a more mature age structure to leave areas in harvest areas.	In the 29-Year FMP, the number of wildlife trees retained has increased in comparison to the number of trees per hectare described in the 10-Year FMP. Commitment to snag maintenance is new, as are specified snag height measurements.	**Positive**	Post harvest survey data averaged across 19 cutblocks in 2004 shows that LP leaves many more trees than the number designated in the SOGs (Sec 8.1.1.5, 20-Year FMP). This retention of cover is expected to reduce hunting pressure on ungulates, and increase cover available to wildlife moving through or living within harvest areas.
	Distribution of slash.	Moderate amounts of slash will be dispersed in cutover (Sec 9.4.1, 10-Year FMP).	It has been noted that red-backed and meadow vole densities and masked and pygmy shrew densities increase following forest practices that include post-harvest slash dispersal (Sec 9.1.1.6.1, 1995 EIS). Thus, slash dispersal may have positive effects on small some mammal species and related benefits to predators on these small mammals. Due to the high degree of variability in understory response to harvest practices, no conclusion on residual effects of logging activities can be made (Sec 9.1.1.5.3, 1995 EIS).	Silvicultural practices that maintain abundant coarse woody debris are encouraged. To provide large pieces of decaying wood, trees are topped and limbed at the tree stump. In designated harvest blocks, small piles of tops and limbs and slash debris will be retained within block boundaries 50-100 m from dense softwood stands to provide habitat for small mammals and pine marten (Sec. 7.6.5.2.4, 20-Year FMP).	Species of small mammal and predators that prey on these species may experience an increase in available habitat and a reduction in harvest-related residual effects. Soil nutrients potentially lost by off-site limbing and topping may be retained more regularly in the cutblock.	20-Year FMP adds substantial description of 'slash' and 'coarse woody debris,' with emphasis on marten habitat requirements.	**Positive**	Possible reductions in soil nutrient loss, increases in small mammal habitat availability and related prey availability may follow the application of these silvicultural practices.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	General nest buffers.	General nest tree requirements include surrounding a large stick nest by an uncut buffer of 20 m with no harvesting within 100 m from April-June (Sec 9.4.1, 10-Year FMP).	Assuming that LP's Post-harvest Surveys provide data on presence and location of eagle activity with precision enough to enact a buffer system modeled after that implemented in the Chippewa National Forest, adverse impacts of harvest activities can be mitigated to acceptably low levels(Sec 9.1.1.6.2 , 1995 EIS).	General nest tree requirements include surrounding a raptor nest by an uncut buffer of 20 m (Sec. 7.6.5.3, 20-Year FMP).	LP's continued conservative practice of buffering eagle nests and compliance with the Environment Act License to minimize hardwood harvest activities during the avian breeding season will continue to mitigate forestry impacts on eagles nesting in the Plan area.	Although the language of the 20-Year FMP leaves out the requirement of no harvesting within 100 m of a non-specific raptor nest, LP's practice of no harvest from April-June (see AOPs) in adherence with the Environment Act, and to reduce fire risk and damage to roads effectively covers the 10-Year FMP stipulation of no harvesting within 100 m of a nest during the avian breeding season.	Neutral	Although wording has been changed in the 20-Year FMP, no substantive change in practice or intent has occurred.
	Eagle nest buffers.	Eagle nest requirements include surrounding a nest with an uncut buffer of 20 m; no timber harvesting within 100 m of the nest from April-August; minimal cutting within 100-200 m of the nest is permitted during the 'non-critical' period; all activities will be curtailed within 200-400 m of the nest from April-August; preserve potential nest/roost trees throughout cutblock (Sec 9.4.1, 10-Year FMP).	Assuming that LP's Post-harvest Surveys provide data on presence and location of eagle activity with precision enough to enact a buffer system modeled after that implemented in the Chippewa National Forest, adverse impacts of harvest activities can be mitigated to acceptably low levels (Sec 9.1.1.6.2, 1995 EIS).	Eagle nest requirements include surrounding a nest with an uncut buffer of 20 m; no timber harvesting within 100 m of the nest from April-August; minimal cutting within 100-200 m of the nest is permitted during the 'non-critical' period; all activities will be curtailed within 200-400 m of the nest from April-August; preserve potential nest/roost trees throughout cutblock (Sec 7.6.5.3.1, 20-Year FMP).	Buffer zones provided for eagle nests will likely mitigate residual effects of harvest activity.	None	Neutral	No change in wording or intent has occurred between the 10- and 20-Year FMP.
	Heron colony buffers.	For heron colonies, the above restrictions apply from the edge of the colony (Sec 9.4.1, 10-Year FMP).	Great blue herons have been know to relocate colonies following destruction or alteration of their habitat during the non-breeding season. In general, heron response to any disturbance is highly variable. Mitigation restricting all forestry activities to autumn or winter and/or to areas beyond a critical distance from nests can be effective in reducing disturbance to this species. On the basis of the measures to avoid existing rookeries as outlined in LP's FMP, and in heronries during PHS, the potential for significant adverse effects on herons can be mitigated to acceptably low levels (Sec 9.1.1.6.2, 1995 EIS).	For heron colonies, the above restrictions apply from the edge of the colony (Sec. 7.6.5.3.2, 20-Year FMP).	Buffer zones provided for heron colonies will likely mitigate residual effects of harvest activity.	None	Neutral	No change in wording or intent has occurred between the 10- and 20-Year FMP. It may or may not be appropriate to apply buffer zones and timing restrictions on harvest activity to heron colonies based a model developed for nesting eagles in Chippewa National forest. LP needs to provide follow-up data on the results of this management practice.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Corridors and Critical Areas Strategies	Maintenance of corridors and protection of seasonal habitat.	Retain forested corridors for wildlife movement between various seasonally used habitats (Section 9.4.1, 10-Year FMP).	The spatial arrangement of patches of habitat in consideration with their size, shape, degree of isolation or linkage, and their context in a larger mosaic of habitats, may have substantial influences on community structure. The structure of an entire landscape mosaic, rather than the size or shape of individual patches, is most important to wildlife. The likelihood that wildlife dispersal can occur between fragments and forestall the extirpation of sensitive species on a regional scale is influenced by the configuration of the fragments and the land mosaic in which they are imbedded. In the study area, the agricultural cultivation of the former grasslands in the lowlands between the Duck Mountains and other forests in the surrounding region has confined wildlife movements between forests into corridors between fragments (Sec 9.1.1.6, 1995 EIS). Thus, the inclusion in LP's FMP of corridor maintenance among cutblocks will likely reduce adverse effects of forestry practices in the study area.	During planning, cutblock design will ensure forested corridors are retained for wildlife movement between various seasonably used habitats (See also strategies for Specialized and Unique Habitat below) (Sec. 7.6.5.5 , 20-Year FMP).	Maintenance of forested corridors may alleviate residual effects of harvest activities, especially for those species that require large uninterrupted areas of mature or old-growth forest during critical seasonal movements or activities.	Addition of wording pertaining to scheduling of plans for retained corridors.	**Positive**	Additional wording indicates that corridors will be set aside prior to harvest activities rather than after prime forest stands have been removed.
	Timing of logging operations.	Where logging operations are conducted near sensitive areas or seasonal habitat used for calving, denning or winter feeding, attempts will be made to harvest at times that do not coincide with seasonal activities (Section 9.4.1, 10-Year FMP).	LP's commitment to conducting post harvest surveys enables the FMP to comply with the protection measures for unique areas (calving sites, salt licks, meadows, etc) outlined in the guidelines (Forestry Management Guidelines for Wildlife in Manitoba) (Sec 12.1.23.4, 1995 EIS).	Where logging operations are conducted near sensitive areas, attempts will be made to harvest at times that do not coincide with seasonal wildlife activities (Sec 7.6.5.5, 20-Year FMP).	Species covered by wildlife management practices and that are seasonally sensitive to disturbance may experience reduced residual effects of harvest activities that coincide with migration, breeding, nesting, etc.	None	**Neutral**	No change in wording or intent has occurred between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Harvest area exclusions.	Habitats including calving sites, mineral licks, caves, remnant prairies, etc., will be excluded from harvest blocks by moving boundaries or by buffering in accordance with Forest Management Guidelines for Wildlife in Manitoba (Section 9.4.3, 10-Year FMP).	LP's commitment to conducting post harvest surveys enables the FMP to comply with the protection measures for unique areas (calving sites, salt licks, meadows, etc) outlined in the guidelines (Forestry Management Guidelines for Wildlife in Manitoba) (Sec 12.1.23.4, 1995 EIS). The presence of residual softwood cover within the cutblock may be an important factor in determining moose utilization. Forestry Management Guidelines for Wildlife (MC) recommend 50% of cover in operations should be retained (Sec 9.1.1.6.1, 1995 EIS). Marten may make use of residual stands but stand size needs to be 15-30ha (Sec 9.1.1.6.1, 1995 EIS). Reduction in availability of suitable nest trees for cavity nesters may be mitigated if "Island habitats' are left in each cutblock. It has also been noted that birds using smaller habitat patches experience higher predation (Sec 9.1.1.6.2, 1995 EIS). Moose, marten, and various bird species may be positively affected by retention of mature and overmature buffers or deferrals. However, this affect is dependent on the size of patches of mature habitat retained and their proximity to other patches or cutblock edges.	Habitats including calving sites, mineral licks, caves, remnant prairies, etc will be excluded from harvest blocks by moving boundaries or by buffering in accordance with Forest Management Guidelines for Wildlife in Manitoba (Sec. 7.6.5.5 , 20-Year FMP).	Retention of unharvested forest surrounding sensitive habitat may reduce residual effects of harvest activity from nearby cutblocks.	None	Neutral	No change in wording or intent has occurred between the 10- and 20-Year FMP.
Access Strategies		Discussion of this issue can be found under Road Development, Access Management, etc., below.		Discussion of this issue can be found under Road Development, Access Management, etc., below.		NA	NA	

