

7.0 Multiple Benefits of Forests to Society

7.1 Background

Multiple benefits of forests to society is a reflection of the need to develop forests in a sustainable fashion to maintain a flow of economic and social benefits to society. The intent of this criterion is to consider the economic and social benefits derived from the forests and the capacity of the natural resource and industrial bases to support these benefits.

The forests of FML 01 provide a variety of benefits to the people living in the FML area as well as from surrounding areas. The forest products sector continues to be one of the most important employers of Canadians and contributors to Canada's net exports (CPPA 1997). The forest industry is particularly important in rural areas where alternative economic opportunities are limited. As such, many rural communities are dependent to a large extent upon the forest sector for their economic well being (CCFM 1995). Economic benefits to the economy as a whole accrue through payment of wages and related spending, taxes, profits and other costs such as stumpage fees to the province.

Non-timber values, although not always easily measurable in monetary terms, are also very important in providing benefits to society. Canada's forests support a diverse variety of non-timber commercial opportunities and other activities and benefits including tourism, recreation, other resource harvesting, aesthetics and wildlife and other wilderness values (CCFM 1995).

Though sustainable in nature, forests are finite in extent, requiring that choices be made in their use and in what proportion, and how the resources will be utilized. To meet the goals of sustainable development these choices must consider how future demands will be met (CCFM 1997a).

Multiple benefits of forests to society can be viewed in the context of four elements:

- Productive capacity
- Competitiveness of resource industries
- Contribution to the national economy
- Non-timber values

Three matrices are utilized to cover multiple benefits to society and are presented at the end of this Section in Table 7, 8 and 9:

Table 7 Productive capacity, competitiveness of resource industries and contribution to timber and non-timber economies

Table 8 Non-timber values (one of two)

Table 9 Non-timber values (two of two)

7.2 Productive Capacity

7.2.1 Introduction

Productive capacity is reflected in the capability of the forested landbase to provide a sustainable level of benefits, derived from both timber and non-timber resources, to society. Resource harvesting, changes in land use and natural disturbances are balanced by regeneration and growth in evaluating the productive capacity of the forest. Components related to assessment of productive capacity are indicated in Table 7.

7.2.2 Data Adequacy and Gaps

FSP sources of information include:

- Description of the biophysical resources of FML 01 (Sections 3.1)
- Description of wildlife resources of FML 01 (Section 3.2)
- Sustainability analysis results for timber supply, incorporating consideration of values for forest ecosystems and wildlife habitat supply for FML 01 (Sections 4.1 and 4.3)
- Description of species at risk (Section 5.7)
- MC Forest Inventory including forest tree species and age class description (Section 5.9.4) and accompanying maps (Figure 5.26 and 5.27) and table (Table 5.16 and 5.17)
- FSP Development Plan proposals for timber harvesting, all-weather roads and permanent watercourse crossings (Sections 5.11, 5.12 and 5.13)

Other sources of information include:

- High Conservation Value Forest Assessment report (Kotak et.al. 2009)
- On-going update of MC Forest Inventory by Tembec and the Province including forest tree species and age, forest renewal projects, forest fires and insect infestations
- Manitoba FEC system in place for Provincial forest resource including FML 01

On-going Operational Data Sources include:

- PHA assessments including tree species, age class, FEC V-type, soils description and other values

These sources of information represent the best information currently available for assessment of productive capacity of the forests of FML 01. Regular updating of the MC Forest Inventory by Tembec for harvest and renewal activities and by the Province for forest fire and insect/disease depletions as well as for any changes in land use (WDS – 001) will continue to provide one tool for monitoring productive capacity. This information also provides Tembec and MC with the data necessary to undertake wood supply and wildlife habitat supply modeling which allows for projection of effects upon productive capacity resulting from updates to the forest inventory, land use and possible forest management regimes (FSP Section 4.1 and 4.3).

A number of indicators have been developed within the LLI framework which will provide information related to components of multiple benefits over time as the monitoring program is implemented. The application of these indicators will be described with reference to particular components and their interaction with forest management activities in describing the impacts.

7.2.3 Forest Management Activities Assessment

Planning

Planning of forest management activities has implications for the determination and application of sustainable timber harvest levels and thus the long-term productive capacity of FML 01. The processes utilized to determine harvest levels, in conjunction with the operating procedures relative to the modeling assumptions determine the nature and degree of impacts.

Public participation can provide a positive impact to the determination of the sustainable timber harvest through the participation of people of varying backgrounds, expertise and interests in developing information to be input and considered in sustainability modeling.

- In developing the LLI framework to derive values, goals, indicators and targets, a process of workshops and on-going public participation has been put into place (Tembec 2009), that among other values, includes interests relating to the determination of sustainable harvest levels. Interests incorporated in the modeling process, derived from the LLI process and other on-going public forums, includes wildlife as expressed through the inclusion of HSI models (FSP Section 4.1, 4.3 and 4.5), management objectives and targets for HSI habitat levels and species at risk (FSP Section 5.2.1.1.1 and 5.2.1.1.3). Interests in sustainable economic benefits of the timber industry, including employment, are reflected in the development of sustainable harvest levels over the long-term with a narrow range of variation in levels over time. Desires to incorporate interests of non-timber values including aesthetics and tourism/recreation are incorporated through the landbase netdown process to remove areas on which timber harvesting is not to take place (FSP Section 4.1). These areas include protected areas, provincial parks, wildlife management areas, treaty land entitlement areas, private and federal lands as well as through the application of watercourse and highway buffers in a strategic context across the landscape. These netdowns provide representation of these other values in determination of the sustainable harvest level, thereby providing for the application of a level of use that reflects long-term productive capacity given the variety of interests present on the landscape.
- The indicators to be monitored in terms of productive capacity in addition to other values represented in the LLI framework are derived from the public process and provide on-going measurement and reporting of this value.

Road and watercourse planning can have a significant impact upon the productive capacity of FML 01 in terms of the implementation of access development over the long-term that reflects the access requirements to harvest and renew areas of FML 01 to obtain the volumes established as sustainable through modeling analysis.

- Such development is described in the FSP (Section 5.13) relating to the strategic development of primary access infrastructure for the 20 year period covered by the plan. Subsequent to this stage, further refinement of primary access and planning for actual cutblock access is developed at the AORP stage to meet the harvest requirements for that year in terms of the sustainable harvest level.

Harvest and renewal planning can significantly impact upon the long-term sustainability of the productive capacity of FML 01. The selection of stands for inclusion in the harvest schedule for subsequent logging operations requires the incorporation of stand age and type correlating to the criteria utilized in the sustainability modeling analysis. Incorporation of harvest designs that consider non-timber values such as buffers and retention of in-block stand structure elements is needed to follow-up on the strategic decisions included in the modeling process relating to these components. Forest renewal processes and results must be in place to obtain the overall results anticipated in developing rules of succession and stand development in the modeling process.

- Cutblocks to be proposed in AORPs for harvest and renewal activities will correspond to the forest strata utilized to characterize the landbase in the application of the sustainability modeling. Harvesting of cutblocks will be designed and implemented to utilize stands making up the strata upon which the sustainability modeling results are based (FSP Section 4.4 and Table 4.3) This includes considerations of stand age as well as species composition.
- As described earlier, location and design of harvest areas can incorporate patch size distribution patterns in targeting harvest area size and shape, and utilize naturally occurring stand boundaries and retention of stand structure components to provide mitigation related to decisions utilized in the modeling process. Harvest areas will incorporate buffers and other leave areas to meet identified values as forecasted at a strategic level in the modeling process (WDS – 007, 010 and WDS-WI-003, 004, 005, 006, 007, 009 and 048)
- Prompt forest renewal of all harvested sites with suitable tree species to renew the area back to its previous condition, as outlined in Section 5.14.3 of the FSP, and required by MC, will provide mitigation to correspond to the related premise made in this regard in determining the sustainable harvest level.

Sustainability modeling, undertaken in the preparation of the FSP has a significant role relating to the implementation of timber harvest levels determined from sustainability modeling. The resulting harvest levels are utilized to guide the development of operating plans for implementation with the actual harvest levels leading to a direct effect on volumes available in the future. Long-term productive capacity will be influenced by the results and implementation of the modeling process.

- Results of the modeling are derived based upon an established current forest inventory and predictions growth and yield and forest succession following forest renewal activities.

These inputs to the modeling, and the modeling system itself, determine, to a great extent, the calculated sustainable timber harvest level, and thus, can lead to significant impacts on future forest composition and landscape patterns dependent upon their reliability.