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Vulnerable, Threatened, and Endangered Species Strategies	RTE species management.	Any plant or animal species or plant communities listed under the *Endangered Species Act* or COSEWIC as endangered, threatened or at risk and identified in FML #3 will be protected by exclusion zones (Sec 9.4.4, 10-Year FMP).	Floral and Faunal RTE Species: Uncertainties related to continuity of forestry technicians and consistency in skill level regarding data collection, identification and monitoring of RTE species are not addressed (Sec 12.2.10, 1995 EIS).	Any plant or animal species or plant communities listed under the *Endangered Species Act* or COSEWIC as endangered, threatened or at risk and identified in FML #3 will be reported and protected by exclusion zones (Sec. 7.6.5.6, 20-Year FMP).	The addition of an intention to report detections of RTE species may lead to increased crosschecking of surveys by governmental experts in the field, but is essentially an addition of wording alone.	The addition of stipulation that RTE organisms will be reported is a minor change in wording.	**Neutral - Positive**	Forestry technicians' consistency in data collection, identification and monitoring skills may be improved by the act of reporting detections of RTE species.
I0ndicator Species Strategies		Strategies for monitoring Indicator species are not mentioned in the 10-Year FMP.		The Strategy to manage wildlife habitat biodiversity at a coarse-filter or landscape level is supported in LP's 20-Year FMP by plans to maintain representation of the current range of wildlife habitat associations. This strategy includes the use of LP bird monitoring data with selected bird species as indicators of forest biodiversity (Sec 4.3.1.2, 20-Year FMP).	The use of indicator species, as it relates to Fish and Wildlife Strategies, will likely reflect LP's commitment to conduct forestry practices in a manner that maintains and protects biodiversity in the 20-Year FMP study area. Residual impacts of objectives in the 20-Year FMP are dependent on related activities that take place in the study site.	Indicator species were not included in the 10-Year Plan to manage the FMA to maintain biodiversity. The addition of this strategy in the 20-Year Plans raises some concerns about the appropriate use of avian indicator species. However, the incorporation of this monitoring program is indicative of LP's interest in developing an FMP that maintains biodiversity in the study FMA.	**Positive**	The incorporation of a Strategy that includes landscape-level biological monitoring is a positive addition to the 20-Year FMP. As a Strategy, LP's intent to conduct this level of monitoring is commendable. Still, details on methods and conclusions drawn from using birds as indicators of habitat requirements for all wildlife species in the study area need more support from scientific literature.
Forest Development Activities								
Harvest Operations								
Projected Forest Structure		A younger proposed forest structure was expected to result from the removal of stands of mature and overmature timber.	The harvesting was expected to result in a younger forest over time. Effects on biodiversity could not be determined due to insufficient information (Sec 8.3, 1995 EIS).	The future forest structure was determined using a model that used a coarse-filter framework to link general forest structure to biodiversity conservation (Section 4.3, 20-Year FMP).	The incorporation of biodiversity considerations into the forest planning process is likely to prevent adverse effects on loss of biodiversity, although the extent of this effect has not been determined.	The coarse filter approach for conserving biodiversity during forestry planning and operations has added a landscape-level focus to the Plan's maintenance of forest structure. .	**Positive**	The incorporation of biodiversity conservation into the forest-planning model is likely to reduce effects on biodiversity.
Annual Wood Requirements		The annual wood requirements were to be specified in the Annual Operating Plans.	No residuals effects were identified.	The annual wood requirements were to be specified in the Annual Operating Plans.	No residuals effects were identified.	No changes were identified.	**Neutral**	
Proposed Operating Areas and Projected Schedule		The proposed operating areas were determined for using a GIS-based system, which was used to allow the public to give their input into the FMP. Public concerns relating to the plan addressed by changing harvesting boundaries etc.	The residual effects relate to those that occur as a result of harvest such as changes in forest age class and an increase in edge habitat. Some residual effects, such as the effects on biodiversity, could not be determined (Sec 8.3 and Sec 9.1.1.9, 1995 EIS).	The proposed operating areas in the 20-Year FMP were generated using a computer model that incorporated several constraints, including constraints to reduce environmental effects (Section 5, 20-Year FMP).	Many of the residual effects, such as those related to biodiversity, have been reduced and prevented by incorporating the consideration of environmental constraints into the generation of the 20-Year FMP. Residual effects related to harvesting are still expected to occur.	The ability to incorporate multiple constraints into the planning process through the use of a computer model is a new feature of the 20-Year FMP.	**Positive**	The incorporation of environmental considerations into the planning process is likely to reduce environmental effects.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Projected Annual Harvest Volume		Projected annual harvest volume was based on the Annual Allowable Cut.	There are no direct residual environmental effects associated with the projected annual harvest volume. Indirect effects related to the act of harvesting are expected to continue to occur (Sec 9.1.1.9, 1995 EIS).	A harvest volume control parameter was incorporated into the Patchworks forest-planning model (Section 5.2.13, 20-Year FMP). The harvest volume is based on the updated Annual Allowable Cut.	There are no changes in the direct residual environmental effects associated with the projected annual harvest volume. Indirect effects related to the act of harvesting are expected to continue to occur.	The planning model used during the formation of the 20-Year FMP incorporates the AAC along with considerations of other constraints.	**Positive**	The ability to consider environmental constraints in the model, along with harvest volumes is likely to reduce adverse environmental effects.
Harvesting Methods (clear-cut, strip-cut, CLAG, etc.)	Topping and limbing	Conducted at the stump or landing area; Tops and limbs will be spread over cutover unless otherwise specified (Section 9.7, 10-Year FMP).	Minimal impact and associated changes in soil nutrient loss (Sec 9.1.1.3.1, 1995 EIS).	Tops and limbs spread over cutover, unless otherwise specified (Section 7, 20-Year FMP, SOG – Forest Operations).	Leaving the tops and limbs is expected to minimize loss of soil nutrients, thereby preserving forest productivity.	Location where limbing and topping conducted not specified in 20-Year plan.	**Neutral**	
	Logging debris	Will be contained within cutblock – not pushed into standing timber (Section 9.7, 10-Year FMP).	Minimal impact and associated changes in soil nutrient loss (Sec 9.1.1.3.1, 1995 EIS).	Contained within cutblock boundaries - not pushed into standing timber (Section 7, 20-Year FMP, SOG – Forest Operations). LP has cooperated with researchers to produce a Slash Loading Guidebook for LP operators and staff (Section 2.1.6, 20-Year FMP).	The current practices are likely to minimized loss of soil nutrients and forest productivity.	The standard operating guidelines are the same in both plans, but a Slash Loading Guidebook has been generated for the 20-Year FMP.	**Positive**	The addition of a guidebook with specific practices stated is likely to further reduce environmental effects, by ensuring that the contractor is aware of the environmental protection practices that must be followed.
	Harvest and removal	Performed in accordance to FML agreement (unless required for wildlife habitat as determined jointly by Manitoba Natural Resources and LP); harvest ops will be progressive, logical and continuous; potential for return to harvest hardwood assessed within five years of harvest; areas of regeneration, high decay, wind damage will not be considered for harvest (Section 9.7, 10-Year FMP).	Minimal impact and associated changes in soil nutrient loss (Sec 9.1.1.3.1, 1995 EIS); shift/alteration to younger age class distribution. TetrES concluded that existing ecosystem not sustainable under "no harvest" scenario regardless of logging (Sec 8.3 and Sec 9.1.1.9, 1995 EIS).	Conducted to minimize soil disturbance, erosion and sedimentation to watercourses; stabilization and revegetation concurrent with operations of bared surfaces and unstable fill if directly associated with a stream; stabilization and revegetation within one year for other situations (Section 7, 20-Year FMP, SOG – Forest Operations).	The stated practices are expected to minimize residual environmental effects associated with harvesting and removal, such as soil nutrient loss, erosion and sedimentation.	No mention of silviculture; no areas of non-consideration of harvest such as regeneration areas and areas of wind damage; specific standards and guidelines provided for operating beside watercourses.	**Positive**	The addition of specific standards for operating beside watercourses is likely to further minimize adverse effects on the aquatic environment.
	Final clearance – slash abatement, cleanup, and reclamation work resulting from operations	Conducted in accordance with Timber Harvesting Practices for Forestry Operations in Manitoba (Section 9.7, 10-Year plan).	The proposed practices were likely to eliminate or reduce soil nutrient loss, erosion, and sedimentation (Sec 9.1.1.3.1, 1995 EIS).	Completed prior to moving to another operating area; will obtain final harvest block inspection from Manitoba Conservation. LP has cooperated with researchers to produce a Slash Loading Guidebook for LP operators and staff (Section 2.1.6, 20-Year FMP).	The practices in the Slash Loading Guidebook have been based on research into minimizing the environmental effects and maximizing forest renewal.	Completed before moving operations in 20-Year plan; final harvest block inspection. The use of the Slash Loading Guidebook has been added to the 20-Year FMP.	**Positive**	The addition of a guidebook with specific practices stated is likely to further reduce environmental effects, by ensuring that the contractor is aware of the environmental protection practices that must be followed.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
	Unknown/Unmapped Watercourses	No specific practices are stated, however, unknown or unmapped watercourses would likely be identified during the pre-harvest survey process and appropriate environmental protection practices such as stream crossing types, stated in the cutblock silvicultural prescription.	Residual effects to the aquatic environment were expected to be minimized through the pre-harvest survey and silvicultural prescription process (Sec 9.1.7.3-8, 1995 EIS).	Identified on block map and filed in block file (Section 7, 20-Year FMP, SOG – Forest Operations). Pre-harvest surveys continue to be conducted on each cutblock and used to generate cutblock prescriptions. Stream crossing assessments are also conducted.	Residual effects to the aquatic environment are likely to be minimized through these practices.	The practice of conducting stream-crossing assessments was not outlined in the 10-Year FMP, but this process was begun during the period covered by this plan and continues in the 20-Year FMP.	**Neutral - Positive**	The addition of the stream-crossing assessment process is likely to minimize or prevent effects on the aquatic environment.
Understory Protection Approaches	Understory Protection	Identification and preservation of sensitive features and plan for selective and less invasive cutblock design. Retaining buffers along roads and critical habitat. This method of maintaining existing softwood understory is beneficial to the forest. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Classification of watercourses, and careful planning of crossings (Section 9.3.6).	The maintenance of existing understories is beneficial to wildlife by providing habitat and cover immediately following harvesting. This practice also protects soil from desiccation and erosion (sec 9.1.1.5.3, 1995 EIS).	Understory protection practices and retention of habitat equivalent to that conserved by CLAAG have been incorporated into 20-Year FMP SOGs (Sec 7.1.1.6, 20-Year FMP).Also see descriptions of Understory Protection in Forest Renewal/Silvicultural Practices below.	Understory protection practices are expected to provide the same mitigative potential as CLAAG practices did in the 10-Year FMP.	Activities designed to protect understories in the 20-Year FMP are more developed and specific to veg-type. In addition, understory protection has been incorporated into overarching strategies to be generally implemented in the 20-Year FMP.	**Positive**	
Estimate of Volume by Species and Product		Volume classifications were determined based on the then-current Annual Allowable Cut (Sections 2.1 and 2.2, 10-Year FMP).	The new volumes calculated have been based on a new calculation of the Annual Allowable Cut.	Volume targets were based on the new Annual Allowable Cut recently determined by the Province of Manitoba (Section 5.7.7, 20-Year FMP).	No direct environmental effects identified. The residual effects are those associated with harvesting.	The new volumes calculated have been based on a new calculation of the Annual Allowable Cut.	**Neutral**	LP continues to be in compliance with Provincially determined AAC calculations.
Road Development, Access Management, and Other Infrastructure Development								

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Development Corridors for All-Weather and Main Winter Access Roads	Construction of roads	Maintaining water-quality and aquatic environments by permitting passage of surface and stream flows, permitting fish passage, and preventing deposition of slash, debris and dirt into aquatic environments Specific operating conditions and type of harvest equipment used planned to be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Keeping lines of sight <1km so as to reduce hunting and predation pressure. Maintaining unique and critical habitats, by identifying, avoiding, and buffering certain areas.	These practices were expected to mitigate adverse effects of road construction on erosion and sedimentation, hunting and predation pressures and unique and critical habitats. Remaining residual effects of road construction included increased edge habitat leading to adverse effects on bird species preferring deep forest habitats.	Maintaining water-quality and aquatic environments by permitting passage of surface and stream flows, permitting fish passage, and preventing deposition of slash, debris and dirt into aquatic environments Specific operating conditions and type of harvest equipment used planned to be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Keeping lines of sight <1 km so as to reduce hunting and predation pressure. Maintaining unique and critical habitats, by identifying, avoiding, and buffering certain areas. Maintaining terrestrial and aquatic biodiversity. Protecting Traditional and cultural resources. (Section 7, 20-Year FMP, SOG – Biodiversity).	The addition of commitments to maintain biodiversity and is likely to result in a positive effect on aquatic and terrestrial flora and fauna and on heritage resources. More effort is required to quantify the extent of these positive effects.	The activities described in the 20-Year FMP are similar to those described in the 10-Year FMP with the addition of commitments to maintain biodiversity and protect traditional and cultural resources.	**Positive**	The EIS of the 10-Year plan was not able to determine effects on biodiversity due to insufficient available information. The enhanced commitment to preserving biodiversity and the incorporation of biodiversity considerations into planning are positive. Increased attention to traditional and cultural resources is expected to have positive effects. No other changes in effects are anticipated.
Route Selection Rationale and Alternatives Considered		Submitting maps of proposed road locations early in the process. Roads must meet standards for intended use, based on road classification. Minor modifications and alterations made only with approval of IRMT. Harvesting merchantable timber on ROW before construction.	Residual effects of roads included increased mortality via increased hunting, long-term visual impacts and increased edge habitat. Some increase in erosion and changes in runoff and infiltration were expected to occur but be mitigated through adherence to SOPs.	Considering topography, location and types of watercourses and wetlands, proximity to lakes and unique features, critical wildlife habitat, existing roads and trails, cultural features, protected area, number of cutblocks to be accessed, season of use and other users. Roads must meet standards for intended use, based on road classification. (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures). The 20-Year FMP describes a road network transportation model used for road siting. The model is used to generate “candidate” road sites and identify cost and connectivity information and road density.	The intention to consider topography, location and types of watercourses, etc. is likely to further reduce residual effects of erosion and change in runoff and infiltration.	The 10-Year FMP does not require consideration of existing conditions for route selection but does require IRMT approval. The 20-Year FMP has omitted language to this effect because the approval process is incorporated in the IRMT permitting process. .	**Positive**	The change in wording suggests that effort will be made to alter road locations based on pre-existing conditions rather than simply siting roads wherever desired as is suggested by the wording of the 10-Year FMP. Incorporating existing conditions into road planning will likely have a positive effect. Since permits issued by the IRMT include road approvals, the absence of description of this approval is not included in the 20-Year FMP. he removal of the statement "with approval of IRMT"

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		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Road Construction Standards and Practices (related to borrow pits, brush disposal, and ROW widths)		Following road construction standards as laid out in the management plan standard operating procedures.	The environmental effects pertaining to road construction included erosion, and changes in runoff and infiltration, however, these effects were mitigated by adherence to the SOPs.	Road construction standards will be met as laid out in the management plan standard operating guidelines (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures). Best Management Practice training on water crossing activities is attended by LP operators, contractors and woodlands personnel. In 2005, LP underwent an independent third party audit to evaluate the Company's compliance with Sustainable Forest Initiative (SFI) standards. During this evaluation, particular note was made of exceptional practices including bi-yearly visits to all active stream crossings and a Heritage Compliance Program to meet the 1985 provincial Heritage Resources Act that is the first of its kind in Manitoba.	The effects as a result of the 20-Year are expected to be the same as stated in the EIS of the 10-Year plan.	The addition of attendance to Best Management Practice (BMP) training and the successful completion of an independent third party audit for the 2005-2009 Sustainable Forest Initiative (SFI) standards were additions to the 20-Year FMP.	**Positive**	Changes include attendance to BMP training in road construction and compliance with SFI standards for 2005-2009
Road Access Management		No direct mention.	The effect of increased hunting due to increased road access was noted as an effect of roads in the EIS of the 10-Year FMP.	Minimizing or closing access to protect wildlife and habitat depending on the nature and timing of use. Controlling access where road condition may be negatively affected by uncontrolled public use. Rehabilitating roads upon permanent abandonment. Barricading temporarily abandoned roads and removing water crossing and drainage structures. (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures).	This activity is expected reduce hunting mortalities. It will also reduce erosion and sedimentation and thus reduce effects on the aquatic environment.	This entire section is new in the 20-Year FMP, no mention of managing outside access along logging roads is discussed within the 10-Year FMP.	**Positive**	Any move to restrict access on logging roads and trails by the public will have positive affects on flora and fauna by facilitating regrowth, minimizing wildlife-vehicle collisions, and lowering potential for hunter and trapper use of the area. Restricting access will also help to reduce disturbance caused by vehicular traffic and human presence.

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Road Maintenance and Road Reclamation/Retirement	Operation/ maintenance of roads	Maintaining water-quality and aquatic environments by permitting passage of surface and stream flows, permitting fish passage, and preventing deposition of slash, debris and dirt into aquatic environments. Specific operating conditions and type of harvest equipment used planned to be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Keeping lines of sight <1 km so as to reduce hunting and predation pressure. Building water crossings to 1-in-50-year flood standards. Maintaining unique and critical habitats, by identifying, avoiding, and buffering. Decommissioning after no longer needed.	The environmental effects of roads were identified as pertaining to changes in runoff and infiltration and increased hunting pressures due to increased access.	Maintaining water-quality and aquatic environments by permitting passage of surface and stream flows, permitting fish passage, and preventing deposition of slash, debris and dirt into aquatic environments. Specific operating conditions and type of harvest equipment used planned to be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Keeping lines of sight <1 km so as to reduce hunting and predation pressure. Maintaining unique and critical habitats, by identifying, avoiding, and buffering. Decommissioning after no longer needed. Maintain biodiversity in terrestrial and aquatic environments Building water crossings to 1-in-100-year flood standards. Protecting traditional and cultural resources. Minimizing loss of productive forest land by stabilizing ditches and banks with vegetation, and placing sufficient slash on decommissioned roads and crossings (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures). The Annual Operating Plans include an Access Management Plan that specifies details on road type, construction and decommissioning including requirements for preventing sedimentation and erosion.	The added commitment to maintain biodiversity is likely to have a positive effect on flora and fauna. Constructing water crossings to 1-in-100 year standards is expected to improve the quality of fish habitat during flood events. Protection of traditional and cultural resources will mitigate potential adverse effects on heritage resources. Stabilizing ditches and banks will have a positive effect on the aquatic environment by further reducing erosion and sedimentation. Placing slash on decommissioned roads reduces access, thus reducing hunting in the area.	Reference to maintaining biodiversity, protecting traditional and cultural resources and minimizing loss of productive forest land have all been added to the procedures stated in the 20-Year FMP. Additionally, the level of flood protection required in the 20-Year FMP has increased from protection for a 1-in-50-year flood to protection for a 1-in-100-year flood.	**Positive**	The EIS of the 10-Year plan was not able to determine effects on biodiversity due to insufficient available information. The enhanced commitment to preserving biodiversity and the incorporation of biodiversity conservation into the 20-Year FMP is positive. Attention to minimizing the loss of productive forest is also positive. The methods listed for achieving this goal will also reduce erosion and reduce access, resulting in reduced effects on water quality and wildlife. Making a conscious effort to preserve traditional and cultural resources will reduce effects on heritage resources. Constructing more robust water crossings to withstand 1-in-100-year flood events rather than 1-in-50-year will reduce erosion and thus improve quality of fish habitat in the event of flood events. There are also associated socio-economic effects, such as road crossings that can withstand more extreme weather will reduce loss of time due to road repairs.