- Mitigation during the modeling process occurs through:
 - Use of the best available data in developing predictions of forest succession and growth and yield for application in the model. Yield curves were developed by MC using data local to FML 01. Transitional pathways following harvest were predicted based on silviculture surveys conducted on FML 01 (FSP Section 4.1).
 - The model applied to FML 01 (Woodstock™ and Patchworks™) have been utilized in a number of applications across the boreal forest in Canada, in addition to its use in Manitoba. The sustainability modeling undertaken for FML 01 builds upon experience gained in previous modeling projects for FML 01 as well as other areas of Manitoba and elsewhere in the boreal forest.
 - The modeling process incorporates the use of wildlife habitat (based upon HSI models) values of the forest as displayed outputs to be reviewed and considered in determining a sustainable harvest level by MC (FSP Section 4.1) and implemented as targets through spatial modeling (FSP Section 5.2.1.1.1 and 4.3).
 - The modeling process incorporates the spatial cycling of habitat for the Owl Lake Woodland Caribou herd in determining a sustainable harvest levels (FSP Section 5.2.1.1.3 and 4.3).
 - The modeling process incorporates targets for the maintenance of old forests and large contiguous core forest areas in determining a sustainable harvest levels (FSP Section 5.2.1.1.1 and 4.3).
 - Re-curing analysis of the sustainable harvest level is undertaken every 20 years in association with the preparation of the FSP. Intermediate analysis will also be undertaken, as determined by MC, should major fire events result in a substantial change to the forest composition and age class structure from that which had been forecasted from the previous FSP modeling work. This adaptive management approach to determination of the sustainable harvest level allows for incorporation of improved forest succession and growth and yield data as time moves forward and future FSPs and associated modeling work is undertaken.
- Sustainability modeling provides positive impacts to planning processes enabling planning staff to undertake analysis to include a number of non-timber factors that would be difficult to incorporate in more traditional approaches. This enables planners to run a series of analyses inputting a variety of different constraints and objectives to achieve a suitable alternative. For the FSP modeling work inputs and resulting outputs for consideration included:

- Netting down of the available landbase to incorporate consideration of buffers providing reflection of non-timber values (FSP Section 4.1)
- Resulting habitat suitability index (HSI) units for representative wildlife species (FSP Section 4.5)
- The modeling results, as described in Section 4.3 of the FSP, indicate the sustainable harvest levels available for FML 01 for the upcoming 20 year period. These results, representing the long-term productive capacity of FML 01, were then utilized as a maximum in the preparation of the harvest plan for the FSP.
- As part of the LLI framework:
 - Indicator 1.1.1.1 tracks and reports on the percent of old forest area.
 - Indicator 1.1.3.2 tracks and reports on the percentage of the FML in large contiguous core areas
 - Indicator 1.2.3.1 tracks and reports on the maintenance of high habitat units within the Owl Lake woodland caribou winter management range
 - Indicator 5.1.1.1 tracks and reports on the adherence to the harvest sequence from the modeling process and utilization of the sustainable harvest level
 - Indicator 5.1.2.1 tracks and reports on the maintenance of wildlife habitat units for representative species

Information collection and application activities have a significant impact upon landscape level planning and results obtained through implementation. Information collected through various inventory, assessment and monitoring processes provides the basis for decision making from the stand level (e.g. mitigation for cutblock design) to the landscape level (e.g. sustainable harvest levels reflecting productive capacity). Processes must be in place to collect relevant information and to process and apply it to decisions.

- The Manitoba Forest Inventory provides full coverage of FML 01 with basic timber related data necessary for strategic level planning, including sustainability analysis for determination of sustainable harvest levels. This information is provided to Tembec as required under the FML Agreement with Manitoba and was utilized in the determination of sustainability for the FSP in co-operation with MC, who have primary responsibility for provision and updating of the Provincial inventory. The inventory is updated on a cyclical basis of approximately every 20 years with on-going annual updating for the effects of natural (fire, etc.) and harvest depletions. Intermediate updates are undertaken by MC in the event of major disturbances such as a severe fire year. MC incorporated stand age and height into the most recent inventory utilized for the development of the FSP. In addition a Provincial Forest Land Inventory Technical Advisory Committee (FLITAC) is in place to provide on-going recommendations for improvement of the inventory, including improved representation of non-timber values. Tembec is a participating member of this committee. Such improvements are important in the context of adaptive management and will provide improvements for application to sustainability modeling. On-going regular updating of the inventory by Tembec and MC is important to ensure that the modeling analysis (e.g.

sustainability and spatial sequencing), monitoring (e.g. forest composition, age class structure, etc.), and reporting activities that rely upon the inventory provide reliable results.

- The PHA program provides operational level information at the operating block and cutblock level. This program provides important information for application to non-timber and timber values, supplementing the information available from the Manitoba Forest Inventory, other provincial information sources, the Manitoba FEC, joint planning and other public participation processes. In terms of productive capacity, the PHA program assists in identification and confirmation of the applicable forest strata and yields for stands composing each cutblock prior to its inclusion in the AORP. This allows planning staff to schedule stands for harvest and renewal that are appropriate given the strata applied to the model in determining the sustainable harvest level (FSP Section 4.4).

Given the modeling approach for the determination of the sustainable harvest level and the inputs and contributing processes from public participation and information collection, the impacts associated with planning activities are mitigable, and in general, are positive for the productive capacity of FML 01.

Infrastructure Development

Infrastructure development can have an impact upon the productive capacity in terms of the ability of Tembec and other timber operators to utilize the available sustainable harvest level across FML 01. Determination of the sustainable harvest level is based upon the ability to access stands across FML 01 that are included within the strata and the netted down landbase upon which the volumes are determined. In this regard the development of infrastructure to provide this access is a positive impact. At the same time the construction of all-weather roads, as described earlier, results in the conversion of productive forest landbase to non-forest status.

All-weather roads have implications for the sustainability of the productive capacity of timber resources. Both in terms of the alteration to the site for the roadbed that removes this area from the productive landbase, and in terms of the increased access providing for utilization of stands across FML 01 allowing for utilization of the productive capacity.

- Construction of all-weather roads will result in some conversion of forest land to non-forest use in the case of permanent roads. Given the relatively small proportion of the landbase affected by this activity, as reflected by Indicator 1.1.3.3 which limits road development to 0.58 km/km^2 by watershed, the impacts are insignificant on a landscape basis.
- Management and development expenditures related to the construction of all-weather roads and related watercourse crossings have a positive impact upon productive capacity as the landbase available for cost effective resource harvesting and management activities is increased. This development is important in providing the access necessary to harvest and renew stands across FML 01 that meet the strata requirements relied upon in running the model to determine the sustainable harvest level. In terms of this component, opportunity for not only timber harvesting, but also other land uses such as wild rice

harvesting is improved. Within the LLI framework Indicator 5.1.3.1 has been established to track the volume of standing timber to which appropriate road access has been developed. This provides for monitoring of the accessed level of the total productive capacity at any given time.

- Construction of all-weather roads can have an impact upon the available habitat for some wildlife species as described earlier. Although some site-specific disturbances may occur these impacts are insignificant in a landscape context in terms of productive capacity.

Infrastructure development is an important activity to enhance the ability of Tembec and other timber operators to utilize the productive capacity of FML 01 in terms of the sustainable harvest level. On-going infrastructure development is required to allow for access to timber for harvest of stands meeting the strata requirements corresponding to decisions made in determining the sustainable harvest level during modeling analysis.

Harvesting

Harvesting activities has the potential for significant impact upon the long-term productive capacity of FML 01 through the harvesting and depletion of the standing timber resource. Determination, implementation and monitoring of a sustainable harvest level for application to harvesting activities in conjunction with the planning and implementation of forest renewal activities provides mitigation.

Logging activities in isolation could impact long term sustainable levels of timber resources through harvesting of the standing timber inventory. At the site level mitigation is achieved through prompt forest renewal of all sites harvested to stands similar to the original stand (FSP Section 5.14.3). At the landscape level mitigation is provided through determination of sustainable harvest levels through modeling processes as described earlier, which are then utilized as maximum harvest volumes in harvest plan development and operations. This process and the resulting sustainable harvest levels are described in the FSP (Section 4.3) for application to FML 01 during the 2010 to 2029 period. As described in the FSP, further refinement and re-calculation of these levels may be required in the event of any significant natural depletion (fire) events that occur during the 20 year period. This modeling process will then be repeated in preparation for the next FSP.

- In conjunction with the modeling and implementation processes, monitoring and reporting of actual harvest levels as compared to the sustainable levels as well as the harvest strata sequence determined during modeling will be undertaken as per Indicator 5.1.1.1 of the LLI framework. This will ensure that harvesting activities will not result in timber harvest levels that exceed the productive capacity of timber resources for FML 01.
- Logging activities have a similar potential for significant impacts related to productive capacity in terms of available habitat for wildlife. These impacts have been described earlier in this EIS. As noted, impacts vary dependent upon the habitat requirements of the various species. Mitigation is achieved at the site level through implementation of a variety of site level operating practices as outlined in the MC wildlife guidelines (MNR

1984) and the work instructions (WDS – WI – 003, 004, 005, 006, 007 and 048). At the landscape level the incorporation of HSI models to undertake projections of habitat supply resulting from various forest management alternatives allows for consideration of these concerns at the modeling stage within the determination of the sustainable harvest level. Management objectives have been established to maintain habitat levels within 90 % of the current HSI values (FSP Section 5.2.1.1.1) and in Section 5.2.1.3.3 to spatially model the harvest sequence in the Owl Lake caribou winter zone, as conducted in Section 4.3 of the FSP. As described earlier, within the LLI framework, Indicator 1.2.2.1 has been developed to track the levels of habitat units for the representative wildlife species selected for the FSP and Indicator 1.2.3.1 tracks the habitat units within the Owl Lake winter management zone as described in the landscape management strategy for the Owl Lake caribou herd (MBMF 2005).

Harvesting has the potential for significant impact upon the productive capacity of FML 01 for producing timber due to depletion of stands as they are harvested. Mitigation occurs at the landscape level through the application of modeling analysis to determine the sustainable harvest level. At the site level forest renewal activities are undertaken to renew all stands harvested as required by provincial regulations.

Forest Renewal

Forest renewal activities provide positive impacts in their role of complementing and accelerating the renewal of harvested stands to maintain the productive capacity of the forest in light of on-going harvesting and natural depletions.

Site preparation/scarification, tree establishment and mechanical and chemical stand tending, and related development expenditures will generally have a positive impact upon productive capacity for FML 01 in terms of harvest levels, the productive landbase and wildlife habitat. These activities promote a more rapid return of each harvested area to a forested stand thereby contributing to productive capacity.

Chemical stand tending, as described earlier, is used selectively to assist some stands to return to their previous dominant softwood covertime. This will have a long-term positive impact to species such as woodland caribou that are associated with areas of pure softwood covertime. In the shorter term this treatment can impact upon food (browse) for such species as moose in the specific area treated. Mitigation is achieved as described earlier, and in WDS – 014 and the FSP (Section 5.14.4.7 and 5.15), and includes design of the application area to include buffers and leave areas and the availability of browse and cover in adjacent areas.

Forest renewal activities provide positive mitigation to the potential impacts of harvesting upon the productive capacity of FML 01.

Forest Protection

Forest protection activities can influence the long-term sustainable levels of productive capacity, particularly in terms of fluctuations that could otherwise occur over time as a result

of the effect of natural disturbances, in addition to harvesting activities, on the age class structure of FML 01.

Insect and disease control and fire control activities and related expenditures will have a positive impact upon productive capacity for FML 01 in that these activities provide a balancing effect in terms of age class structure of the forest as related to harvesting activities. Directed towards areas of the forest with relatively high timber and non-timber values, these activities can moderate the fluctuations that may otherwise occur to the age structure and related productive capacity of the forest, while also providing direct protection to the identified values.

Forest protection activities assist in providing a positive impact upon productive capacity through protection of areas of identified high timber and non-timber values. This, in addition to forest renewal activities assists in balancing the potential impacts of harvesting upon the productive capacity of FML 01.

7.3 Competitiveness of Timber/Non-timber Resource Industries

7.3.1 Background

Competitiveness of timber/non-timber resource industries, is reflected in the ability of forest based industries to compete in the global marketplace. Competitiveness is related not only to the efficiency of an industry in utilizing capital, labour and raw materials, but also to the institutional, social, cultural and regulatory environment in which it operates (CCFM 1997a). A competitive forest based industry is important to provide a sustainable level of benefits in terms of jobs, incomes and taxes, derived from both timber and non-timber resources, to society. The competitiveness of these industries also determines their capacity to accommodate the higher costs related to sustainable forest management initiatives and industrial production (CCFM 1997a). Components related to assessment of competitiveness are indicated in Table 7.

7.3.2 Data Adequacy and Gaps

FSP sources of information include:

- First Nation Involvement (Section 2.1)
- Stakeholder involvement (Section 2.2)
- Socioeconomic analysis (Section 6.0)

Other sources of information include:

- Local Level Indicators of Sustainable Forest Management (Tembec 2009)
- Tembec 2008 Annual Report (Tembec 2009B)

On-going Operational Data Sources include:

- Sustainable Forest Management Advisory Committee

These sources of information represent the best information currently available for assessment of competitiveness for the forest based industries of FML 01. Very little information is available in economic terms for many of the non-timber forest activities that take place within FML 01.

7.3.3 Forest Management Activities Assessment

Planning

Planning activities determine the manner in which operations will be undertaken thereby impacting upon the competitiveness of both timber and non-timber resource industries. Up-front identification of values to be considered in planning must occur through public participation forums to act upon these values in terms that recognize their effect upon the competitiveness of the various resource industries. The collection of information relevant to these values will assist in making these decisions to undertake road development and harvest and renewal planning.

Public participation in the planning process for forest management activities has a positive impact upon both timber and non-timber economic activities by providing the forum for exchange and recognition of the values that the various parties have and the contribution that these values have in terms of competitiveness. Building an understanding of the factors that influence the competitiveness of each of the various resource industries assists the participants in working together, and in particular, contributing to the development of forest management plans. Various forums are in place to undertake these discussions including the First Nation and stakeholder involvement process undertaken in developing the FSP (Section 2.0), the on-going SFMAC, joint planning and other community forums and meetings with resource user associations and individual industries in FML 01 (WDS – 004). Within the LLI framework Indicator 5.1.4.1 provides tracking of involvement activities, Indicator 6.1.1.1 provides tracking on First Nation joint planning processes, Indicator 6.2.1.1 provides tracking on public and community involvement activities, Indicator 7.2.2.1 provides tracking on opportunities for first Nation incorporation of TEK and Indicator 7.5.2.1 provides tracking on initiatives to increase participation by Aboriginal communities.

As described in the FSP (Section 2.1), processes to integrate joint management and planning as part of the combined First Nation/Tembec FRM organization will assist greatly in promoting the integration of timber and non-timber values in developing forest management plans. Such integrated planning should facilitate opportunities to improve competitiveness of both timber and non-timber industries through up-front consideration of associated values at the outset of planning.

Road and watercourse crossing planning activities can have a significant impact upon the competitiveness of timber and non-timber resource industries relating to the location and the class of road (duration) selected for access routes throughout FML 01. As described for

productive capacity, access throughout FML 01 to areas of timber corresponding to the forest strata composing the sustainable harvest level is necessary for long-term competitiveness of timber operators. For non-timber resource industries, the location and class of roads can vary in terms of potential positive or negative impact dependent upon the type of industry. Consideration of the implications of road access upon these various industries requires input through public participation as described in WDS-004. For industries such as wild rice and commercial fishing where transportation of supplies in, and/or, products out, is a significant portion of operating costs the improvement in access provided by forestry roads provides a positive benefit. In the case of fly-in lodge operators and others whose business relies to some extent upon wilderness setting this access can be a negative impact which requires on-going input and joint planning to address. Departmental Procedure WDS – 009 describes approaches taken to incorporate other values in development of road development and access management plans to address these potential positive benefits and concerns. Such implications are described further under the section relating to non-timber values.

Harvest and renewal planning activities can have a significant impact upon the competitiveness of timber and non-timber resource industries relating to the location, design and scheduling of operating blocks and subsequent cutblocks throughout FML 01. As described for productive capacity, utilization of forest stands throughout FML 01 corresponding to the forest strata composing the sustainable harvest level is necessary for long-term competitiveness of timber operators. For non-timber resource industries, the location, design and scheduling of cutblocks can vary in terms of potential positive value or negative impact dependent upon the type of industry. Consideration of the implications of harvest and renewal planning upon these various industries requires input through public participation as described earlier and in WDS – 004. For industries such as wild rice and commercial fishing, harvest and renewal planning impacts may be relatively neutral, aside from the corresponding benefit of access. Outfitting and guiding for hunting may be positively impacted, as may others, where changes to the forest structure provide habitat conditions favourable for wildlife. Again, in the case of fly-in lodge operators and others whose business relies to some extent upon wilderness setting this disturbance can be a negative impact, which requires on-going input and joint planning to address, particularly in the short-term. Such implications are described further under the section relating to non-timber values.

Sustainability modeling impacts upon the competitiveness of timber-based economic activity due to the importance in the long-term of determining and applying a sustainable harvest level as described earlier in relation to productive capacity.

Information collection and application has implications for timber and non-timber industries in terms of mutual understanding of values and requirements that affect their ability to compete. In terms of Tembec's activity, Indicator 5.3.1.1 will provide for reporting of earnings before interest, taxes, depreciation and amortization, Indicator 5.3.1.2 will provide for reporting of return on capital employed, Indicator 5.3.1.3 will provide for reporting on return on shareholder equity and Indicator and Indicator 5.3.2.1 will provide for reporting on the number and value of contracts awarded to enterprises on FML 01.

Access management impacts upon the competitiveness of both timber and non-timber industries in a manner that relates back to the impacts upon these sectors of road and watercourse crossing planning.

- For timber-based operations the implementation of access management on specific roads or networks can have an insignificant impact related to the implications for potential future harvest or renewal activities in the areas accessed by the road, particularly where decommissioning of the road is required. Some related direct costs may also be incurred, both in terms of the access management works and any required follow-up to re-open a temporarily decommissioned road as applicable. Mitigation involves careful up-front investigation of timber resources and scheduling of operations. At the same time some positive benefits can be realized in terms of savings in road and crossing maintenance that would otherwise be incurred to keep the road in safe operating condition by decommissioning and closing routes that are no longer required for Tembec operations.
- For non-timber operations, the implementation of access management on specific roads or networks can have a significant impact in terms of the ability of operators such as wild rice, trappers and commercial fishermen to continue to access areas to which they have benefited from the improved access afforded by road development. This can change the economics of operation, particularly for those requiring the access for economical delivery of supplies and/or their product. Mitigation of this concern is based to a large extent upon the planning of access management in conjunction with the original planning for the location, class, scheduling and service life of the road. Incorporation of the values of non-timber operators, in the area accessed by the road, will be undertaken in determining these factors and any subsequent access management (WDS – 009 and the FSP Section 2.1 and 2.2). Positive impacts can also be realized through access management by limiting ongoing access into areas in which fly-in lodges and other operators, who rely to some extent on a wilderness setting, undertake activities. For these operations access management can be utilized in conjunction with harvest scheduling and design of harvest areas to provide mitigation for forest management activities in the area.

Planning activities, including incorporation of public input and knowledge, sustainability analysis and information collection and application, play a significant role in the competitiveness of the timber and non-timber industries. Up-front integration of interests in location, design and scheduling of operations to avoid costly mitigation after the fact can be achieved through public participation processes and sustainability modeling to examine alternatives.

Infrastructure Development

Infrastructure development has implications for timber and non-timber industries in terms of monies spent upon developing the infrastructure by the forest industry and the subsequent implications of the roads once they are in place.