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	Decommissioning of roads	Decommissioning after no longer needed. Done by removing watercourse and drainage structures, cross-ditches, decompaction of soils, rollback of retained debris and topsoil, and revegetation.	Decommissioning of roads had the potential to result in erosion, however, this could be mitigated by adherence to the SOPs. Decommissioning of roads that were no longer in use would likely eliminate any effects occurring as a result of hunters accessing the area.	Decommissioning after no longer needed. Removing watercourse and drainage structures, cross-ditches, decompacting soils, rolling back retained debris and topsoil, and revegetating. Minimizing loss of productive forest land by stabilizing ditches and banks with vegetation, and placing sufficient slash on decommissioned roads and crossings. (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures). Reference to maintaining biodiversity, protecting traditional and cultural resources and minimizing loss of productive forest land have all been added to the procedures stated in the 20-Year FMP. Additionally, the level of flood protection required in the 20-Year FMP has increased from protection for a 1-in-50-year flood to protection for a 1-in-100-year flood.	Most of the proposed practices will further reduce effects like erosion. The willingness to leave ATV access based on the need of the community may have an effect on wildlife mortality if hunters continue to access the area, but is likely to have positive socio-economic effects.	The requirements to stabilize ditches and banks with vegetation and place slash on decommissioned roads and crossings has been added to the 20-Year FMP. The reference to leaving ATV access has also been added to the 20-Year FMP.	Neutral - Positive	Stabilizing ditches and banks with vegetation will reduce slumping and erosion due to run-off, and is likely to reduce or prevent effects on water quality. Placing slash on decommissioned roads will aid in moisture retention, and protect natural and planted vegetation as it grows, thus aiding in the revegetative process (AWP1). Any move to restrict access on logging roads and trail by the public will have positive affects on flora and fauna by facilitating regrowth, minimizing wildlife-vehicle collisions, and lowering potential for hunter and trapper use of the area. Restricting access will also help to reduce disturbance caused by vehicular traffic and human presence. Leaving ATV access, based on community needs, is likely to have a positive socio-economic effect.
Wood Storage and Preserving Areas	Log Storage - Hardwoods (aspen, balsam poplar, white birch) – Creation of roundwood log storage sites (Section 9.7, 10-Year plan)	Log storage was to be performed in accordance with Manitoba Natural Resources permits. Storage areas to be short-term and dependent on road conditions and highway load limits and to be located on high ground. There was a practice of providing contractor payment on delivery to reduce need for log storage sites (Section 9.7, 10-Year FMP). See Harvest Operations, Hardwood Utilization.	The EIS noted that aspen can produce a leachate, which is toxic to fish. The potential for impacts associated with aspen storage were expected to be low since LP intended to minimize aspen storage. The impacts of aspen storage in the field could not be generally evaluated as the potential for effects to occur because of the significance of local factors to enhance or minimize risk (Sec 9.1.1.7.8, 1995 EIS).	The 20-Year FMP states that storage areas will be short-term and timber will be moved as soon as access conditions improve and highway load limits are removed with contractor payment on delivery. If and when storage sites are required on Crown land, Manitoba Conservation will be notified with site-specific information (Sec 7, 20-Year FMP).	The new stated practices do not change the conclusions reached in the assessment of the 10-Year FMP. LP will continue to provide storage site information to MC.	The 20-Year FMP indicates that LP will continue to notify MC of storage sites.	Neutral	Notification in place of permits could potentially create a situation in which storage sites are selected and utilized at inappropriate locations. This is of particular concern for storage of aspen. If it is the case that permit conditions will still be met, it should be stated as such.

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	Log Storage – non-merchantable trees (i.e., elm, maple, etc.).	No direct mention.	Effects of log storage of non-merchantable trees not addressed in EIS.	The 20-Year FMP states that non-merchantable trees are to be left standing where possible, skidded to roadside if felled in pre-determined block where it is likely they will be utilized by fuel wood users or left at stump where not utilized by fuel wood users (Sec 7.6.1.3.1.2, 20-Year FMP).	Felled non-merchantable timber left at stump is identified as "better for the site ecologically and more aesthetically pleasing" (Section 7, 20-Year FMP).	Activities described regarding utilization of non-merchantable timber is a new addition to the 20-Year FMP, not covered in the 10-Year Plan.	**Positive**	Leaving standing non-merchantable trees provides habitat for wildlife. If leaving them standing is not possible, bringing felled trees to landings allows access by fuelwood burners to ensure that wood is not wasted, and minimizes the impact on the rehabilitation of the cutblock if the wood users do not have to go into the cutblock to retrieve it. In both cases the effect will be positive. It is uncertain if this is a new practice as it is not mentioned in the 10-Year plan.
	Log Storage - Softwoods – Interim Log Storage	Softwood logs may be stored at various sites throughout the FML#3. Incidental softwoods will be cut along with hardwoods in LP's operations. Intermediate softwood log storage sites may be required from time to time before delivery of softwoods is made. Recent past practices have made use of log storage sites, which often serve as processing sites for chipping timber. Chips produced at these sites are hauled directly to the pulp mill, while remaining debris are burnt during winter months (Sec 9.7.2, 10-Year FMP).	No mention is made of this practice in the 1995 EIS.	Softwood logs may be stored at various sites throughout the FML#3. Incidental softwoods are harvested along with hardwoods in LP's operations. Intermediate log storage sites may be required from time to time before delivery of softwoods is made. Use of these sites for log storage is subject to MC approval following formal site-specific application (Sec 7.6.1.3.1.3, 20-Year FMP).	The 20-Year complies with the Environment Act License, which stipulates that, to avoid leachate contamination, hardwood will not be stockpiled near waterways. In this way, impacts of hardwood storage will likely be mitigated to acceptable low levels. Residual effects of interim softwood storage are unknown.	Although language in the20-Year regarding log storage has changed, LP continues to comply with the Environment Act License as it addresses hardwood log storage.	**Neutral**	Although wording has been changed in the 20-Year FMP, no substantive change in practice or intent has occurred.

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	Log Storage – Softwoods – Wood Chip Processing Sites	Performed in accordance with Manitoba Natural Resources permits; chipper debris burning (Section 9.7, 10-YearFMP)	No environmental effects of wood chip processing sites were identified.	Chipping sites serve as holding areas for timber as well as processing sites for chipping timber. Chipper debris will either be piled and burned at the roadside or spread onto the road network at a mean depth of 10cm. Spreading of debris onto specific roads may be denied if access is required for forest renewal activities, if the road existed before harvesting activities, or if the road may be used for future forestry activities in the area. . Use of these sites for chipper processing is subject to MC approval following formal site-specific application (Sec 7.6.1.3.1.4, 20-Year FMP).	Additional research from Alberta model forest indicates <10 cm depth has minimal negative impacts on short-term productivity of site. It will have a positive effect soil and vegetation by retaining soil moisture and protecting regrowth.	Provision for spreading debris on road network has been added to the guidelines in the 20-Year FMP.	**Positive**	Refraining from burning chipper debris will improve local air quality. Wood chip debris spread on roads will aid in retention of soil moisture, and protection of regrowth. It will also aid in improving soil quality by breaking down and returning nutrients to the soil (AWP1).
Forest Renewal Methods and Activities								
Site Preparation	Site Preparation	Site preparation will be undertaken on selected sites to encourage natural or assisted regeneration of harvested areas. Site preparation will involve mechanical methods in order to create suitable microsites for planting and/or seeding. The type of equipment will be determined by pre-harvest survey as well as post harvest assessment in order to ensure proper soil exposure is achieved (Sec 9.9, 10-Year FMP).	Effects of harvest practices on understory vegetation are variable. On softwood blocks, surface disruption, like scarification, could result in the substantial replacement of understory vegetation with an early successional community. On hardwood blocks, understory vegetation composition is highly variable and no long-term trends in understory communities can be made (Sec 9.1.1.5.3, 1995 EIS)	Site preparation will be undertaken on selected sites to encourage natural or assisted regeneration of harvested areas. Site preparation will involve mechanical methods in order to create suitable microsites for planting and/or seeding. The type of equipment will be determined by pre-harvest survey as well as post harvest assessment in order to ensure proper soil exposure is achieved (Sec 9.9, 10-Year FMP).	Plans for reforestation treatments in the 20-Year Plan incorporate understory protection and immediate manual planting, or monitoring for planting needs following harvest activities. LP has also conducted research on harvest impacts on understory tree and herbaceous layers. These post harvest practices and application of knowledge gained in permanent plot studies will likely improve LP's ability to implement harvest activities in a manner that further reduces residual impacts of forestry practices (Appendix 2.1, Sec 7.6.1.1, 20-Year FMP).	None	**Neutral**	No change in wording or intent has occurred between the 10- and 20-Year FMP.
Seed Collection		Seed Collection is not discussed as an Activity in the 10-Year FMP. See Instead discussion of Direct Seeding below, and Growing Stock Strategies including Regeneration and Snow Cached Seedling Strategies.		Seed Collection is not discussed as an Activity in the 20-Year FMP. See Instead discussion of Direct Seeding below, and Growing Stock Strategies including Regeneration and Snow Cached Seedling Strategies.		NA	NA	

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Planting	Tree Planting Activities	Forest renewal activities are generally undertaken within 1-2 years after timber removal. Under the FML Agreement, the province must provide LP with seedlings from cones collected by LP for reforestation on FML#3. Tree species planted are white and black spruce and jack pine. Seedlings are grown in containers or in nursery beds. In sites with seasonal accessibility, seedlings are snow cached for summer planting by private contractors (Sec. 5.2.4, 10-Year FMP).	Planting activities are not discussed in the 1995 EIS.	Spring tree planting will be conducted from mid-May until mid-June of each year when temperatures become warm and risk of frost low enough that planting can commence. Summer tree planting will be continued from mid-July until early August of each year (Sec. 7.6.4.9, 20-Year FMP).	Seasonally specific timing of planting may increase survival of seedlings in reforestation attempts and thereby speed re-growth of stands to minimize residual effects of harvest activities on hydrology and wildlife.	LP's intention to add a Spring planting schedule is a change from planting activities described in the 10-Year FMP. Aside from this addition of a Spring plant, yearly regeneration efforts continue in the FML#3.	**Neutral - Positive**	More detail could be added to include both annual and seasonal timing of renewal activities in the description of renewal objectives.
Direct Seeding	Seedling selection and stocking requirements	Under the FML agreement, the province must provide LP with seedlings for reforestation on FML#3, from cones LP collects from the local area. White and black spruce and jack pine seedlings are grown in containers in greenhouses or outdoor nursery beds and delivered as bare-root or container stock. In sites with seasonal accessibility, seedlings are snow cached for summer planting (Sec5.5.2.4, 10-Year FMP).	Maintaining genetic diversity among merchantable tree species within large forested areas is a concern that must be addressed if reseeding and replanting (as opposed to natural regeneration) is the method used for re-establishment of harvested species. LP's commitment to encouraging natural regeneration, cutblock planning, appropriate use of harvest equipment, harvest timing and seedbed preparation should minimize the quantity of artificial regeneration required. Though these actions will minimize impacts on the region's softwood genetic pool, a minor long-term impact to genetic diversity has potential to occur.	LP requires from 2-2.5 million black and white spruce and jack pine seedlings annually. LP and the province of Manitoba agreed to eliminate the use of bare-root stock types in 2001. Large stock types are requested for their ability to compete with other vegetation in mixedwood habitats, which reduces the need for herbicide use. LP is in the process of conducting stock trials aimed at determining which stock types are best suited for the sites being harvested (Sec 7.6.4.6, 20-Year FMP).	Although LP has stated that seedling stock will be selected for characteristics that indicate seedlings are healthy and of competitive size, ultimately any artificial selection process will lead to a loss in genetic diversity in seedling stock. LP's commitments to maintain genetic diversity of tree stock through understory protection and their tree improvement program (see below) will likely offset potential impacts of reduced genetic diversity in the re-planted softwood genetic pool.	LP has eliminated the use of bare-root seedlings for re-stocking efforts. The 20-Year FMP also makes note of the importance of maintaining genetic diversity in reforestation seedling stock.	**Positive**	LP's focus on maintaining genetic diversity through various measures in the 20-Year FMP is an improvement on a lack of information on this issue in the 10-Year FMP.