All-weather, dry-weather and winter road and related watercourse crossings construction activities all have particular relevance to the competitiveness of the forest industry. These

activities all contribute to the economic output of the industry in terms of jobs created and capital and operating dollars spent into the economy. Given the planning considerations outlined earlier to enable the timber-based industry to access the sustainable harvest level, operating procedures outlined in the EMS and the activities proposed in the FSP, these activities will have a positive impact upon the competitiveness of the timber-based forest industry for FML 01.

All-weather, dry-weather and winter road construction can have varying impacts upon non-timber industry competitiveness dependent upon the industry being considered. As described in relation to planning of access, construction of roads increases access opportunities for various forest users including wild rice farmers and trappers to areas that may otherwise not be cost effective to harvest. These same roads can have negative impacts upon industries such as remote outfitters that prefer less access into the areas in which they operate. Due to their permanent duration, all-weather roads can have significant impacts in this regard while dry-weather roads, which are temporary in duration, have insignificant impacts. Mitigation of these concerns depends to a large part upon long-term planning and public communication of which this FSP process is a part.

As with other facets of access development, competitiveness of timber and non-timber industries are impacted to varying degrees dependent upon the direct benefits to each industry of the improved transportation route made available by each route. Mitigation requires incorporation of interests up-front in developing access routes and classes/duration of use.

Harvesting

Harvesting operations have implications for timber and non-timber industries in terms of monies spent upon these activities by the forest industry and the subsequent implications of harvested areas for the non-timber based industries.

Logging and slashing, woody debris management and timber transportation to mill activities all have particular relevance to the competitiveness of the forest industry. These activities all contribute to the economic output of the industry in terms of jobs created and capital and operating dollars spent into the economy. Given the planning considerations outlined earlier, operating procedures outlined in the EMS and the activities proposed in the FSP, these activities will have a positive impact upon the competitiveness of the forest industry for FML 01.

Logging activities can impact upon non-timber industry competitiveness on a site-specific basis where the two activities may come into conflict operating on the same landbase at the same time. This can often be mitigated, again through long-term planning and up-front communication, particularly with the affected other resource user. Through awareness of each party's plans and constraints, mitigation can often be worked out. Particular impacts and relevant mitigation for various land uses are reviewed later in this EIS.

Harvesting is a key part of forest management activities, with the efficiency of these operations playing a large part in the overall competitiveness of the operation as a whole.

Impacts upon non-timber industries can occur at the site level where facets of the timber operation are inconsistent with those of the non-timber industry operating in close proximity in terms of location and season. Participation of representatives of the non-timber industry during public participation processes to work with Tembec to develop mitigation at the planning stage is needed.

Forest Renewal

Forest renewal operations have implications for the timber-based industry in terms of monies spent upon these activities by the forest industry and the long-term importance of the renewal of the forest to provide a continuing source of fibre. Though not noted on Table 7, forest renewal activities and the resulting forest regeneration processes are of benefit to the non-timber industries over the long term for similar reasons.

Site preparation/scarification, tree establishment, mechanical and chemical stand tending activities all have particular relevance to the competitiveness of the forest industry. These activities all contribute to the economic output of the industry in terms of jobs created and capital and operating dollars spent into the economy. Given the planning considerations outlined earlier, operating procedures outlined in the EMS and the activities proposed in the FSP, these activities will have a positive impact upon the competitiveness of the forest industry for FML 01. Forest renewal activities also contribute to the long-term competitiveness of the industry in FML 01 and Manitoba through the renewal of the resource upon which the industry is based. These activities assist through the acceleration of the regeneration process on a given site and build upon and complement the natural regeneration process for FML 01.

Forest Protection

Forest protection operations have implications for the timber-based industry in terms of monies spent upon these activities by the forest industry and the importance of protecting areas for identified values. Though not noted on Table 7, forest protection activities and the resulting protection of areas of identified values are of benefit to the non-timber industries over the long term for similar reasons.

Fire control activities have relevance to the competitiveness of the forest industry. These activities all contribute to the economic output of the industry in terms of jobs created and operating dollars spent. Given the planning considerations outlined earlier, operating procedures outlined in the EMS and the activities proposed in the FSP, these activities will have a positive impact upon the competitiveness of the forest industry for FML 01. Fire control activities also contribute to the long-term competitiveness of the industry in FML 01 and Manitoba through the protection of the resource upon which the industry is based. These activities assist in retaining areas of identified value including those where capital monies have already been invested in infrastructure and other funds on information collection and planning effort as well as instances where harvesting operations have already commenced. In these situations investment in timber inventory has already occurred through harvesting operations

and stockpiling of cut timber. Protection of the resource protects such investment and thereby assists in the overall competitive position of the operation.

7.4 Contribution to the Timber and Non-timber Economy

7.4.1 Introduction

Contribution to the timber and non-timber economy is reflected in the contribution that forest management activities and non-timber industries make to the local, provincial and national economies. In addition to contribution to GDP, these activities provide stable employment and incomes and derived economic benefits to local rural communities, which is consistent with the principals of sustainable development (CCFM 1997a). Components related to assessment of competitiveness are indicated in Table 7.

7.4.2 Data Adequacy and Gaps

FSP sources of information include:

- Socioeconomic analysis (Section 6.0)

Other sources of information include:

- Ecosystem Based Management Pilot Project: Science Team Report, Summary Technical Report (MC 2002)

On-going Operational Data Sources include:

- EMS Public Involvement Procedure (WDS-004)

These sources of information represent the best information currently available for contribution to the local, provincial and national economies for the forest-based industries of FML 01. Very little information is available in economic terms for many of the non-timber forest activities that take place within FML 01.

7.4.3 Forest Management Activities Assessment

Planning

Planning activities determine the manner in which forest management operations will be undertaken thereby impacting upon the contribution that subsequent activities will make to the timber and non-timber economies. Up-front identification of values to be considered in planning must occur through public participation forums to incorporate these values in terms that recognize their effect upon the economies of the various resource industries. The collection of information relevant to these values will assist in making these decisions to undertake road development and harvest and renewal planning.

Public participation in the planning process for forest management activities has a positive impact upon both timber and non-timber economic activities by providing the forum for exchange and recognition of the values that the various parties have and the contribution that these values have in terms of various economic activities as described for competitiveness.

- Positive impacts to employment in FML 01 and the region and related economic contributions will result through on-going benefits of public participation in the planning process. Such participation enables Tembec to gain input from communities regarding their economic interests related to both timber and non-timber pursuits and work with interested parties to further these interests through joint planning. This promotes the opportunity to develop forest management options that are mutually beneficial and develop mitigation for those activities on the landbase that are not compatible. Within the LLI framework Indicator 5.1.4.1 reports on involvement activities with First Nations, local communities and the forest and non-forest based industries.
- Public participation forums, particularly the joint planning process, can have a positive impact in terms of subsistence forest uses. Planning of forest management activities that can impact upon gathering, fishing, hunting and other activities used as means of support derived from the forest can be positively affected through incorporation of these values for affected areas at the planning stage. Joint planning, in particular, provides the opportunity for site specific concerns to be addressed.

Road and watercourse crossing planning activities can have a significant impact upon the contribution of forest management activities to timber and non-timber activities relating to the location and the class of road (duration) selected for access routes throughout FML 01.

- As described for productive capacity, access throughout FML 01 is necessary for long-term performance of timber operators. For non-timber resource industries, the location and class of roads can vary in terms of potential positive value or negative impact dependent upon the type of industry. Consideration of the implications of road access upon these various industries requires input through public participation involvement in the development of road development and access management plans (WDS – 009) as described earlier. For industries such as wild rice and commercial fishing where transportation of supplies in, and/or, products out, is a significant portion of operating costs the improvement in access provided by forestry roads provides a positive benefit. In the case of fly-in lodge operators and others whose business relies to some extent upon wilderness setting, this access can be a negative impact, which requires on-going input and joint planning to resolve. Such implications are described further under the section relating to non-timber values.
- In terms of subsistence forest uses planning of access development can have a varying degree of impact, providing improved access for people to undertake various activities in the forest, while resulting in some impacts to site specific values, dependent upon road locations and class. Joint planning with communities and individual users to identify specific areas of values for incorporation at the planning stage provides for mitigation and described in further detail related to particular uses later in this EIS.

Harvest and renewal planning activities can have a significant impact upon the contribution of forest management activities to timber and non-timber activities relating to the location, design and scheduling of operating blocks and subsequent cutblocks throughout FML 01.

- As described for productive capacity, utilization of forest stands throughout FML 01 corresponding to the forest strata composing the sustainable harvest level is necessary for long-term operations and corresponding economic benefits from timber operators. For non-timber activities, the location, design and scheduling of cutblocks can vary in terms of potential positive value or negative impact dependent upon the type of activity. Consideration of the implications of harvest and renewal planning upon these various activities requires input through public participation as described earlier and in WDS – 004. For industries such as wild rice and commercial fishing, harvest and renewal planning impacts may be relatively neutral, aside from the corresponding benefit of access. Outfitting and guiding for hunting may be positively impacted, as may others, where changes to the forest structure provide habitat conditions favourable for wildlife. Again, in the case of fly-in lodge operators and others whose business relies to some extent upon wilderness setting this disturbance can be a negative impact, which requires on-going input and joint planning to address, particularly in the short-term. Such implications are described further under the section relating to non-timber values.
- In terms of subsistence forest uses planning of harvest and forest renewal activities can have a varying degree of impact, providing improved conditions for growth of some plants such as blueberries for gathering activities and improved habitat conditions for wildlife such as moose for hunting. Negative site specific impacts on subsistent forest uses may result, dependent upon cutblock location and season of harvest. Joint planning with communities, SFMAC and individual users to identify specific areas of values for incorporation at the planning stage provides for mitigation and are described in further detail related to particular uses later in this EIS.