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Tending	Stand Tending	Spacing/thinning may be undertaken on some overstocked naturally regenerated stands or plantations. Manual thinning or use of herbicides will control competing vegetation in softwood plantations (Sec 9.9.7, 10-Year FMP).	Although the 1995 EIS does not specifically address effects of Stand Tending Activities, general impacts of tree species diversity is discussed. The use of mechanical or chemical intervention to slow down the growth of hardwoods will provide the softwood stands an opportunity to compete with faster-growing hardwoods and will likely contribute to LP's maintenance of biodiversity at the stand and landscape level in the FMA (Sec. 9.1.1.5.2, 1995 EIS).	Stand tending may be required in certain stands to ensure that regenerated stands have the opportunity to maximize growth potential. Manual thinning or use of herbicides will control competing vegetation in softwood plantations (Sec 7.6.4.14 20-Year FMP)	As long as tending activities and related use of chemicals takes place with appropriate timing to avoid seasonally sensitive wildlife activities (avian brooding, amphibian migrations to breeding ponds, etc) and within adequate distance from riparian habitat (buffers), residual impacts of stand tending will likely be reduced to negligible levels.	None	**Neutral**	No substantive change in wording or intent has occurred between the 10- and 20-Year FMP.
Tree Improvement	Tree Improvement Program	LP intends to be involved in the provincial conifer tree improvement program. The program objective is to develop genetically improved planting stock to increase the yield and quality of wood from plantations (Sec 11.2.1, 10-Year FMP).	LP plans to plant healthy coniferous stock produced from seed collected with LP's assistance from the local area. While these actions will minimize impacts on the regions softwood genetic pool, a minor long-term impact to genetic diversity has potential to occur (Sec 9.1.1.5.4, 1995 EIS).	The objective of LP's Tree Improvement Program is to provide quality tree seed from naturally occurring forest stands within the Mountain Breeding Zone for future reforestation activities in western Manitoba. LP has signed a Manitoba Tree Improvement Cooperative (MOU) Agreement, with the Province of Manitoba, which defines the cooperative's purpose, goals and objectives, structure, operating budgets, etc. (Sec 7.6.4.18, 20-Year FMP).	If overstory regeneration strategies in the 20-Year FMP are unchanged from the 10-Year FMP, then plans for regeneration of overstory will mitigate harvest practices with a net neutral effect. While these actions will minimize impacts on the regions softwood genetic pool, a minor long-term impact to genetic diversity has potential to occur (Sec 9.1.1.5.4, 1995 EIS).	Description of tree improvement goals and objectives of the 20-Year plan includes new language emphasizing LP's intention to collect 'genetically diverse' seed stock for forest regeneration.	**Positive**	LP has responded to residual effects of seed collection practices described in the 1995 EIS, and now notes that seed collection efforts will attempt to capture genetic diversity in their cooperative provincial tree improvement program.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Research and Resource Surveys	Regeneration Surveys	Regeneration surveys and plantation survival assessments will be undertaken by the seventh year following harvest, to assess the success of naturally regenerated areas and plantations. Surveys will be performed according to approved provincial methods and procedures. Surveys will assist in determining need for further silvicultural prescriptions and treatments. LP will implement these treatments to achieve forest renewal standards identified by the MB forestry Branch (Sec 9.9.6, 10-Year FMP)	Although the 1995 EIS does not specifically address residual effects of regeneration surveys, it does describe the likelihood that LP's harvest and post harvest management will achieve its forest profile goals. Effects of these regeneration goals are described below in 'Regeneration Practices'.	Regeneration surveys will document the existence of regeneration and provide a comprehensive assessment of seedling quantity, quality, health and spatial distribution. All persons performing regeneration surveys for LP will be trained, licensed or certified as is applicable. Survey data will provide reports on status of harvest areas in FML#3, matrices for strategic forest management models, and analysis of site-specific treatment responses, relationships and development trends. (Sec 7.6.4.11, 20-Year FMP).	LP's ongoing efforts to study recruitment dynamics of harvested and regenerated species will contribute to reducing uncertainties regarding insufficient information on the effects of surveys on regeneration of understory species and structure (Sec 2.3, 3.2.3.3, and Appendix 2.2, Sec 2.6.1, 20-Year FMP).	Although specific number of years between harvest and regeneration surveys varies in the 20-Year FMP depending on stand composition, no substantial change is made.	Neutral	Regeneration practices from the 10-Year FMP resulted in Certificates of Reforestation for all hardwood, softwood and mixedwood plots harvested during 1995-2005 (Sec. 2.1.16.4, 20-Year FMP). This provides some indication of LP's success at evaluating their regeneration practices and ability to comply with Provincial standards.
Stand Management Activities (mechanical/chemical treatments, commercial thinning activities)		See Stand Tending Activities above		See Stand Tending Activities above		NA	NA	
Access Requirements		To avoid disturbance, equipment will be kept clear of watercourses and away from banks and will cross streams only at approved crossings. Limitations of logging activities adjacent to water bodies will also apply to reforestation activities to minimize soil erosion and stream sedimentation (Sec 9.9.9, 10-Year FMP).	On the basis of the literature and consideration of LP's commitments to the wise use of stream buffers, effects of forestry operations, and forestry chemicals on riparian-zone wildlife, water quality, erosion control, stream morphology, water temperature, flow-rates, and barriers to fish movement, can be mitigated to acceptable low levels. (Sec 9.1.1.7.2-9.1.1.8, 1995 EIS).	In water source areas, floodplains or on unstable slopes, spot scarification, treatment or no treatment will be prescribed to minimize soil disturbance. Equipment will be kept clear of watercourses, away from banks and will cross streams only at approved crossings to avoid disturbance. Reforestation activities to minimize soil erosion and stream sedimentation (Sec. 7.6.2.8.3, 20-Year FMP).	Uncertainties remain regarding residual effects of the 20-Year FMP on soil quality and hydrology. These uncertainties may be resolved with activities to speed regeneration, conservative buffer implementation, and increase understanding of understory flora response to harvest activities.	Wording of 20 year FMP is changed slightly without significant change to commitment or intent.	Neutral	No substantive change in wording or intent has occurred between the 10- and 20-Year FMP.
Forest Health								

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Insects and Disease	Insect and disease management	Employees will be aware and trained to look for potential outbreaks. Through data collection in Pre-harvest Surveys, advance notice of insect or disease outbreaks can be determined and appropriate measures taken. LP will participate in establishing research and development priorities to monitor insect and disease populations (Sec.5.2.1, 10-Year FMP).	Residual effects of LP's Insect and Disease management activities are not discussed in the 1995 EIS.	LP staff will be trained to identify areas infected with disease or infested with epidemic levels of insects during pre-harvest surveys (PHS). When such stands are located, trees with health problems will be tallied at each plot, with a rating for each pest by tree species and severity if infestation. Data collected in PHS will be sent to MC Forest Health for a coarse filter screening. The infested cutblock will be scheduled for accelerated harvest procedures with the goal of eradication and promotion of regeneration of healthy forests freer of pests and disease (Sec. 7.1.1.7, 20-Year FMP).	Accelerated harvest procedures may reduce the potential for insect or disease epidemics to reduce the value of forest stands. However, residual impacts of these protective measures may or may not include harvest activities with adverse impacts on wildlife or waterways.	The 20-Year FMP includes addition of intent to implement accelerated harvest.	**Neutral - Positive**	Discussion of accelerated harvest procedures does not include descriptions of harvest methods or adherence to buffer zones or leave area guidelines.
Fire Protection	Fire Protection Plan	LP is required to prepare a Fire Protection Suppression Plan describing LP's equipment, manpower, and transportation facilities available to the province for the detection and suppression of fires. LP is committed to cooperation with the province to develop strategies for dealing with fires and to providing the province with workers and equipment for fire suppression (Sec. 8.3, 10-Year FMP)	Residual effects of LP's Insect and Disease management activities are not discussed in the 1995 EIS.	LP's Forest Management Licensing Act (1994) stipulates that the province is responsible for all forest protection services. LP cooperates fully with Manitoba Conservation in the prevention, detection, and suppression of forest fires within the Mountain Forest Section, including maintenance of equipment, provision of manpower, and transportation facilities Sec. 6.1, 20-Year FMP).	Fire protection activities described in the 20-Year FMP will likely provide provincial fire protection efforts with adequate support should such support be required.	None	**Neutral**	No substantive change in wording or intent has occurred between the 10- and 20-Year FMP.
Integration of Forest Management Activities With Other Land Uses								
Evaluation of Preferred Management Approach								
Operating Practices								
Harvesting Block Planning								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP								
Objective, Strategy, Activity, or Procedure	**Details**	**10-Year FMP**		**20-Year FMP**		**Change in FMP**	**Change in Effect Due to Change in FMP (colour coded)**	**Comments**
		Proposed Practices	**Residual or Uncertain Effects**	**Proposed Practices**	**Residual or Uncertain Effects**			
Pre-harvest Survey		The AOP will specify blocks to be harvested with specific details for management of individual blocks based on pre-harvest surveys. Pre-harvest surveys require field crews to collect a wide variety of site specific data. In order to accomplish this, crews will be provided with training specific to the type of data to be collected, including manual- and site-based training procedures. LP has contacted experts in various fields to assist in training (Sec. 9.2.4, 10-Year FMP)	The 1995 EIS acknowledges LP's commitment to monitoring programs incorporated in the FMP. These programs include pre- and post-harvest surveys and long-term ecological monitoring efforts. The EIS mentions that many of the FMP conservation strategies rely on detections made in the pre-harvest surveys (Sec. 9.1.1.6.1-5, 1995 EIS). The EIS recognizes LP's application of survey and monitoring findings to make changes to harvest activity and cutblock design. It also notes that these findings need to be described in AOPs to ensure their accessibility to SAC members monitoring forestry operations (Sec. 10.2.1-2, 1995 EIS).	A pre-harvest survey is a site-specific ecosystem assessment of a harvest area prior to logging that serves to gather data on most aspects of the ecosystem. LP conducts pre-harvest surveys on cutblocks one year prior to harvest. The data gathered during the surveys is incorporated into a harvest prescription that includes site-specific mitigation measures.	Pre-harvest surveys are not expected to result in environmental effects. Information gathered during pre-harvest surveys is used to implement appropriate mitigation measures to minimize environmental effects.	Although wording and location of this topic in the 20-Year FMP has changed, LP has continued to conduct Pre-harvest surveys in the same fashion.	**Neutral**	Pre-harvest surveys help to identify critical and unique areas as well as areas of cultural or recreational value. They serve as a tool for enabling better planning of the roads and cutblocks based on ground truthed information. Thus, they help to reduce or prevent adverse effects by ensuring appropriate mitigation measures are incorporated into cutblock harvesting.
Harvest Block Layout		Cutblock design to consider watershed, local sensitive features, silviculture, aesthetics, wildlife, fisheries, local climate, harvesting economics, site features, stand type, logging system, and the needs of other users (Sec. 9.3.5, 10-Year FMP).	The consideration of these features within the cutblock design was likely to minimize most environmental effects including those on aesthetics, and the aquatic and socio-economic environment. The existence of the cutblocks were expected to have effects on wildlife by returning mature and over-mature habitat to early successional stages and by increasing the amount of edge habitat. Generally, these effects were expected to be positive for those species that use early successional habitat but negative for species that use mature and over-mature habitat (Sec 9.1.1.6.1, 1995 EIS). For more detail see Fish and Wildlife Strategies, Escape Cover.	Cutblock design to consider access, alternate uses, stakeholder considerations, parks/closed areas, exceptional features, buffers, adjacent land use, heritage sites, natural boundaries, topography, wood volume, insects and disease, and maximum cutblock size (Sec. 7, 20-Year FMP). Pre-harvest surveys are used to ensure these considerations are incorporated into cutblock design.	Increased attention to factors such as access, topography etc., is expected to further reduce any remaining residual effects on the aquatic environment. Attention to the maximum cutblock size could potentially reduce effects on wildlife, if consideration of effects on local and regional wildlife is given during selection of maximum cutblock size.	The language of the 10-Year FMP has been generally re-worded in the 20-Year FMP to be more specific. Reference to access, insects and disease, topography and maximum cutblock size has been added to the 20-Year FMP.	**Positive**	The move toward more specific wording within the procedures is expected to be positive as it describes exactly what should be considered in cutblock design. The addition of a requirement to consider access, insects and disease, topography and maximum cutblock size in cutblock design is also expected to reduce environmental effects.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

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		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Designing Watercourse Considerations		Maintaining water-quality and aquatic environments by permitting passage of surface and stream flows, permitting fish passage, and preventing deposition of slash, debris and dirt into aquatic environments. Buffers will be maintained along creeks, lakes, and mineral licks. Building water crossings to withstand 1-in-50-year floods (Sec. 9.3.5, 10-Year FMP).	The practices specified for maintaining aquatic environments were expected to reduce effects associated with erosion, siltation, and fish passage.	Maintaining water-quality and aquatic environments by permitting passage of surface and stream flows, permitting fish passage, and preventing deposition of slash, debris and dirt into aquatic environments. Buffers will be maintained along creeks, lakes, and mineral licks. Building water crossings to withstand 1-in-100-year floods (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures). Stream crossing assessments are conducted, where required, prior to construction of stream crossings. Information is collected on stream hydrology, morphology, in-stream cover and habitat characteristics and fish and invertebrates. This information is then summarized and used to determine the most appropriate crossing type for that location.	The only change in residual environmental effects expected is that the construction of water crossings to 1-in-100-year floods is likely to reduce erosion during larger flood events and thus improve the quality of fish habitat in the event of flood events. The 20-Year FMP describes use of stream crossing assessments to identify appropriate crossing types, this mechanism is expected to reduce the likelihood and occurrence of potential environmental effects.	The only change in procedures between the two plans pertains to a requirement to build water crossings to withstand 1-in-100-year floods rather than 1-in-50-year floods. Stream crossing assessments began to be conducted during the implementation of the 10-Year FMP and so are described in the 20-Year FMP.	**Positive**	Constructing more robust water crossings to withstand 1-in-100-year flood events rather than 1-in-50-year will reduce erosion and thus improve quality of fish habitat in the event of flood events. There are also socio-economic effects of this as road crossings that can withstand more extreme weather will reduce loss of time due to road repairs. The use of stream crossing assessment has provided a means to ensure appropriate mitigation measures are implemented to prevent effects to the aquatic environment.
Determination of Stand Condition and Harvest Priority		Timber cruising and GIS analysis to verify predictions and prioritize harvest. Harvesting oldest, poorest condition timber first (Section 9.3.1).	Harvesting of mature and over-mature timber was expected to benefit species that use early successional stage habitat while resulting in adverse effects on species that use mature forest habitat.	The 20-Year FMP Objectives to maintain ecosystem health and function, and to provide goods and services for present and future generations is supported by plans to maintain the existing range of forest structure conditions over the long term. LP acknowledges that harvesting the oldest stands first may decrease the overall age of the forest and therefore plans to implement a scenario that will ensure some older forest structure is maintained (Sec 7.1.1.2, 20-Year FMP).	Concerns raised in the 1995 EIS related to a general reduction in age class within the FMLA may be alleviated through this move away from harvesting oldest aged trees first. In addition, LP's intent that harvest priorities incorporate maintenance of habitat types strongly associated with old growth stands is consistent with the Company's ecological priorities.	The intent to maintain forest structure including mature and overmature stands in the Plan area represents a change in harvest scenario from the 10- to the 20-Year FMP.	**Positive**	It is expected that the inclusion of this objective and related strategy in the plan will prevent or reduce a widespread reduction in age class throughout the plan area and will also conserve habitats that are strongly associated with old growth forest stands.