Sustainability modeling impacts upon the contributions to the economy, including employment, of timber-based economic activity due to the importance in the long-term of determining and applying a sustainable harvest level as described earlier in relation to productive capacity. The determination and application of a sustainable harvest level is important to allow for continued economic benefits derived from forest management activities across FML 01.

Information collection and application has implications for timber and non-timber economies in terms of mutual understanding of values and requirements that affect the ability of the various economic sectors to compete and grow. The LLI process initiated for the preparation of the FSP has provided a forum for this process that will be continued through various public participation forums on an on-going basis. In terms of timber-based activity, Indicator 5.2.1.1 of the LLI framework will provide a monitoring mechanism for Tembec to track the number of jobs resulting from on-going forestry operation of the Tembec. Indicator 5.2.1.2 will track the number and value of contracts awarded to enterprises in FML 01. Through Indicator 7.4.1.1, Tembec will report on the number of First Nation people employed

by Tembec forestry operations, Indicator 7.4.1.2 will report on the number and value of contracts awarded to First Nation contractors, Indicator 7.4.2.1 will report on training and opportunity programs for First Nation communities and Indicator 7.4.3.1 will report on support towards the establishment of timber and non timber resource industries.

Access management impacts upon the contribution to both the timber and non-timber economies in a manner that relates to the impacts upon these sectors from road and watercourse crossing planning.

- For timber-based operations the implementation of access management on specific roads or networks can have an insignificant impact related to the implications for potential future harvest or renewal activities in the areas accessed by the road, particularly where decommissioning of the road is required. Some related direct costs may also be incurred, both in terms of the access management works and any required follow-up to re-open a temporarily decommissioned road as applicable. Mitigation involves careful up-front investigation of timber resources and scheduling of operations (WDS-010 and FSP Section 4.3). At the same time some positive benefits can be realized in terms of savings in road and crossing maintenance that would otherwise be incurred to keep the road in safe operating condition by decommissioning routes that are no longer required for Tembec or other timber operations.
- The implementation of access management on specific roads or networks can have significant impacts in terms of the ability of operators such as wild rice, trappers and commercial fishermen to continue to access areas to which they have benefited from the improved access afforded by road development. This can change the economics of operation, particularly for those requiring the access for economical delivery of supplies and/or their product. Mitigation of this concern is based to a large extent upon the planning of access management in conjunction with the location, class, scheduling and service life of the road. Incorporation of the values of non-timber operators in the area accessed by the road will be considered during subsequent access management planning (WDS – 009 and the FSP Section 2.1 and 2.2). Positive benefits, including employment opportunities, can also be realized through access management that limits access into areas in which fly-in lodges and other operators, who rely to some extent on a wilderness setting, undertake activities. For these operations access management can be utilized in conjunction with harvest scheduling and design of harvest areas to provide mitigation for forest management activities in the area.
- For subsistent forest uses the implementation of access management on specific roads or networks can also have significant impacts in terms of the ability of people to continue to access areas to which they have benefited from the improved access afforded by forest road development. Mitigation of this impact is based to a large extent upon access management planning, in conjunction with the location, class, scheduling and service life of the road. Incorporation of subsistent forest use values in the area accessed by the road, will be undertaken through community input in determining these factors and any subsequent access management (WDS – 009 and the FSP Section 2.1 and 2.2). Positive benefits can also be realized through access management that limits continued access into

areas in which subsistent forest uses are on-going, by limiting the availability of the area for others to utilize the resources.

Planning processes, including incorporation of public input and knowledge, sustainability analysis and information collection and application, play a significant role in contributing to the timber and non-timber economic sectors. Up-front integration, through public participation processes and sustainability modeling, of economic and non-timber values in location, design and scheduling of operations can avoid costly mitigation.

Infrastructure Development, Harvesting, Forest Renewal and Forest Protection

Infrastructure development, harvesting, forest renewal and forest protection activities have implications for timber and non-timber economies. Implications arise in terms of monies spent upon developing the infrastructure by the forest industry, operating monies spent in undertaking the various forest management activities that follow and the subsequent implications of roads and cutblocks once they are in place for non-timber economies and subsistent forest users.

Road construction and maintenance, harvesting, forest renewal and forest protection activities all contribute to the GDP and to the creation of employment in FML 01. As described in Section 6.0 of the FSP, economic analysis indicates that these activities make a very positive contribution to the local, and indeed, the provincial economies.

At the present time, timber harvesting, road construction and maintenance, delivery of timber and forest renewal projects provides seasonal employment of about 260 jobs on the FML. Many of these seasonal jobs are filled by the same individuals year after year, particularly in harvesting and delivery operations. For many, this work serves as the principal source of income for these employees and their families.

All-weather and dry-weather roads can have varying impacts upon non-timber economies dependent upon the sector being considered and the class of road. Construction of roads increases access opportunities for various forest users including wild rice farmers and trappers to areas that may otherwise not be cost effective to harvest. These same roads can have negative impacts upon industries such as remote outfitters that prefer less access into the areas in which they operate. Such impacts are more significant for all-weather roads with the associated permanent duration of use as compared to dry-weather roads in place for a temporary period with follow-up decommissioning (WDS – 006). Mitigation of these concerns depends to a large part upon long-term planning and public communication of which this FSP process is a part. Though important on an individual site-specific basis, up-front planning with particular attention to joint planning and communication with resource users provides mitigation at a landscape level (WDS – 009 and FSP Section 2.1 and 2.2).

All-weather, dry-weather and winter roads can all result in insignificant impacts in terms of the creation of improved access into the areas of interest to subsistent forest users. Such access can result in increased use of resources in the area generally by other parties with increased

pressure on resources. Mitigation is achieved through incorporation of identified uses for each area in the development of appropriate access management at the planning stage (WDS-009). At the landscape level, road access to FML 01, as a whole, is limited through the application of a management objective (FSP Section 5.2.1.3.2) which limits the maximum density of roads to 0.58 km/km^2 , for FML 01, as described as the target for Indicator 1.1.3.3 of the LLI framework.

Logging activities can impact upon some non-timber economic sectors on a site-specific basis where such activities may come into conflict while operating on the same landbase at the same time. This can often be mitigated, again through long-term planning and up-front communication, particularly with the affected non-timber resource user. By both parties' being aware of the others plans and constraints, agreement and mitigation can often be worked out through awareness of the plans of each party. Particular impacts and relevant mitigation for various land uses are reviewed later in this EIS.

Logging activities can impact at a site level, upon subsistent use of forest resources. As described above, and later in this EIS, for the applicable individual land uses, these impacts will vary dependent upon the activity concerned. A variety of activities including joint planning and other communication with the public, long-term planning, sustainability analysis and site-specific operating procedures as outlined in the FSP and EMS can provide mitigation for the impacts of logging activities upon subsistent uses of the forest.

7.5 Non-timber Values

7.5.1 Background

Non-timber values, is reflected in the range of non-timber benefits available from the forest, not only in terms of each benefits' importance, but also the level of utilization that is occurring. These benefits are represented through the components in Tables 8 and 9 (Non-Timber Values 1 of 2 and Non-timber Values 2 of 2).

Information to assess the importance and use of non-timber benefits is often difficult to obtain, particularly in quantitative terms. Few Canadian studies of recreational forest values have been undertaken (Boxall, 1996). Assessing non-timber values using only quantitative measures is problematic as this can preclude other values from being considered into the planning process in an integrated fashion. Bidinosti (1998) suggests that economic assessment methods can result in commodity values dominating the decision making process.

Some of these benefits are quite specific in terms of potential locations and nature of impacts such as agriculture, wild rice, fishing and mining. Others are more dispersed such as hunting and tourism. Values such as special places and enduring features have value to many people who will never visit the area but want assurance that the forest values are being maintained.

Economic returns from commercial forestry operations and from non-timber values are recognized as important and useful indicators of sustainable development of forest ecosystems (van Kooten, 1995).

The general focus of the review in terms of non-timber components will be related to the potential impacts upon these values that the implementation of the FSP and associated forest management activities are expected to have. As with wildlife populations, many of these components are affected by a number of factors beyond forestry activities. These activities include the land use, provincial regulations and enforcement and other forest ecosystem changes occurring as a result of natural processes and disturbances and other land use activities.

7.5.2 Data Adequacy and Gaps

FSP sources of information include:

- Biophysical and land use descriptions (Section 3.0) and management activities on adjacent land (Section 5.9.1) including:
 - Provincial road network
 - Railways
 - Cottage areas
 - Fishing
 - Wild rice
 - Hunting
 - Trapping
 - Lodges and outfitting
 - Snowmobiling
 - Canoeing and designated waterways
 - Tourism
 - Mining
 - Special Places
 - Protected Areas

Other sources of information include:

- On-going use of the Sustainable Forest Management Advisory Committee (SFMAC) to provide two-way communication between Tembec and the various representatives of the non-timber resource values for FML 01 (FSP Section 2.2.6)
- Joint planning with local communities (FSP Section 2.1.2)
- Stakeholder involvement processes (FSP Section 2.2)

On-going Operational Data Sources include:

- PHA including identification of other values for consideration in developing mitigation

These sources of information represent the best information currently available for the non-timber values of FML 01. As indicated earlier, information regarding non-timber values can be difficult to assemble due to a general lack of data regarding their cost and use (CCFM 1997a).