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		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Classification of Stand Merchantability	Classification of Stand Merchantability	Following merchantability standards wherein net merchantable timber includes all stands with a standard 15% reduction to account for natural losses. Net operable III includes 25 m^3/ha of conifers, or 40 m^3/ha of aspen, net operable II, with 55 m^3/ha of hardwood or softwood, and net operable I with 55 m^3/ha of softwood species.	The harvest of merchantable timber results in changes to habitat, which, in turn lead to effects on wildlife. The exact nature of the effects depends on the species and the cutblock design and harvest practices.	Inclusion of all merchantable stands within FML#3 indicated within the Annual Allowable Cut (AAC). Consideration of both present and future merchantability of the adjacent areas as well. The Annual Allowable Cut was updated for the 20-Year FMP.	LP will comply with the AAC defined by the province of MB in 1995 and updated as of 2006.	The 20-Year FMP procedures move from specified limits to a general statement of compliance with the AAC, as dictated by the provincial government in 2006.	**Neutral**	Classification of Stand Merchantability is defined by the Annual Allowable Cut set by the provincial government in 1995 and updated in 2006.
Selecting Harvest Methods: Clear-cut		Removing all of the merchantable trees from the cutblock. Identification and preservation of sensitive features etc. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Classification of watercourses, and careful planning of crossings. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Retaining buffers along roads and critical habitat. The clearcut method optimizes re-growth of trembling aspen by warming the soil and promoting suckering. Retaining buffers along roads. Clearcuts range from 3-103 ha (Section 9.3.6).	Removal of all merchantable trees from a cutblock was expected to result in visual impacts. The change in habitat associated with clearcut was also expected to have impacts on wildlife, although the nature and extent of the impact was species dependent. Changes in habitat could vary depending on the cutblock size. The attention to carefully planning and buffering water crossings was expected to mitigate potential effects on the aquatic environment.	Removing most of the merchantable trees from the cutblock. Identification and preservation of sensitive features etc. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Classification of watercourses, and careful planning of crossings. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Retaining buffers along roads and critical habitat. The clearcut method optimizes regrowth of trembling aspen by warming the soil and promoting suckering. Retaining buffers along roads (Section 7, 20-Year FMP, SOG – Planning).	The change in practice of removing all the merchantable trees to removing "most of the merchantable trees" ensures that leave areas remain. The leave areas are intended to reduce adverse effects of harvesting on wildlife. These areas may also reduce visual effects. The 20-Year FMP eliminates the reference to cutblock size so it is unclear if clearcut cutblock size will be similar. Changes in environmental effects due to change in cutblocks sizes could not be evaluated.	The only changes specified in the 20-Year FMP regarding Harvest Methods: Clearcuts are - the required removal of most of the merchantable trees rather than all merchantable trees and - the range in sizes of clearcuts is no longer specified in the 20-Year FMP.	**Positive** **Uncertain**	The practice of removing "most of the merchantable trees" rather than all merchantable trees is likely to reduce effects on wildlife, as presumably some trees will be left for wildlife habitat. The range in cutblock sizes is not described in the 20-Year FMP, therefore, changes in environmental effects associated with changes in cutblocks sizes cannot be identified or described.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Selecting Harvest Methods: Selection Cut		Removing selected or prescribed trees from a cutblock. Identification and preservation of sensitive features etc. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Classification of watercourses, and careful planning of crossings. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Retaining buffers along roads and critical habitat. Leave seed bearing white spruce to allow continuance of mixedwood. The selection cut method optimizes re-growth of trembling aspen by warming the soil and promoting suckering. Retaining buffers along roads (Section 9.3.6).	The specified practices are expected to mitigate effects on the aquatic environment. The change in habitat is likely to result in effects on wildlife species although the exact effect depends on the species.	Removing selected or prescribed trees from a cutblock. Identification and preservation of sensitive features etc. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Classification of watercourses, and careful planning of crossings. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Retaining buffers along roads and critical habitat. Leave seed bearing white spruce to allow continuance of mixedwood. The selection cut method optimizes re-growth of trembling aspen by warming the soil and promoting suckering. Retaining buffers along roads (Appendix 2.2, Section 3.1.11).	The practices stated are similar and thus, the environmental effects are expected to be similar to those found for the 10-Year plan.	The discussion of wildlife trees is incorporated into this section.	Neutral	Although wording and organization of topics has been changed in the 20-Year FMP, no substantive change in practice or intent has occurred regarding LP's intent to incorporate Wildlife Tee retention practices into their selection of harvest methodologies.

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Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
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Selecting Harvest Methods: Patch Cut		Removing all merchantable trees from a series of small areas (usually a few hectares). Identification and preservation of sensitive features etc. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Classification of watercourses, and careful planning of crossings. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Retaining buffers along roads and critical habitat. The clearcut method optimizes re-growth of trembling aspen by warming the soil and promoting suckering. Retaining buffers along roads (Section 9.3.6).	Harvesting small patches returns the path to early successional stages, which benefits ungulates.	The Standard Operating Guidelines included in the 20-Year FMP do not include a description of this harvesting practice, but see discussion of Cutblock Design in Fish and Wildlife Strategies above.	If this harvest method is no longer being used any positive effects associated with this practice will cease to occur.	Reference to Patch Cut harvesting methods have been eliminated from discussion of Harvest Methods in the 20-Year FMP. However, discussion of Variable Retention and leave areas (Sec 7.6.5.2.4) identify all harvest methods as deriving from the “Patch Cut” methodology.	**Neutral**	Harvesting small patches has a positive effect because it creates small openings, which are secure feeding areas for ungulates. Inclusion of this technique within all harvest methods practiced in the FMLA will continue to mitigation to harvest activities in the Plan area.
Selecting Harvest Methods: Careful Logging Around Advanced Growth	CLAAG	Identification and preservation of sensitive features and plan for selective and less invasive cutblock design. Retaining buffers along roads and critical habitat. This method of maintaining existing softwood understory is beneficial to the forest. Following natural boundaries and terrain and retaining buffers along watercourses in order to minimize erosion. Specific operating conditions and the type of harvest equipment to be used will be based on the nature of the soils and moisture conditions, slope, timber volumes, season, and potential for erosion. Classification of watercourses, and careful planning of crossings (Section 9.3.6).	The maintenance of existing understories is beneficial to wildlife by providing habitat and cover immediately following harvesting. This practice also protects soil from desiccation and erosion (sec 9.1.1.5.3, 1995 EIS).	Understory protection practices and retention of habitat equivalent to that conserved by CLAAG have been incorporated into 20-Year FMP SOGs (Sec 7.1.1.6, 20-Year FMP).Also see descriptions of Understory Protection in Forest Renewal/Silvicultural Practices below.	Understory protection practices are expected to provide the same mitigative potential as CLAAG practices did in the 10-Year FMP.	Reference to Careful Logging Around Advanced Growth harvesting methods have been eliminated in the 20-Year FMP but are included in the Provincial Guidelines and thereby incorporated in LP’s 20-Year FMP.	**Neutral**	Although wording and organization of topics has been changed in the 20-Year FMP, no substantive change in practice or intent has occurred regarding LP’s intent to conserve advanced growth of understory in harvest areas.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

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Selecting Harvest Methods: Wildlife Trees		Leave wildlife trees in clearcuts to mimic fire (Sec 9.3.6, 10-Year FMP).	Although harvesting is expected to have both adverse and positive effects, with the nature of the effect dependent on the specific species, the practice of leaving wildlife trees in clearcuts was expected to reduce adverse effects on some wildlife.	The SOGs for biodiversity state several guidelines for wildlife trees including; minimum retention of 8-12 wildlife trees per/ha on average in cutblocks larger than 10 hectares, minimum of 25 cm dbh, with smaller trees left when no larger diameter trees are present within the stand, retention of larger trees over 45 dbh is encouraged, Wildlife trees distributed throughout the block both in single trees and wildlife tree patches, and leave patches to be no more than 400m apart (Section 7, Standard Operating Guidelines – Biodiversity).	The practice of leaving wildlife trees was implemented to preserve biodiversity, such as by preserving suitable habitat for cavity-dependent birds and mammals, thus residual effects are likely to be related to reducing effects on wildlife associated with clearcutting.	The SOGs contained within the 20-Year FMP provide specific guidelines for retaining wildlife trees with the intent of satisfying an objective to preserve biodiversity.	**Positive**	The implementation of guidelines for retention of wildlife trees with the intent of maintaining biodiversity is likely to reduce negative effects on wildlife.
Cutblock Design Considerations								
Determination of Cutblock Shape/Size		Determine size, width and shape by considering silviculture requirements, watershed, terrain, stand condition, and wildlife habitat considerations. Maintaining an average cutblock size of 60 ha with a maximum of 100 ha (Section 9.3.6).	The size of the cutblock can influence effects on wildlife, as the cutblock size and shape can change the amount of edge habitat available. This effect can be adverse for some species but positive for others. Most of the other practices described helped to mitigate effects on the aquatic environment.	Determine size, width and shape by considering silviculture requirements, adjacent streams and buffers, natural boundaries, adjacent harvest areas, local recreation values, retention of structure for biodiversity or protection of understory, wildlife habitat considerations, and provincial cutblock guidelines as regulated by Manitoba Conservation (Section 7, SOGs – Planning)..	The commitment to consider effects on biodiversity and understory within cutblock planning is expected to have a positive effect on wildlife and the terrestrial environment. Attention to local recreation values is likely to have a positive socio-economic effect.	The 20-Year FMP refers to Manitoba Conservation guidelines, retention of biodiversity and understory, and local recreational values. It replaces "watershed" with the more specific streams and buffers, and replaces "terrain" with "natural boundaries"; however, it omits reference to cutblock size.	**Positive**	Many of the practices that have been added to these guidelines (i.e., retention of structure for biodiversity, considering local recreation) are expected to reduce potentially negative effects or have positive effects.
Determining Cutblock Location		Consider the cumulative effect of adjacent cutblocks. Determine whether adjacent blocks have sufficient regeneration. Consider and mitigate impacts to critical habitats and sensitive areas. Minimize the visual impact, and minimize the effects of vehicle access on wildlife populations (Sections 9.3.5 and 9.3.6).	These practices were expected to reduce or mitigate environmental effects.	The cutblock areas were determined using the Patchworks simulation model, which incorporates various constraints including harvest patches, watershed disturbance, etc. The locations of specific cutblocks are stated in the Annual Operating Plans and pre-harvest surveys are used to determine specific silvicultural prescriptions for each cutblock.	The use of the Patchworks model, which can incorporate and consider several different constraints, is now used for determining possible cutblock areas.	The use of the model can assist in reducing certain effects, for example those relating to road density, and the generation of a silvicultural prescription during the pre-harvest surveys will prevent or reduce avoidable environmental effects. The effects of returning the forest to an earlier age class and increasing edge density cannot be avoided and these effects are positive for species that prefer this type of habitat but adverse for species that prefer mature age classes and interior forest.	**Positive**	The ability to consider various constraints over both a broad time and geographic base through the use of the Patchworks model is a feature of the 20-Year FMP that is likely to reduce or prevent environmental effects. Change in forest age class and edge habitat is an inevitable result of forestry and occurs as a result of both plans.

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		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Wood Supply								
Contingency Areas		Specify contingency areas in AOP in the same detail required for harvest blocks. These areas to be harvested in case original choice not harvestable due to weather, operating conditions, or unforeseen circumstances (Section 9.2).	The EIS does not specify any effects related to contingency areas, however, if the contingency areas were harvested the effects would likely be expected to be the same as in regular cutblocks.	Specify contingency areas in AOP in the same detail required for harvest blocks. These areas to be harvested in case original choice not harvestable due to weather, operating conditions, or unforeseen circumstances. Contingency areas may be logged where there are unforeseen shortfalls due to early break-up, late-freeze-up, or wet summer soil conditions (Section 7, SOGs – Planning).		Contingency areas may be logged where there are unforeseen shortfalls due to early break-up, late-freeze-up, or wet summer soil conditions. (This basically just gives further detail to what was in the 10-Year plan.)	**Neutral**	No change in practice.
Stand Condition and Harvest Priority		The condition of the timber in a stand will determine harvest priority. Age, health, and vigour determine stand condition, and normally the oldest, poorest condition timber is removed first (sec 9.3.1, 10-Year FMP).	Analyses conducted in the EIS suggest that most of the commercially important softwood and hardwood species may experience a dramatic reduction in availability or a need to reduce the AACs in the future for areas within the FML. This reduction in timber supply will result from an imbalance in the age classes, which are dominated by mature and overmature aspen stands. Essentially these areas will need to be cut in an accelerated manner, which will lead to an abundance of newly harvested stands. This cycle of harvestable volumes will need to be broken to ensure consistent levels of harvest volumes throughout an entire rotation period (Sec 8.3.2.4, 1995 EIS).	Strategies include "maintain the range of representation of the current range of ecosystem groups and associated forest species composition" (Section 7.1.1.1, 20-Year FMP), and "Maintain the existing range of forest structure conditions over the long term" (Section 7.1.1.2, 20-Year FMP). The 20-Year FMP also notes that the priority of harvesting oldest aged trees first may be changed. According to research conducted in Permanent Sample Plots there is evidence that some forest types can increase hardwood volume and conifer volume as the stand ages through gap phase dynamics (Sec 7.1.1.2, 20-Year FMP)	Emphasis on maintenance of forest ecosystem groups (ecosites) and forest structure over time may result in increased conservation of vegetation and wildlife species associated with more diverse forest ecosites LP's interest in alternate harvest priorities that focus less on 'oldest first' techniques may allow the Company to conserve critical elements of the landscape and habitat types strongly associated with old forests.	An emphasis on harvest of old aged trees in the 10-Year Plan has shifted in the 20-Year FMP to an acknowledgment that old forests may be associated with habitats and a role in landscape design. The 20-Year FMP notes that LP is considering changes to the harvest schedule profile for FMU13.	**Positive**	Although LP recognizes that provincial AAC will impact harvest planning, consideration is being given to maintenance of mature stands present within the forest structure in FMU13. In light of the EIS conclusion that some change needed to be made to avoid foreseeable reductions in timber availability (related to accelerated harvest of mature trees), re-evaluation of condition and priority of timber in the 20-Year FMP seems appropriate.
Wildlife Habitat Management								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP								
Objective, Strategy, Activity, or Procedure	**Details**	**10-Year FMP**		**20-Year FMP**		**Change in FMP**	**Change in Effect Due to Change in FMP (colour coded)**	**Comments**
		Proposed Practices	**Residual or Uncertain Effects**	**Proposed Practices**	**Residual or Uncertain Effects**			
Heritage Resources		Conducting of pre-harvest surveys to identify heritage resources sites and required mitigation measures as determined by the Heritage Resources Branch in consultation with LP for significant sites (Sec. 9.5.2, 10-Year FMP).	The EIS concluded any adverse effects pertaining to heritage resources were likely to be mitigated, minimizing potential negative effects.	Conducting of pre-harvest surveys will identify potential heritage resources sites and required mitigation measures. Required mitigation measures for significant sites will be determined by Heritage Resources Branch in consultation with LP. Operational guidelines for providing a 150-m buffer zone around hiking trails and backcountry campsites, and excluding logging operations from cultural or heritage sites.	Effects are likely to be mitigated.	The practices stated in both plans are essentially the same, although the SOG in the 20-Year FMP does include additional guidelines.	**Positive**	The inclusion of additional guidance for protecting heritage resources is a further mitigation measure that is likely to reduce effects on heritage resources.
Access Management								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Construction of All-Weather Road (Class I and II)		Minimize disturbance of soil, water, adjacent tree roots, and reduce required reclamation. Retain vegetation on RoW where possible. Do not strip soil or vegetation in adjacent stands, or along watercourse. Use minimum number of borrow pits, or use extant ones, and construct by permit from Manitoba Natural Resources. Maximize habitat potential during rehabilitation of pits, do not locate near groundwater sources. Avoid chemical spills. Construct backslope with regular profile, no hanging banks or sharp ditches. Use mineral soil only for backfill. Employ erosion control measures including: bank restoration, revegetation, reseeding, and removal of unstable fill materials Culverts designed for 1:50 year floods (Section 9.6 and 9.7).	The specified practices were expected to mitigate effects on erosion, change to runoff and infiltration and other effects on the aquatic environment.	General practices for road clearing for all types of roads include minimizing disturbance to duff and organic soil layers, keeping stripped topsoil and debris out of neighbouring stands, not stripping the organic horizon and herbaceous vegetation on the approach to the watercourse crossings, storing topsoil apart from logging debris and using for land and road reclamation, not constructing roads and trail within 100 m of the high water mark of any permanent stream and within 30 m of the high water mark of an intermittent stream, unless there is no other location, avoiding conducting associated road construction activities such as borrow pits, landings, camp and storage sites in buffer zones (Sec. 7, 20-Year FMP, SOG – Forest Roads and Major Structures). Plan preparation for these types of roads involves detailed design plans on air photo mosaics and cross-sectional profiles for water crossings. The types of structures for water crossings, erosion control measures, hydrological information, revegetation and reclamation plans, and right-of-way requirements must all be specified. Borrow pit locations must be specified prior to construction (Sec. 7, 20-Year FMP, SOG – Forest Roads and Major Structures).	The addition of a requirement to use topsoil for reclamation where feasible is expected to have a positive effect on soil fertility. Avoidance of road construction within 100 m of the high water mark and within 30 of intermittent streams is expected to further mitigate potential effects on the aquatic environment.	Store topsoil away from debris and use for land reclamation where feasible. Avoid road and trail construction within 100m of high-water mark of permanents streams, 30m from intermittent streams and springs. Avoid conducting road construction activities within buffer zones.	**Positive**	Keeping topsoil aside for reuse in reclamation reduces the need to purchase and bring in clean fill, while keeping that topsoil clean and debris free improves the quality of foundation for revegetation efforts (AWP1). Avoiding road/trail construction and construction activities within and along watercourses is mentioned in the "standards and guidelines for operating along watercourses table" (Section 7, 20-Year FMP, SOG – Planning). However, the 100-m value exceeds the minimum guidelines, which would have a positive change in effect over existing guidelines. Avoiding construction activity in buffer zones preserves/maintains the quality of the buffers provided for by buffering practices.
Operation/Use of All-Weather Road (Class I and II)		Requires annual maintenance, observe maximum speed of 90 kph for Class I, 80 kph for Class II (Section 9.6 and 9.7).	Potential effect of increase in vehicle-ungulate collisions as a result of road use.	Requires annual maintenance, observe maximum speed of 90 kph for Class I, 80 kph for Class II (Section 9.6 and 9.7).	Potential effect of increase in vehicle-ungulate collisions as a result of road use.	No change.	**Neutral**	No change from 10-Year to 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Construction of Dry-Weather Road (Class III and IV)		Minimize disturbance of soil, water, adjacent tree roots, and reduce required reclamation. Retain vegetation on RoW where possible. Do not strip soil or vegetation in adjacent stands, or along watercourse. Use minimum number of borrow pits, or use extant ones, and construct by permit from Manitoba Natural Resources. Maximize habitat potential during rehabilitation of pits, do not locate near groundwater sources. Avoid chemical spills. Construct backslope with regular profile, no hanging banks or sharp ditches. Use mineral soil only for backfill. Employ erosion control measures including: bank restoration, revegetation, reseeding, and removal of unstable fill materials Culverts designed for 1:50-year floods (Section 9.6 and 9.7).	The specified practices were expected to mitigate effects on erosion, change to runoff and infiltration and other effects on the aquatic environment.	General practices for road clearing for all types of roads include minimizing disturbance to duff and organic soil layers, keeping stripped topsoil and debris out of neighbouring stands, not stripping the organic horizon and herbaceous vegetation on the approach to the watercourse crossings, storing topsoil apart from logging debris and using for land and road reclamation, not constructing roads and trail within 100 m of the high water mark of any permanent stream and within 30 m of the high water mark of an intermittent stream, unless there is no other location, avoiding conducting associated road construction activities such as borrow pits, landings, camp and storage sites in buffer zones (Sec. 7, 20-Year FMP, SOG – Forest Roads and Major Structures). Effects are likely to be mitigated.	The addition of a requirement to use topsoil for reclamation where feasible is expected to have a positive effect on soil fertility. Avoidance of road construction within 100 m of the high water mark and within 30 of intermittent streams is expected to further mitigate potential effects on the aquatic environment.	Store topsoil away from debris and use for land reclamation where feasible. Avoid road and trail construction within 100 m of high-water mark of permanent streams, 30 m from intermittent streams and springs. Avoid conducting road construction activities within buffer zones.	**Positive**	Keeping topsoil aside for reuse in reclamation reduces the need to purchase and bring in clean fill, while keeping that topsoil clean and debris free improves the quality of foundation for revegetation efforts (AWP1). Avoiding road/trail construction and construction activities within along watercourses is mentioned in the "standards and guidelines for operating along watercourses table" (Section 7, 20-Year FMP, SOG – Planning). However, the 100-m value exceeds the minimum guidelines, which would have a positive change in effect over existing guidelines. Avoiding construction activity in buffer zones preserves/maintains the quality of the buffers provided for by buffering practices.
Operation/Use of Dry-Weather Road (Class III and IV)		Class III requires annual maintenance, maintain as required for Class IV. observe maximum speed of 60 kph for Class III, 40 kph for Class IV (Section 9.6 and 9.7).	Potential effect of increase in vehicle-ungulate collisions as a result of road use.	Class III requires annual maintenance, maintain as required for Class IV. observe maximum speed of 60 kph for Class III, 40 kph for Class IV (Section 9.6 and 9.7).	Potential effect of increase in vehicle-ungulate collisions as a result of road use.	No change.	**Neutral**	No change from 10-Year to 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Construction of Seasonal Road (Class V and VI)		Minimize disturbance of soil, water, adjacent tree roots, and reduce required reclamation. Retain vegetation on RoW where possible. Do not strip soil or vegetation in adjacent stands, or along watercourse. Use minimum number of borrow pits, or use extant ones, and construct by permit from Manitoba Natural Resources. Maximize habitat potential during rehabilitation of pits, do not locate near groundwater sources. Avoid chemical spills. Construct backslope with regular profile, no hanging banks or sharp ditches. Use mineral soil only for backfill. Employ erosion control measures including: bank restoration, revegetation, reseeding, and removal of unstable fill materials Design culverts for 1:25 year floods, and use portable bridges where possible (Section 9.6 and 9.7).	The specified practices were expected to mitigate effects on erosion, change to runoff and infiltration and other effects on the aquatic environment.	General practices for road clearing for all types of roads include minimizing disturbance to duff and organic soil layers, keeping stripped topsoil and debris out of neighbouring stands, not stripping the organic horizon and herbaceous vegetation on the approach to the watercourse crossings, storing topsoil apart from logging debris and using for land and road reclamation, not constructing roads and trail within 100 m of the high water mark of any permanent stream and within 30 m of the high water mark of an intermittent stream, unless there is no other location, avoiding conducting associated road construction activities such as borrow pits, landings, camp and storage sites in buffer zones (Sec. 7, 20-Year FMP, SOG – Forest Roads and Major Structures). Class V and VI road preparation involves preparing a road alignment plan on aerial photographs and forest cover maps and preparing profiles of critical areas. For this road class, the use of small borrow pits were to be incorporated into the right-of-way (Sec. 7, 20-Year FMP, SOG – Forest Roads and Major Structures).	The addition of a requirement to use topsoil for reclamation where feasible is expected to have a positive effect on soil fertility. Avoidance of road construction within 100 m of the high water mark and within 30 of intermittent streams is expected to further mitigate potential effects on the aquatic environment.	Store topsoil away from debris and use for land reclamation where feasible. Avoid road and trail construction within 100m of high water mark of permanents streams, 30 m from intermittent streams and springs. Avoid conducting road construction activities within buffer zones.	**Positive**	Keeping topsoil aside for reuse in reclamation reduces the need to purchase and bring in clean fill, while keeping that topsoil clean and debris free improves the quality of foundation for revegetation efforts (AWP1). Avoiding road/trail construction and construction activities within along watercourses is mentioned in the "standards and guidelines for operating along watercourses table (Appendix 2.2, Section 2.1.2)" However, the 100-m value exceeds the minimum guidelines, which would have a positive change in effect over existing guidelines. Avoiding construction activity in buffer zones preserves/maintains the quality of the buffers provided for by buffering practices.
Operation/Use of Seasonal Road (Class V and VI)		Maintain as required for Class V and VI. Road design speed dependant on road condition (Section 9.6 and 9.7).	Potential effect of increase in vehicle-ungulate collisions as a result of road use.	Maintain as required for Class V and VI. Road design speed dependant on road condition (Section 9.6 and 9.7).	Potential effect of increase in vehicle-ungulate collisions as a result of road use.	No change.	**Neutral**	No change from 10-Year to 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Road Planning		Select ROW location based on wildlife, and aesthetics screening, need for road grade drying, terrain type and safety concerns. Mark centerlines for Manitoba Natural Resources inspection before construction (Section 9.6 and 9.7).	These practices were expected to reduce adverse environmental effects of roads related to erosion, runoff and infiltration. However, certain effects of roads, such as increase wildlife mortalities due to increased hunting pressures and vehicle collisions, were expected to occur.	Considering topography, location and types of watercourses and wetlands, proximity to lakes and unique features, critical wildlife habitat, existing roads and trails, cultural features, protected area, number of cutblocks to be accessed, season of use and other users. After a road system has been designed, LP staff ground truth the area to ensure the road system will not conflict with any of these. Roads must meet standards for intended use, based on road classification. The access management prescription will be pre-mitigated by DFO, MC and the SAC, and submitted to federal and provincial governments for final review.(Section 7, 20-Year FMP – Forest and Roads and Major Structures). . Road densities for each operating area were used as an indictor during the planning process. Road densities in the model could be managed by controlling disturbance patch size distributions and constraining road building, the long-term effect of aggregating harvest blocks and allowing for large term disturbance patches is to lessen the impact of road densities across the forest over time (Section 5.5.1, 20-Year FMP).	The addition of a pre-mitigation procedure with review by several interest is likely to result in further prevention and mitigation of environmental effects of roads. The use of road density as an indicator and the effort to reduce road density, is likely to decrease potential effects of roads on wildlife.	No mention in 10-Year plan of considerations of existing conditions or features.: Seeking approvals from IRMT, but replaced by comprehensive review by numerous agencies. The use of road density as an indicator has also been added to the 20-Year FMP.	**Positive**	The change in wording suggests that effort will be made to alter road locations based on pre-existing conditions rather than simply siting roads wherever desired as is suggested by the wording of the 10-Year FMP. The effort to reduce road density is likely to reduce negative effects on wildlife. Incorporating existing conditions into road planning will likely have a positive effect. The approvals and "pre-mitigation" phase is carried out by a variety of agencies with different interests and should satisfy a broader range of environmental concerns.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Road Management		Return ROW to original state by removing watercourse and drainage structures, recontouring land, cross-ditching to disperse run-off, decompacting roads, and revegetating and reforesting through mulching and fertilization. For temporary road closures, consider whether ATV access in area should remain, and to what degree. Monitor and retain structural or erosion control where watercourse crossings are retained. Restrict access with barricades and impediments. Remove watercourse and drainage structures where possible. Backslope approaches. Stabilize erodable slopes with rollback. Reseed RoWs with approved reclamation species. Create cross-ditching to disperse run-off (Section 9.6.2).	These practices are expected to reduce effects of roads on erosion, runoff and infiltration.	Return ROW to original state by removing watercourse and drainage structures, recontouring land, cross-ditching to disperse run-off, decompacting roads, and revegetating and reforesting. For temporary road closures, consider whether ATV access in area should remain, and to what degree. Monitor and retain structural or erosion control where watercourse crossings are retained. Restrict access with barricades and impediments. Remove watercourse and drainage structures where possible. Backslope approaches. Stabilize erodable slopes with rollback. Reseed RoWs with approved reclamation species. Create cross-ditching to disperse run-off (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures).	If fertilization will no longer be used in reforesting this will be an additional positive effect as fertilizers have the potential to adversely effect water quality, especially if used near watercourses.	Removes mention of mulching and fertilization in discussion of revegetation.	**Positive**	Fertilizing and mulching have been known to cause detrimental effects. Fertilization in particular can affect soil microorganisms and insects, and may encourage growth of weeds, which may out compete regrowth of natural vegetation (AWP3). Fertilizers may also adversely affect water quality, especially if utilized near watercourses (AWP3).
Water Crossing Planning		Performed in accordance with approved work permit. Vehicles will cross at one location only during installation. Control erosion using hay, geotextile, etc . Timed so as to not interfere with fish migration, spawning and incubations periods. Rip-rapped culverts at inflow and outflow ends. Construct crossing in accordance with "Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat and Recommended Procedures for Protecting Fish Habitat in Lakes and Streams in Forest Cutting Areas" (Section 9.7).	The stated practices were likely to mitigate the potential effects of water crossings on the aquatic environment.	Performed in accordance with approved work permit. Vehicles will cross at one location only during installation. Control erosion using hay, geotextile, pipe bundles, etc . Time so as to not interfere with fish migration, spawning and incubations periods. Rip-rapped culverts at inflow and outflow ends. Construct crossing in accordance with "Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat and Recommended Procedures for Protecting Fish Habitat in Lakes and Streams in Forest Cutting Areas" (Section 7, 20-Year FMP, SOG – Forest Roads and Major Structures).	The practices remain the same, with the exception of including other options for erosion control measures.	Mentions possibility of using pipe bundles to allow for equipment passage over watercourses.	**Neutral**	Use of pipe bundles to cross watercourses may act as temporary "bridges" while allowing unimpeded water flow along watercourses. However, the size of the pipe bundles is an important factor, as is the orientation and method of "installation." A clearer description might clear up the uncertainty.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Road Classification		Road Classes I and II have 45 m and 30 m RoWs, and speeds of 90 kph and 80 kph respectively. Designed for 20-Year usage. Class III and Class IV have 20 m and 10-20 m RoW, and speeds of 60 and 40 kph respectively. Designed for 2-7 year usage. Class V and VI roads are designed for use <40 kph, have RoWs <20 m, and are designed for use for one to several seasons for crossing swamps, meadows, etc. (Section 9.6.2).	Regardless of road type, residual environmental effects of roads include effects on wildlife such as ungulates due to increased hunting pressures and wildlife collisions with vehicles.	Road Classes I and II have 45 m and 30 m RoWs, and speeds of 90 kph and 80 kph respectively. Designed for 20-Year usage. Class III and Class IV have 20 m and 10-20 m RoW, and speeds of 60 and 40 kph respectively. Designed for 2-7 year usage. Class V and VI roads are designed for use <40 kph, have RoWs <20 m, and are designed for use in winter (Appendix 2.2 Section 5.0).	Regardless of road type, residual environmental effects of roads include effects on wildlife such as ungulates due to increased hunting pressures and wildlife collisions with vehicles.	Replaced "Seasonal use" with "Winter Use."	Neutral	The change appears to be in the wording, not in the practice, therefore no changes in environmental effects are expected.
Harvest Operations								
Utilization Standards	Utilization Standards	LP utilizes timber that meets the conditions of the Manitoba Scaling Manual and the following utilization and quality standards: - dead, downed or broken trees whose merchantability content makes up 50% or more of the tree - LP will harvest and remove both deciduous and incidental coniferous timber from its cutblocks during the same harvesting operations according to requirements of the FML agreement, unless required for wildlife habitat - in cooperation with coniferous operators, LP will utilize deciduous timber harvested during coniferous operations in FML#3 (Sec. 9.7.2, 10-Year FMP)	LP compliance with provincial Utilization Standards is not evaluated in the 1995 EIS.	LP utilizes timber that meets the specifications identified in Timber Harvesting Practices for Forestry Operations in Manitoba, developed by MC, Forestry Branch, and the following utilization and quality standards: - all live, dead, downed or broken and defective trees whose merchantable content makes up 50% or more of the tree and meet the utilization and wood quality standards of LP will be utilized - - LP will harvest and remove both deciduous and incidental coniferous timber from its cutblocks during the same harvesting operations according to requirements of the FML agreement, unless required for wildlife habitat or seed trees as prescribed in the AOP. In cooperation with coniferous operators, LP utilizes merchantable deciduous timber harvest during coniferous operations in FML#3 (Sec 7.6.1.3.1, 20-Year FMP)	LP continues to comply with provincial Utilization Standards.	None	Neutral	Language and intent is consistent between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Hardwood	Utilization of Hardwoods	The OSB mill requires freshcut roundwood logs for optimum performance. To encourage contractors to deliver timber ASAP and ensure all roundwood delivered are fresh cut, LP will pay harvesting contractors for timber on delivery to the mill log yard. This practice will virtually eliminate the need for log storage in the field. On occasion, interim roundwood areas may be required when wood has to be forwarded to high ground immediately prior to spring breakup. Such storage areas will be short-term as timber will be moved as soon as road conditions allow. If and when roundwood log storage is required in the field, LP will make formal permit applications to MNR providing site-specific information. (Sec 9.7.2, 10-Year FMP)	The 1995 EIS only addressed utilization of hardwoods in terms of log storage leachate potential. The EIS states that because LP intends that aspen log storage be minimized and throughput to markets maximized, the potential for adverse to be minimized. However, the EIS also notes that, because LP acknowledges some hardwood log storage may occur, the potential for leachate is uncertain and requires site-specific attention during implementation of the AOP (Sec 9.1.1.7.8, 1995 EIS).	The OSB mill requires freshcut roundwood logs for optimum performance. To encourage contractors to deliver timber ASAP and ensure all roundwood delivered are fresh cut, LP will pay harvesting contractors for timber on delivery to the mill log yard. This practice will virtually eliminate the need for log storage in the field. On occasion, interim roundwood areas may be required when wood has to be forwarded to high ground immediately prior to spring breakup. Such storage areas will be short-term as timber will be moved as soon as road conditions allow. If and when roundwood log storage is required on Crown land, LP will make formal permit applications to MC providing site-specific information(Sec 7.6.1.3.1.1, 20-Year FMP). Residual non-merchantable trees will be left standing where possible. Felling of no-merchantable trees will be occur in pre-determined sites where probability of utilization by fuelwood users is high. At these sites, timber will be skidded to the roadside. In areas where non-merchantable wood much be felled and is not likely to be used for fuelwood, trees will be left at the stump as is more ecologically and aesthetically pleasing (Sec 7.6.1.3.1.2, 20-Year FMP).	Because LP intends that aspen log storage be minimized and throughput to markets maximized, the potential for adverse to be minimized. However, because LP acknowledges some hardwood log storage may occur, the potential for leachate is uncertain and requires site-specific attention during implementation of the AOP.	Text has been added to describe utilization of non-merchantable trees. Otherwise information provided is the same.	Neutral - Positive	The 20-Year FMP adds more detailed description on the utilization of non-merchantable trees. Otherwise language and intent remain the same between the 10- and 20-Year Plans.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Softwood	Harvest of Conifers	Softwood logs may be stored at various sites throughout the FML#3. Incidental softwoods will be cut along with hardwoods in LP's operations. Intermediate softwood log storage sites may be required from time to time before delivery of softwoods is made. Recent past practices have made use of log storage sites, which often serve as processing sites for chipping timber. Chips produced at these sites are hauled directly to the pulp mill, while remaining debris are burnt during winter months (Sec 9.7.2, 10-Year FMP).	No mention is made of this practice in the 1995 EIS.	Softwood logs may be stored at various sites throughout the FML#3. Incidental softwoods are harvested along with hardwoods in LP's operations. Intermediate log storage sites may be required from time to time before delivery of softwoods is made. Use of these sites for log storage is subject to MC approval following formal site-specific application (Sec 7.6.1.3.1.3, 20-Year FMP). Chipping sites serve as holding areas for timber as well as processing sites for chipping timber. Chipper debris will either be piled and burned at the roadside or spread onto the road network at a mean depth of 10cm. Spreading of debris onto specific roads may be denied if access is required for forest renewal activities, if the road existed before harvesting activities, or if the road may be used for future forestry activities in the area. . Use of these sites for chipper processing is subject to MC approval following formal site-specific application (Sec 7.6.1.3.1.4, 20-Year FMP).	Given that impacts of softwood log storage were too negligible to mention in the 1995 EIS, and that practices have essentially remained unchanged residual effects of soft utilization as it is described in the 20-Year FMP is expected to remain minimal. This also assumes that approval of log storage, chipping sites, and spreading of debris on roads is appropriate in proposed areas of the FML#3,	The 20-Year FMP adds information describing the utilization of chip processing sites. This section also acknowledges that use of softwood log storage and chip-processing sites is subject to provincial approval.	**Neutral - Positive**	The 20-Year FMP adds more detailed description on the utilization of chip processing sites and refers to request for provincial approval in the use of these sites. Otherwise language and intent remain the same between the 10- and 20-Year Plans.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Understory Protection	Understory Protection	Where coniferous understories have been identified for protection, either through advanced knowledge or through Pre-harvest surveys, LP will conduct operations consistent with the provisions of the AOP, Damage to concentrations of young coniferous growth in the understory will be minimized by proper placement of roads, skid trails, and landings. When large concentrations exist, the area will be marked by flagging ribbon and appropriate harvesting practices will be employed to protect and maximize growth potential of the conifer understory, and encourage regeneration (Sec 9.7.2, 10-Year FMP).	Effects of harvest practices on understory vegetation are variable. On softwood blocks, surface disruption, like scarification, would result in the substantial replacement of understory vegetation with an early successional community. On hardwood blocks, understory vegetation composition is highly variable and no long-term trends in understory communities can be made (Sec 9.1.1.5.3, 1995 EIS).	See description of Forest Renewal/Silviculture Practices, Understory Protection below.	A lack of information noted in the 1995 EIS regarding knowledge of harvest impacts on understory protection and regeneration has been addressed in part by LP's ongoing Permanent Sample Plots (PSP) monitoring efforts (Appendix 2.1.7.6, 20-Year FMP). LP's commitment to incorporation of information produced by this monitoring effort and other ongoing research will likely reduce residual impacts of harvest activities in the forest management area.	Although Understory Protection is not described in this section of the 20-Year FMP, considerable discussion of overarching objectives, strategies, and specific practices related to Understory Protection are incorporated through the Plan document.	**Positive**	LP's intent and focus on conservation of understory for regenerative purposes and to maintain local genetic diversity (see discussion of Biodiversity Objectives above) has been increasingly developed in the 20-Year FMP.
Forest Renewal/Silviculture Practices								