As described earlier, the Company has initiated a PHA program to be undertaken on all sites prior to harvest (WDS – 002) and pre watercourse crossing assessments (WDS-003). This information will continue to build the knowledge base for non-timber values identification and related planning decisions into the future.

7.5.3 Forest Management Activities Assessment

7.5.3.1 Introduction

To cover the range of non-timber values in this assessment each component from the matrix presented in Tables 8 and 9 will be reviewed individually based upon the forest management activities applicable to that component.

7.5.3.2 Provincial Road Network

Road infrastructure to and within FML 01 includes a variety of provincial paved and gravel, all-weather roads with municipal road networks in the vicinity of communities. A winter road system is established each year to access communities on the east side of Lake Winnipeg without year-round road service.

Tembec also builds additional access road infrastructure to expand access from the provincial network out into operating areas for harvesting, wood delivery and forest renewal activities. Such roads are built to specifications allowing for transport of loads equivalent to those of the provincial network to which they connect. The responsibility for development and associated costs of this additional infrastructure to be utilized for forest management activities is borne by Tembec.

Tembec utilizes the provincial road access infrastructure for delivery of harvested wood as well as other raw materials to the mill manufacturing facilities at Pine Falls. In addition, finished products are transported to customers using this network. Where it is deemed that additional road infrastructure will serve dual purposes in terms of providing access for forest management as well as for access to communities, the Company and the Province may jointly develop such routes. Such was the case for the Lake Winnipeg East Road (formerly referred to as the Rice River Road), which was originally jointly constructed by Manitoba, Canada and the Company and has recently been transferred to Manitoba (FSP Table 5.4) for the development of a provincial trunk highway to access communities on the east side of Lake Winnipeg.

Provincial roads are impacted through the addition of access entrance points for connection of Tembec roads to the provincial infrastructure and increased use for forest worker, equipment

and timber transport and public use. The benefits include extension of the total available road network through the development of new forest access roads across FML 01.

Planning

Planning of main access roads can impact provincial roads through the location of access entrance approaches with the provincial road network. Entrance from and onto the provincial network and use of the provincial roads by vehicles transporting workers, supplies and equipment and the wood haul to the mill location has implications for traffic and a potential nuisance factor.

Road and watercourse crossing planning can result in insignificant impacts to the provincial road network related to the location of highway entrances to this network. As a result of the slowing and turning of wood haul trucks and other vehicles at these entrance locations a nuisance can be created for other vehicle users of the provincial road.

- Along with forest industry truck and other vehicle traffic, there will be an increase in traffic in the vicinity of these entrances from public use of the forest access roads.
- In the vicinity of these entrances some level of nuisance or inconvenience can occur for other public travelers created by slowing and turning vehicles and those resuming speed on the provincial road. Related to this situation public safety at these intersection locations can also be a concern due to potential for collisions.
- Given the limited extent of these potential impacts to the immediate vicinity of highway entrances and considering the duration and frequency in terms of resident time of forest industry traffic slowing, turning and resuming speed these impacts are insignificant. Mitigation is developed at the planning stage through application of several processes as described in WDS – 006 and 009 and the FSP Section 5.13:
 - To the extent possible, existing intersections with provincial roads will be utilized where available to avoid construction of new intersections.
 - Road management plan areas are designed with one primary access point which limits the potential number of highway entrances.
 - Planning and designing forest industry roads and highway entrances to appropriate standards considering wood volumes to be accessed, environmental standards, public safety, duration and frequency of use, and potential desired use of the road and entrance by non-timber users and related access management requirements.
 - Application process for appropriate Highway Entrance Permits from the Manitoba Infrastructure and Transportation including design of approach and intersection points of access roads with provincial roads considering, slopes, visibility, road curvatures, adjacent land use and human habitation. Through this process the location and design

of entrances, is reviewed and approved by Manitoba Infrastructure and Transportation.

Access management can have a positive impact on the provincial road network through provision of control of the increased public use of the road network.

- Through the development of new road infrastructure and linkages to the provincial road network, public access is increased for a variety of uses including, hunting, fishing, tourism, and other recreation opportunities. Consideration of non-timber values at the planning stage to define an appropriate access management plan for the route can assist in overall management of the desire to access these resources in balance with wildlife and other resource values.

Infrastructure Development

In addition to the access to operating areas provided by the development of new road infrastructure, Tembec roads can also provide the benefit of improved access opportunities for specific communities in FML 01. This is particularly the case for several communities currently accessed annually by winter roads on the east side of FML 01.

All-weather road development, and in particular the Lake Winnipeg East (LWE) Road development, can have a potential positive impact through the provision of improved access to several communities on the east side of Lake Winnipeg through its incorporation into the Provincial winter road network. The LWE Road has recently been transferred to Manitoba and will be upgraded to Provincial PTH standards under the East Side Road Authority, which is developing a PTH to Bloodvein and Berens River First Nation communities and proposing further highway development plans for the communities to the north and east of Berens River First Nation. This proposed road development will provide year round access for people and goods to these communities where access is currently limited to the winter road network through expansion of the current provincial network.

Harvesting

Harvesting activities involve the transportation of workers and equipment to the operating site and timber to the mill. This activity, most particularly the delivery of timber, involves travel via Tembec roads as well as the provincial road network.

Timber transportation to mill may represent a significant impact to the provincial road network with mitigation developed through the planning process as described above considering factors such as location of approaches to the provincial network, season of delivery, and safety. Further mitigation is provided through the safety considerations required of truck operators by Tembec for timber deliveries, including inspection of vehicles, observance of provincial weight allowances and safe operation as outlined in WDS-049.

Provincial roads are primarily impacted through planning of forest access road construction and increased utilization from timber transport, particularly at intersection points of the forest

access system with the provincial road system. Mitigation is achieved through application processes and joint review of proposed entrances with Manitoba Infrastructure and Transportation during the planning stage. Positive impacts are from the extension of the existing provincial road network through forest access road development, particularly the upgrading of the LWE road to PTH standards which will improve the winter road access currently provided to remote communities north of the FML.

7.5.3.3 Agriculture

Due to the soil and land drainage conditions throughout FML 01, agricultural activities are quite limited given the overall size of the area. East of Lake Winnipeg and north of the Winnipeg River the conditions presented by the Precambrian Shield do not lend themselves to agricultural activities.

Harvesting

Harvesting activities proposed in the FSP are planned for lands whose status is classified as *Forest Management License, open crown land* in the MC Forest Inventory, separating these areas from an *agriculture land* classification as a different status in the forest inventory.

Logging operations planned adjacent to agricultural lands, incorporate planning procedures including public communication through the stakeholder involvement processes identified in Section 2.2 of the FSP. Modification of harvesting practices resulting from stakeholder involvement provides mitigation for potential impacts.

- Retention of understory vegetation and prompt follow-up forest renewal of logged areas adjacent to agricultural lands will provide mitigation such that any potential impacts will be insignificant.
- In another regard, logging activities often provide seasonal winter employment opportunities for people who work in the agricultural sector during the spring to fall of each year, providing a positive impact by supplementing their farm income.

7.5.3.4 Fishing

Commercial fishing is undertaken in Lake Winnipeg which is situated on the west side of FML 01. A quota entitlement system is utilized by MC to manage the fishery resource on a sustainable basis. On Lake Winnipeg the quota entitlement is distributed into community licensing areas, each of which includes a number of communities. Fish species catch on Lake Winnipeg is governed by multi-species quota entitlement based upon pickerel, whitefish and sauger.

The lakes and rivers, particularly on the east side of FML 01, provide habitat for a variety of freshwater fish species, forming the basis for the sport fishery in the area. On a provincial basis the lakes and rivers of Manitoba support a substantial level of sport fishing, both in terms of resident-based recreational fishing and commercial sport fishing, relying primarily on non-

resident anglers. Primary species include in decreasing order, pickerel, northern pike, catfish, perch, lake trout and stocked species smallmouth bass and trout. Commercial sport fishing, in conjunction with hunting, forms the basis for much of the outfitting and lodge business throughout FML 01 and other areas of Manitoba.

Impacts from activities generally relate to the level of fishing pressure on fish populations in individual lakes. Increased public access to new lakes provided by road development is positive for fishing opportunity.

Planning

Planning activities can have impacts related to fishing in terms of the integration of these commercial and sport fishing values into the planning process to recognize and mitigate facets of forest management that can influence fishing opportunities.

Public Participation has a positive impact for fishing through joint planning, user group discussions, SFMAC and other forums. Information from these activities can be used to assist in location and design of access in the vicinity of identified fish-bearing waterbodies including access to previously inaccessible lakes, which increases fishing opportunity. Discussion with MC will take place to identify lakes and rivers of potential concern and incorporate this information into the overall road planning for the area (WDS – 009).

Road and watercourse crossing planning can have impacts to fishing through provision of additional access to currently utilized lakes and new access to other lakes. The location, design, classification and scheduling of roads can have significant impacts on those lakes already accessed by increasing the fishing pressure and may significantly or positively impact through providing new access to other lakes. Increased access may lead to fishing pressure that can significantly impact fish populations in the newly accessed water bodies leading to decreased fishing success if not managed.

- Mitigation can be achieved through the use of long-term plans such as the FSP to enable Tembec and MC to work jointly, with input from other resource users, to develop forestry road management plans (MC 2005B) which includes routes and road classes (all-weather, dry-weather or winter only) in addition to specific access management plans, as applicable to each situation.
- Up-front planning as provided through the FSP strategic planning process with follow-up detailed information in association with AORP preparation allows MC lead time to implement fishing quotas and angling catch limits for specific lakes anticipated to be impacted by the new access. This can be utilized in conjunction with access management plans for each route to mitigate potential concerns related to excess fishing pressure.
- As noted above, in planning routes and class of road, improved access to lakes and rivers can provide a positive benefit in terms of fishing opportunity to sport fishermen to gain entry to new areas and improved access to previously difficult to reach sites. In general, the forest industry road network is a major factor in the facilitation of access for the variety

of other resource users sportsmen, providing access many areas that otherwise would be unavailable, except to fly-in operators.

Information collection and application may significantly impact fishing through information used to make planning decisions. Information must be current and accurate to make informed decisions.

- Measures such as use of information collected during PHA, in addition to that provided by MC, to locate road routes away from sensitive sites, such as spawning areas (WDS – 002) will assist in mitigation of potential impacts.

Access Management and public use of roads constructed by the forest industry can provide more opportunity for commercial, recreational and sport fishing by increasing access to new areas, while also managing such access to maintain the viability of populations on a sustainable basis.

- New roads that improve access to previously difficult to reach areas can help to distribute angling pressure. At the same time, increased public access can significantly impact fish populations in individual lakes due to increase in fishing pressure.
- Mitigation is developed through planning activities as outlined above as well through the development and implementation of a road management plan prepared in conjunction with the FSP operating areas and refined with submission of each subsequent AORP. Indicator 5.1.3.2 of the LLI tracks the development and implementation of road management plans for FML 01. These plans will include road management strategies to be implemented for proposed access routes arrived at through joint planning and other public forums.

Infrastructure Development

All-weather and dry-weather road development will increase fishing opportunity through increased access and availability for public use as described above.

Harvesting

Harvesting activities can impact recreational and sport fishing activities where operations occur in close proximity to waterbodies as a result of changes to the aesthetics of the landscape.

Logging operations undertaken by Tembec include VRL techniques including retention of residual understory vegetation, protection of in-block drainage, use of buffers along lakes and rivers, cutblock design and season of harvest (WDS – 010, WDS-WI-006, 007, and *Guidelines for Riparian Management* (MC 2008) to provide mitigation with respect to these impacts as determined through identified values for each waterbody.

- Prompt forest renewal (FSP Section 5.14.3) to enhance natural regeneration and accelerate *green-up* of the landscape assists further in this regard. These practices, in addition to the short-term duration of these disturbances for a given site, (until green-up following forest renewal), result in impacts that are insignificant across the landscape.

Forest Renewal

Forest renewal activities, as described above, have a positive impact upon fishing values in that prompt renewal of each site provides for faster *green-up* time for improving aesthetics on the landscape for areas in close proximity to waterbodies.

Site preparation/scarification and tree establishment treatments are applied by Tembec as appropriate to site conditions to meet the Company's commitment to forest renewal of all areas harvested as provided for under the FML Agreement with the Province of Manitoba.

- Indicators 2.1.2.1 and 2.1.2.2 of the LLI track harvested areas successfully reforested and certified as achieving site renewal targets at 7 year regeneration survey and 14 year FTG survey.

Forest Protection

As with forest renewal activities, fire protection, has a positive impact upon recreation and sport fishing values in that this activity will assist in maintaining the aesthetic values in areas utilized for these purposes.

Commercial and sport fishing are significant contributors to the economy of Manitoba. Impacts relate to the increased access provided by forest access roads. The increased access provides new opportunity for fishing in previously inaccessible lakes and rivers. This can result in decreased fishing pressure on some lakes and rivers while re-distributing overall fishing pressure to others. Impacts are mitigated through planning with MC, the SFMAC and other user groups to control improved and new access to water bodies. Aesthetic values for the sport fishing experience are impacted through timber harvesting adjacent water bodies and are mitigated through VRL and prompt forest renewal.

7.5.3.5 Wild Rice

Wild rice harvesting is almost exclusively undertaken on the east side of FML 01 with minor activity on the west side (Peckett 1999). Wild rice harvesting provides a resource activity for people who grow wild rice for domestic consumption or harvest this product for commercial sale. Regulation of wild rice seeding and harvesting is undertaken by MC Lands Branch through issuance of development and production licenses to parties wishing to participate in this industry. Harvesting success is very closely dependent upon growing season, weather conditions and lake water levels with related seasonal irregularities in employment and crop values (Peckett 1999).

The wild rice industry can benefit from forest management through increased access. Potential impacts are possible through the use of chemicals for stand tending and insect and disease control.

Planning

Planning activities can have impacts related to wild rice farming in terms of the integration of this value into the planning process to recognize and mitigate facets of forest management that can influence wild rice opportunities.

Public participation, road and watercourse crossing planning and access management can have positive impacts to the wild rice industry related to the access opportunities to waterbodies providing expanded wild rice growing locations.

- Public participation during the planning process provides opportunities for those in the wild rice industry to be aware of planned access infrastructure enabling these individuals to become involved in the development of future access management decisions for the area.
- Road and watercourse planning, as part of the up-front planning process, allows participants in the wild rice industry to be aware of planned future expansion of road routes at the strategic FSP and the annual AORP levels.
- Public use of the roads constructed by Tembec provides improved access opportunities for people engaged in the wild rice industry. These roads and the available access can result in positive benefits through decreased costs in accessing lakes for seeding and transportation of their product to market. By being aware of planned road infrastructure development as well as participating as a non-timber resource user in the development of access management plans and decisions for each area, wild rice farmers can play a role in access planning in terms of its effect on their industry.

Infrastructure Development

All-weather and dry-weather road development will increase wild rice growing opportunities through increased access and availability for public use as described above.

Forest Renewal

Forest renewal activities related to the application of herbicide products during chemical stand tending have the potential to be of concern to wild rice growers. Where these activities are undertaken in proximity to waterbodies utilized for growing wild rice there is a potential for contamination of the wild rice.

Chemical site preparation and chemical stand tending activities, as described earlier, have potential to insignificantly impact surface waters when applied to areas in close proximity to these sites. There is a related concern for potential to impact upon wild rice crops through contamination from run-off during application of the herbicide. As described in the FSP

(Section 5.14.3, 5.14.4 and 5.14.5), and earlier in this EIS, studies on the herbicide glyphosate by the manufacturer (Monsanto Canada) and Manitoba Department of Environment (Henderson et. al.1988), indicate that the active ingredient, glyphosate, binds quickly to soil particles and is rapidly biodegraded into natural products. The Manitoba Department of Environment conducted an associated assessment of glyphosate on aquatic environments and the data provided no evidence that glyphosate applications affected the water chemistry of the study ponds and that long term adverse effects to vegetation (*Typha spp.*) were not discernable (Jones et.al. 1996 and 1997).

- Herbicide use and application procedures as outlined in WDS – 014 and the FSP Section 5.15, indicate clear environmental conditions and mitigating procedures to be followed for the application of glyphosate. Monitoring of winds prior to and during application ensures that calm conditions are present to minimize potential for drift from the target area. The desire for dry conditions during and immediately after spraying also minimizes potential for run-off, resulting from precipitation, from the target area.
- Further mitigation is provided by the design of the application area to incorporate use of buffers already in place from the harvesting phase of the operation.
- MC monitors regulation of these activities closely through an approval process that includes not only this FSP, but also requires AORP approvals for each site. Herbicide application also requires application and approval of a Pesticide Use Permit from MC and applicators must be licensed by Manitoba Agriculture. Communication with resource users such as wild rice operators is also an on-going activity of Tembec planning staff in developing plans for specific areas, including the SFMAC. This allows for identification and development of mitigation for sensitive areas.
- The physical properties of glyphosate, spray application and approval procedures provide mitigation for this potential impact.

Forest Protection

Forest Protection activities involving application of chemical pesticides can be viewed in a similar context to the situation involving chemical stand tending.

Insect and disease control, which is the responsibility of MC, may be viewed as having some of the same concerns as those identified with chemical stand tending. As with herbicide application, similar approval requirements are in place to ensure that applicators are licensed by Manitoba Agriculture and a Pesticide Use Permit is obtained prior to application. These procedures will mitigate any potential impacts.

Harvesting of wild rice provides a resource-based economic opportunity for domestic consumption and commercial sale. The wild rice crop is primarily affected by growing season, weather and water levels. Insignificant impacts are related to chemicals used in stand tending and to a lesser extent insect and disease control (a responsibility of MC). Mitigation is accomplished through operational procedures and requirements for application of herbicides

and buffers and leave areas adjacent watercourses. Positive impacts are realized through the increase in access that becomes available for seeding, harvesting and delivery of the wild rice crop provided by forest access roads.

7.5.3.6 Hunting

Two Big Game Hunting Areas and a single Game Bird Hunting Zone have been established by MC within the FML (MC 2009) Big game species available for licensed hunting by resident and non-resident hunters include moose, white tailed deer, bear, wolf and coyote. Game bird species available for licensed hunting by resident and non-resident hunters include migratory birds such as ducks, canada geese, snow geese and sandhill crane and upland game birds such as ruffed grouse, spruce grouse and sharp-tailed grouse.

Hunting licenses are required for all big game and game bird hunting to provide authority to harvest and be in possession of game. In addition, for migratory birds, a Canadian Migratory Bird Hunting Permit and Wildlife Habitat Conservation Stamp is required (MC 2009). In conjunction with sport fishing, hunting activities contribute in a significant way to outfitting and lodge operations throughout FML 01.

Hunting opportunities are generally impacted positively from forest management activities through increased browse from harvest blocks and increased public access through road development.

Planning

Planning activities can have impacts related to hunting in terms of the integration of these values into the planning process to recognize and mitigate facets of forest management that can influence hunting opportunities.