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Understory Protection	Understory Protection	Damage to concentration of young coniferous growth in the understory will be minimized by proper placement of roads, skid trails and landings. Where large concentrations exist, the area will be marked by flagging and appropriate harvest practices will be employed to protect the understory, maximize growth potential and encourage regeneration (Sec 9.7.2, 10-Year FMP).	Effects of harvest practices on understory vegetation are variable. On softwood blocks, surface disruption, like scarification, would result in the substantial replacement of understory vegetation with an early successional community. On hardwood blocks, understory vegetation composition is highly variable and no long-term trends in understory communities can be made (Sec 9.1.1.5.3, 1995 EIS).	LP implements understory protection practices to retain genetic stock of softwood trees present in the forest, thereby maintaining trees with better growth habits and greater resistance to disease (Sec. 7.2.3, 20-Year FMP). In aspen, white and black spruce, jack pine, and mixedwood cover types, softwood understory will be protected through the application of modified clearcut harvesting techniques (Sec. 7.6.3.1-5, 20-Year FMP). In particular, white spruce understory will be protected in any cutblock, regardless of veg-type (Sec. 7.6.4, 20-Year FMP). LP has assisted the Province of Manitoba in the development of provincial understory protection guidelines and standards (Sec. 7.6.4, 20-Year FMP).	A lack of information noted in the 1995 EIS regarding knowledge of harvest impacts on understory protection and regeneration has been addressed in part by LP's ongoing Permanent Sample Plots (PSP) monitoring efforts (Appendix 2.1.7.6, 20-Year FMP). LP's commitment to incorporation of information produced by this monitoring effort will likely reduce residual impacts of harvest activities in the forest management area. In recognition of the importance of prompt forest renewal, LP has incorporated this practice into the FMP. Pre- and post-harvest surveys create a system of harvest prescription and effects monitoring that allow timely recognition and application of understory protection and regeneration practices on stand level (Sec. 7.1.1.6, 20-Year FMP).	Additional text in the 20-Year FMP refers to protection practice standards, developed in cooperation with the Province of Manitoba, which provides greater detail on understory protection applicable at the stand level by vegetation type. .	**Positive**	Results of understory monitoring efforts contribute to additional detail in descriptions of understory protection practices. Overall, LP's intent and focus on conservation of understory for regenerative purposes and to maintain local genetic diversity (see discussion of Biodiversity Objectives above) has been increasingly developed in the 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Scarification	Scarification	Heavy anchor chains are used on jack pine – dominant and shallow soil sites to break up remaining logging slash, distribute seed bearing cones, and expose mineral soil to create favourable sites for seed germination (Sec. 5.2.4, 10-Year FMP).	Effects of harvest practices on understory vegetation are variable. On softwood blocks, surface disruption, like scarification, could result in the substantial replacement of understory vegetation with an early successional community. On hardwood blocks, understory vegetation composition is highly variable and no long-term trends in understory communities can be made (Sec 9.1.1.5.3, 1995 EIS).	In general, scarification is the preferred treatment for pure and mixedwood jack pine-dominant vegetation types. Harvest areas only accessible in winter or those present in drier upland sites are scarified break through slash and/or to expose mineral soil. Scarification will not be applied to sites where alternative silvicultural treatments are in practice (understory protection, shelterwood, etc), sites that might respond with excessive hardwood suckering, where the treatment might cause degradation or a reduction in productivity, and sites that are too small or too costly to apply scarification practices (Sec. 7.6.4.7, 20-Year FMP).	LP's commitment to careful application of this silvicultural practice will likely mitigate potential residual impacts associated with harvest practices.	The 20-Year FMP has added text describing in more detail circumstances under which scarification may be implemented. However, no change in practice or intent has been made.	**Neutral - Positive**	Results of understory monitoring efforts may contribute to LP's understanding of potential impacts of scarification on understory protection and general regeneration success.
Seed Inventory	Seed Inventory	To facilitate the supply of softwood seed and seedlings, LP will provide seed-bearing cones to the Province in sufficient quantity to meet the softwood forest renewal requirements of FML#3. Cones will be collected from merchantable, high-quality forest stands and local seed zones (Sec 9.9.3, 10-Year FMP).	LP plans to assist with collection of seed from the local area and plant healthy coniferous stock produced from this seed. While these actions will minimize impacts on the regions softwood genetic pool, a minor long-term impact to genetic diversity has potential to occur (Sec 9.1.1.5.4, 1995 EIS).	LP will: - Collect cones locally during high-yield years. - Monitor seed/cone crops. - Maintain seed inventory. - Make future collections of jack pine, white and black spruce seed within the FML#3 (Sec. 7.6.4.5-6 , 20-Year FMP).	Reseeding cutblocks with seeds collected during high-yield years may produce forest stands that reflect only a portion of the genetic pool within the local forest communities. Until stock produced by the Tree Improvement Program is integrated into regeneration practices, seed collection efforts may have residual effects on genetic diversity of reforested stands.	Wording in text has been changed without significant effect.	**Neutral**	Reseeding cutblocks with seeds collected during high-yield years may produce forest stands that reflect a subset of the genetic pool of local forest communities. More detail on Tree Improvement Program goals for seed collection aimed at maintaining local genetic diversity could be included in descriptions of Seed Inventory Practices.
Snow Caching	Snow Caching	Snow Caching is not discussed as a Forest Renewal or Silviculture Practice in the 10-Year FMP. Instead see Silviculture, Growing Stock Strategies snow Caching Strategies above.	NA	Snow caching of seedlings will reduce excessive handling stress on seedlings, thereby improving survival and growth, reduce transport and tree plant unit costs, minimize damage and disturbance to access roads (Sec. 7.6.4.8, 20-Year FMP).	Reduction of handling stress on seedlings may reduce chances of low regeneration yields and decrease residual effects due to damage or disturbance along access roads.	Addition of seedling caching practice to 20-Year FMP.	**Positive**	Evidence of seedling caching practices in the 10-Year FMP seems to be absent.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Tree Planting	Tree Planting	Tree Planting is not discussed as a Forest Renewal or Silviculture Practice in the 10-Year FMP. Instead see Tree Planting in Reforestation Potential Strategies under Silviculture, and in Forest Renewal Activities above.	NA	Spring tree planting activities will be conducted from mid-May – mid-June of each year. When temperatures rise and risk of frost damage to seedlings is low, planting of snow cached stock will commence. Summer tree planting activities will be conducted from mid-July until early August each year. To avoid potential seedling loss due to early frost and to ensure viable root-to-shoot ratios, summer stock is 'blacked out' at the nursery so that root growth can take place through fall, but bud elongation is postponed until the following spring (Sec. 7.6.4.9, 20-Year FMP).	As a result of LP's ongoing Permanent Sample Plots (PSP) monitoring efforts (Appendix 2.1.7.6, 20-Year FMP), information gained through this research will likely increase seedling survival throughout the FMA. In recognition of the importance of timely regeneration, LP has incorporated prompt forest renewal practice into the FMP (Sec. 7.1.1.6, 20-Year FMP). .	Regeneration standards reported in 20-Year FMP use the same stocking requirements described in the 10-Year FMP. The 20-Year FMP describes a new practice of summer planting and explains timing details related to seasonal planting.	**Positive**	New planting practice involving summer planting mat increase chances of successful reforestation and 'free to grow 'status.
Regeneration Surveys		LP will implement a growth and yield research program for major forest types on the FML. The major objectives of this program are to establish:- A base set of plots that will enable reliable estimations of second-growth and natural-stand yields. - A set of plots to test dynamics of mixedwood stands. - A set of plots, which will provide information on interactions between, stand stocking levels and silvicultural treatments. - From the data obtained from the previous thee objectives, calibrate a suitable growth model used to develop yield tables for the major species and stand mixtures present and to develop harvesting guidelines (Sec 11.2.2, 10-Year FMP).	Although the 1995 EIS does not specifically address residual effects of the LP growth and yield research program, it does describe expected stand regeneration based on species pre-harvest composition (see Tree Planting above). These effects are applicable to this research program in that they describe expected yield from harvested stands of deciduous, conifer, and mixedwood overstory, with the overall effect of regeneration of proportionally more mixedwood stands.	As part of its FMP, LP is establishing permanent sample plots in order to - Collect data that enables LP to monitor long-term ecosystem health; - Assess stand dynamics such as succession, regen and mortality in major forest cover types; - Develop relationships between stand structure, forest ecosystem classification (FEC), vegetation and soil types, wildlife habitat and biodiversity conservation attributes; - Provide representative areas for the study of forest management; - Using data to formulate yield curves and tables, timber supply models, etc (Sec. 7.6.4.17 , 20-Year FMP).	A lack of information noted in the 1995 EIS regarding knowledge of harvest impacts on herbaceous cover, understory vegetation and regeneration has been addressed in part by LP's ongoing Permanent Sample Plots (PSP) monitoring efforts (Appendix 2.1.7.6, 20-Year FMP). LP's commitment to incorporation of information produced by this monitoring effort will likely reduce residual impacts of harvest activities in the forest management area.	Language describing permanent sample plots in the 20-Year FMP now includes monitoring long-term ecosystem health, and recognizes the importance of PSPs representing forest types present in the FMP.	**Positive**	Application of data collected through ongoing PSP monitoring will continue to contribute to sound ecological forestry practices.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Ecological Monitoring	Ecological monitoring programs	The 10-Year FMP described a host of monitoring and research programs including study of forest insects and disease, regeneration and plantation surveys, mechanisms to ensure FMP complies with permits, compliance with legislation, policies and procedures, fire management. Tree improvement, growth & yield studies, and pre-harvest surveys (Sec. 11, 10-Year FMP).	Because the issue of LP accountability was widely raised during the EIS process, there is substantial need to ensure that the SAC is provided with adequate information to be able to monitor forestry operations and that a variety of activity records are maintained. The EIS also suggests the FMP proposed forestry activities will result in a number of possible impacts on the environment. To ensure a better information base for formulating future AOPs, LP should collaborate with MNDR, Environment Canada, DFO, CWS, academics and others in longer term environmental studies, with results of these studies published regularly (Sec. 10.1-2.4, 1995 EIS)	The 20-Year FMP describes a host of Forestry Effects Monitoring, including pre-harvest surveys, stream crossing assessments, harvest inspections, cutover photography, post-harvest assessments, Regeneration surveys, plantation assessments, and Forest certifications (Sec. 8.1, 20-Year FMP).	Many of the issues raised in the 1995 EIS regarding LP's monitoring efforts in the 10-Year FMP have been addressed in the 20-Year FMP. LP's commitment to continue the practice of adaptive forestry management in response to results of ongoing monitoring and research programs is indicative of their intent to manage the FMA responsibly and sustainably. Given this commitment and intent, LP's ecological monitoring programs will likely continue to improve their forestry practices throughout the course of the 20-Year FMP.	LP has increased the number and scope of monitoring programs imbedded within pre- and post-harvest surveys including research conducted by LP, collaboratively, or by means of LP funding research projects in the FMA.	**Positive**	The additional research and monitoring projects related to LP's 20-Year FMP feed back research data and trends that improve the quality of the forestry practices implemented by the Company.
Stand Tending and Enhancement	Stand Tending Techniques	LP will utilize stand-tending techniques including spacing or thinning of overstocked naturally regenerated stands/plantations and manual or chemical release of softwood species with competing vegetation (Sec 9.9.7, 10-Year FMP).	Direct effects of forestry chemicals include fish kills, delayed spawning, changes in animal physiology and histology, immobilization and bioaccumulation in fatty tissue. Indirect effects are seen in alterations of habitat including changes to riparian vegetation with the potential to alter stream flow, water temperature, light intensity, sediment loading, and changes in primary production. LP's SOPs, prescriptions for chemical use in stand tending, careful handling and slope-sensitive cutblock layout will jointly result in minimization of potentially adverse effects on riparian-zone wildlife, water quality, sediment loading, water temperature, and flow-rates (Sec 9.1.1.8, 1995 EIS).	LP will utilize stand-tending techniques including spacing or thinning of overstocked naturally regenerated stands/plantations and manual or chemical release of softwood species with competing vegetation (Appendix 2.2, Sec 6.14, 20-Year FMP).	No substantial change in wording or intent has occurred between the 10- and 20-Year FMP.	None	**Neutral**	No substantial change in wording or intent has occurred between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Herbicide Use	Herbicide Use	LP will attempt conifer release through temporary suppression of competing vegetation through the application of herbicide (Sec 9.9.8, 10-Year FMP).	Direct effects of forestry chemicals include fish kills, delayed spawning, changes in animal physiology and histology, immobilization and bioaccumulation in fatty tissue. Indirect effects are seen in alterations of habitat including changes to riparian vegetation with the potential to alter stream flow, water temperature, light intensity, sediment loading, and changes in primary production. LP's SOPs, prescriptions for chemical use in stand tending, careful handling and slope-sensitive cutblock layout will jointly result in minimization of potentially adverse effects on riparian-zone wildlife, water quality, sediment loading, water temperature, and flow-rates (Sec 9.1.1.8, 1995 EIS).	Where stand tending activities include herbicide treatments , LP will apply techniques that reduce potential impacts to aquatic environments including training and certification on herbicide use for personnel, use of ground-spraying techniques that allow for more control of application, and herbicide-free zones associated with buffers (Sec 7.2.1.2, 20-Year FMP).	This program is designed to monitor stand response to regeneration activities and may detect of impacts of those activities including application of herbicides, thereby reducing residual effects. Appropriate use of buffers and continued vigilance to monitor potential impacts of chemical use will likely reduce chances of potentially negative tending practices.	Wording and technique for herbicide application has been changed	Neutral	Maintenance of LP's intent to focussed use of herbicides will contribute to prompt renewal of forest stands in harvested areas, while minimizing potential negative impacts of chemical use in the FMA.
Forest Protection								
Fire Protection	Firefighting provisions	LP will undertake Debris Dispersal by minimizing slash to reduce fire hazard. Where slash is to be burned, it will be piled and burned on bare mineral soil, or during winter conditions. Burning for any reason will be postponed during periods of extreme fire hazard (Sec. 9.8.3, 10-Year FMP). LP will also maintain a Slash-free Fire Break Zone within five meters of uncut stands and all exclusion zones. All felled trees will be removed from the firebreak zone. Debris levels on adjacent uncut stands will be used as a measure for acceptable levels of accumulated debris in harvest areas (Sec. 9.8.4, 10-Year FMP).	There is no mention of residual impacts of LP's Fire Protection Practices in the 1995 EIS. LP's practices regarding fire protection are dictated by provincial standards set and regulated by the Forest Act and The Fire Prevention Act and Regulations.	LP will undertake Debris Dispersal by minimizing slash to reduce fire hazard. Where slash is to be burned, it will be piled and burned on bare mineral soil, or during winter conditions. Burning for any reason will be postponed during periods of extreme fire hazard (Sec. 7.6.1.6, 20-Year FMP). LP will also maintain a Slash-free Fire Break Zone within five meters of uncut stands and all exclusion zones. All felled trees will be removed from the firebreak zone. Debris levels on adjacent uncut stands will be used as a measure for acceptable levels of accumulated debris in harvest areas (Sec. 7.6.1.7, 20-Year FMP).	LP's Fire Fighting Provisions are designed to comply with the provincially regulated Forest Act and Fire Prevention Act and Regulations.	None	Neutral	No substantive change in wording or intent has occurred between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Insect and Disease Monitoring	Insect and Disease Monitoring	LP will help identify forest pests found during pre-harvest surveys and will work cooperatively on research projects to help Manitoba Conservation (MC): - Determine levels of insect populations. - Apply programs to reduce forest losses from insects and disease. Help in the various control activities carried out by MC to keep insect populations at minimum levels (Sec 11.1.1, 10-Year FMP).	Although the 1995 EIS does not address residual effects of insect and disease monitoring, it does evaluate LP's ability to continue to harvest sustainably despite significant land withdrawals due to fire, insect, or disease (see Salvage Operations below).	Pre- and post harvest surveys incorporate a forest health survey component (see discussion of IFPM program in Forest Health Objectives above). Data from these survey findings are provided to Manitoba Conservation's (MC) forestry branch. Government and LP personnel work together to develop response strategies (Sec 3.2.2, Sec 7.1.1.7, 20-Year FMP).	Depending on details of pre- and post-harvest survey design, it is possible that activities to protect forest health are appropriate to potential threats to forest health. LP/MC cooperative forest protection strategies may address these uncertainties.	The 20-Year mentions that pre- and post harvest surveys incorporate a forest health component.	Neutral	No substantive change in wording or intent has occurred between the 10- and 20-Year FMP. More detail from LP describing the degree to which insect disease and monitoring is included in surveys would be helpful.
Salvage Operations	Salvage Operations	According to the FMLA LP and the Province are responsible to ensure that damaged timber is used, if not by LP then by someone else. LP must ensure that other operators may access and use that timber. LP and the Province must jointly develop strategies, standards and policies to ensure the best and cheapest means of timber salvage when fire, insects, disease or any other such occurrence damages timber in FML#3 (Sec 8.3, 10-Year FMP).	Although the 1995 EIS does not address salvage operation per se, it does mention that LP's projected annual harvest would still be sustainable in spite of significant land withdrawals resulting from fire, insect of disease damage to the FML#3 area.	LP assists Manitoba Conservation by harvesting infected/infested stands, which ensures that the infection is eradicated and the area sanitized. The most common and effective approaches to pest control that LP is engaged in are salvage operations to mitigate losses due to insects and disease, and initiating the development of younger forests freer of pests (Sec. 3.2.2, 20-Year FMP).	LP's plans for salvage practices will likely reduce chances that infestations or infections will spread as readily throughout forest stands in the study area.	Change to wording in 20-Year FMP is minimal and does not indicate changes in LP's plan to implement salvage practices in the FMA.	Neutral	No substantive change in wording or intent has occurred between the 10- and 20-Year FMP.

Table 2: COMPARISON OF ENVIRONMENTAL EFFECTS OF 1995 10-Year FMP AND 2006 20-Year FMP

Objective, Strategy, Activity, or Procedure	Details	10-Year FMP		20-Year FMP		Change in FMP	Change in Effect Due to Change in FMP (colour coded)	Comments
		Proposed Practices	Residual or Uncertain Effects	Proposed Practices	Residual or Uncertain Effects			
Environmental and Ecosystem Maintenance	Environmental and Ecosystem Maintenance	Reforestation will be conducted to regenerate a logged area with similar species and composition. Pre-harvest surveys will contribute to protection of immature softwood understory to maintain a mixedwood component (Sec 9.9.9, 10-Year FMP).	Unassisted natural regeneration of forest overstory is not always possible in post-harvest situations. Harvesting hardwood forests will eventually result in the regeneration of similar hardwood species. Appropriate scarification methods can result in a more receptive seedbed for conifer species. Under certain conditions, re-establishment of a softwood forest may require manual re-seeding or replanting. If LP is successful in maintaining a component of conifer in the understory of hardwood stands, then it is likely that the conifer component of these stands will increase over time, creating more of a mixedwood forest (Sec 9.1.1.5.2, 1995 EIS).	Reforestation will be conducted to regenerate a logged area with similar species and composition. Pre-harvest surveys will contribute to protection of immature softwood understory to maintain a mixedwood component. These practices will be implemented at a landscape level, through silvicultural systems and treatments, which balance the ecology of the forest and the silvics of the tree (Sec. 7.6.4.2,20-Year FMP).	LP has undertaken research to address uncertainties regarding residual effects of the 20 yr FMP on soil quality, hydrology, hunting pressure on large game, Neotropical Migrant Birds, and marten. In addition, LP's commitment to speed regeneration as much as possible will likely reduce uncertainties about regeneration success. Continued research and conservative buffer and leave area practices, will likely increase understanding of and reduce impacts on understory tree and herbaceous vegetation regeneration. .	The 20-Year FMP includes language and intent to apply regeneration at a landscape scale.	**Positive**	LP makes a point of incorporating 'prompt forest renewal' as a strategy in the 20-Year FMP. Future research following harvest and regeneration may provide resolution of uncertainties about residual impacts on area sensitive wildlife species.
	Fragile Conditions Conservation	Fragile conditions such as fine textured soils, wet organic sites and steep slopes will be identified before harvesting. If forest renewal standards cannot be met because of fragile conditions of a site, then harvesting will be modified or prohibited on the site. Only Manitoba Natural Resources-approved tree, shrub, or ground species will be used for and reforestation activities in FML#3 (Sec 9.9.9, 10-Year FMP).	LP's FMP components, especially the AOPs and SOPs, are particularly attentive to potentially adverse effects of forestry practices on damage to fragile conditions. The FMP includes commitments to a variety of erosion prevention and sediment control measures. These commitments repeated to stakeholders (e.g., SAC), environment groups, and to Open House attendees are the basis for the conclusion that mitigation measures can reduce potential adverse effects of the FMP on existing erosion regimes to acceptably low levels (Sec 9.1.1.7.3, 1995 EIS).	Fragile conditions such as fine textured soils, wet organic sites and steep slopes will be identified before harvesting. If forest renewal standards cannot be met because of fragile conditions of a site, then harvesting will be modified or prohibited on the site (Sec 7.6.4.15, 20-Year FMP).	Residual effects of harvest activities in fragile conditions may be avoided by implementing these practices.	The 20-Year FMP omission regarding use of MC-approved reforestation shrub and herbaceous species reflects a change in the provincial prescriptions.	**Neutral**	Although wording and organization of topics has been changed in the 20-Year FMP, no substantive change in practice or intent has occurred regarding LP's intent to continue adjustments to harvest and site preparation where fragile conditions exist..