Public Participation has a positive impact for hunting through joint planning, wildlife outfitters, user group discussions, SFMAC and other forums. Information from these activities can be used to assist in location of access and design of harvest areas in the vicinity of identified areas of high potential for wildlife game populations. Discussion with MC and interested stakeholders will take place to identify areas of potential concern and incorporate this information into the overall road planning for the area (WDS – 004 and 009).

Road and watercourse crossing planning can have positive impacts on hunting through the development of road access available for public use. This provides expansion of hunting opportunities to new areas made available through access development. At the same time this can lead to impacts upon the game population without management and regulation of the hunting activity. As described in Section 5.13.5 of the FSP, Tembec will continue to work cooperatively with MC in the implementation of access control to assist in management of the wildlife resources. MC regulates hunting activities to control their impact upon the wildlife populations.

Information collection and application can have a positive impact on hunting opportunity through the identification of areas of importance for hunting activities as brought forward by the SFMAC and other user groups and associations. Such information, in combination with that provided through MC can be utilized in development of the access management plan for the area. In addition information collected through the PHA can assist in evaluation of proposed harvest areas for anticipated habitat conditions following harvest, thereby contributing to the determination of future access management requirements.

Access management can have significant impacts to hunting opportunities through decommissioning activities including use of road closures to limit access to areas identified as potential high value for game species habitat. Application of access management techniques may include controls to limit access thereby limiting hunting activity in the area, however, in the longer term such activities are considered positive to hunting in terms of potential gains in the viability of the game species population in the general area. Such controls can assist in allowing the game species, for example moose, to benefit from the improved habitat conditions in the area provided through harvesting to enable the growth of the population. This will improve hunting opportunities in the longer-term for the overall area.

Infrastructure Development

All-weather and dry-weather road development will increase hunting opportunity through increased access and availability for public use as described above.

Harvesting

Harvesting effects upon hunting are related to the effect that harvesting has on the wildlife habitat conditions for the game species. These impacts, which vary by species, were described earlier in this EIS under "Conservation of Biodiversity – Species Diversity".

Logging impacts for many of these species, such as moose and white-tailed deer, can result in increased browse production producing more favorable habitat for these species. Woodland caribou requiring a more mature forest cover may be impacted as a result of harvesting. For further discussion on impacts to specific species the reader is referred to Table 2 and the associated text regarding terrestrial wildlife species diversity.

- Mitigation is developed through application of VRL techniques maintaining a component of original forest cover followed up with prompt forest renewal of cutblocks including, as noted in FSP management objectives Section 5.2.1.1.1 and 5.2.1.1.2; EMS procedures WDS-003, 004, 005, 006 and 048 and *Guidelines for Riparian Management* (MC 2008):
 - Wildlife corridors, wildlife trees and riparian buffers for protection of wildlife habitat.
 - Understory vegetation retention, particularly adjacent to wetland areas and waterbodies.
 - Maintenance of old forest targets

- Maintenance of large, contiguous core areas
- Maintenance of HIS values for defined wildlife species
- Utilization of natural stand boundaries in development of cutblock design to the extent practical.

Hunting is a popular recreational activity in FML 01 contributing significantly to the outfitting and lodge operations. Generally forest management activities provide positive impacts through the creation of browse from recent cutblocks for moose, deer and some game bird species and increased public access for hunting opportunity through road development. Species such as woodland caribou, requiring mature forest cover, may be impacted by logging. Mitigation includes VRL and prompt forest renewal. Hunting pressure may increase in specific areas impacting on wildlife populations. Tembec works cooperatively with MC through planning of access control in order for MC to fulfill their mandate of controlling wildlife populations.

7.5.3.7 Trapping

Activity in the fur industry varies across much of the forested areas of Manitoba. Furbearer population cycles, changes to habitat conditions, traditional lifestyles of Aboriginal trappers and, most particularly, market demand, affect the harvesting of furbearing animals. Trapping is permitted on unoccupied Crown land and managed by MC through the Registered Trapline (RTL) system (FSP Figure 3.15). Species trapped in the greatest numbers include marten, beaver and muskrat.

Forest management activities impact trapping through disturbance of wildlife habitat, trails and trapping areas by road development and harvest operations. Mitigation is developed through the planning process by incorporating trapline license information into the GIS and updating and supplementing this information with further detailed information during PHA as well as through public participation processes with the SFMAC, trappers associations, RTL line holders (WDS-017) and others.

Planning

Planning activities can have significant impacts on trapping values mainly through location and design of cutblock and road development within trapline areas relative to furbearer species requirements and population fluctuations anticipated from natural disturbance regimes.

Public Participation has a positive impact for trapping through joint planning, user group discussions, SFMAC and other forums. Particularly valuable are individual discussions and joint development of mitigation with active trappers. Information from these activities can be used to assist in location and design of access and cutblocks in the vicinity of identified areas of active trapping activities (WDS 004 and 017).

Road and watercourse crossing planning can have positive impacts on trapping through the development of road access available for trapper use. This provides expansion of trapping opportunities to new areas made available through access development and can assist in distributing trapping pressure across a trapline area. At the same time this can lead to disturbance to the furbearer population due to increased general public access. As described in WDS – 009, Tembec will continue to work cooperatively with MC in the implementation of access control to assist in management of the wildlife resources. MC regulates trapping activities to control their impact upon the wildlife populations.

- Location and design of roads can have very site-specific short-term impacts on trapping trails where the road route intersects the trails. These impacts are mitigable through planning and communication between Tembec and the individual trappers to identify these locations and ensure that trail routes are maintained open when building roads or harvesting (WDS-017). Planned decommissioning is also used to mitigate impacts.

Information collection and application can have a positive impact on trapping opportunity through the identification of areas of importance for trapping activities as brought forward by the SFMAC, trappers association and individual trappers. Such information, including locations of trappers trails and cabins, in combination with that provided through MC can be utilized in the design of roads and development of the access management plan for the area. In addition information collected through the PHA can assist in evaluation of proposed harvest areas for anticipated habitat conditions following harvest, thereby contributing to the determination of harvest design and renewal strategies.

Access management can have significant impacts to trapping opportunities through potential effects upon the viability of trapping in otherwise remote areas while also being a management tool for control of trapping pressure upon furbearer populations in conjunction with application of trapping regulations.

- Access management and public use of roads has potential to impact trapping as a result of the new access created into trapline areas. Some positive benefit to the trapper can be anticipated in some cases allowing for improved access to the overall trapline area. There is also potential, however, for excessive utilization of the wildlife fur resource, should too many trappers begin to make use of an area. Assignment of most areas through the RTL allocation system, in conjunction with regulatory activities of MC provide mitigation for this impact which is insignificant in a landscape context.

Infrastructure Development

Road development, including all classes of roads have potential to impact trapping due to the disturbance to the local furbearer species populations caused by their existence and potential for fragmentation.

All-weather, dry-weather and winter roads may present an insignificant impact in terms of forest fragmentation caused by intersection of wildlife trails and habitats. As described in WDS – 009 and 010 and *Wildlife Guidelines for Forest Management in Manitoba* (MNR

1984), except for approaches to watercourse crossings, road locations generally avoid riparian areas which are generally of particular value to furbearer species. This mitigation at the local level and the temporary duration of roads (with follow-up decommissioning), other than all-weather classes result in insignificant impacts on a landscape scale.

Harvesting

Harvesting activities will have varying effects upon trapping dependent upon the species being trapped and the degree to which a given trapline area is affected. In the short-term the impact of harvesting a given area is significant in that the habitat of the furbearer being trapped has been altered possibly to the point that the species will migrate to adjacent areas. As these harvested areas become reforested and progress through seral stages, the impact can become positive through the continual change in seral stages over the broader landscape.

Logging operations include several measures related to mitigation for trapping values:

- Mitigation, as outlined in WDS – 004 and 017, includes communication with the individual trappers and joint planning processes early in the planning process to gather information such as location of trails, cabins and high value trapping areas. This also offers the opportunity to work out specific mitigation requirements such as design of cutblock layout to retain suitable habitat and trapping opportunity within the general area.
- Other mitigation developed for wildlife management include VRL techniques involving maintenance of understory vegetation, wildlife corridors and particularly the maintenance of riparian areas, which provides important habitat for such furbearers as mink, otter and beaver.

Forest Renewal

Forest renewal activities will have positive impacts to trapping as outline above, by re-establishment of forest cover.

Site preparation/scarification and tree establishment assist in supplementing natural renewal processes to accelerate the return of vegetation cover to harvested sites.

Trapping activity varies, dependent on wildlife populations and market demand. Disturbance and fragmentation of wildlife habitat are the principle ways in which forest management activities impact trapping. Specific impacts include physical blockage of trapping trails, disturbance of trapping areas and increased public access from road and cutblock development. Mitigation is developed through joint planning with individual trappers and communities, VRL, planned decommissioning of roads and prompt forest renewal. Trapping may be impacted positively through increased access for trappers through road development.

7.5.3.8 Aesthetics

The aesthetic or visual quality of the landscape can strongly influence non-timber values of which the viewscape of the surrounding area is an important element. Lodge, outfitting, other tourism operations and recreational pursuits including fishing, snowmobiling and other activities can be affected by the manner in which the views resulting from natural disturbances and those created through forest management activities are perceived. As described by Kimmins (1992), to many people the views associated with the early stages of ecological systems are not as attractive as more intermediate and latter stages. At the same time, as noted by Kimmins (1992), visual appearances should not be confused with ecological function. This has been recognized to a greater extent more recently as more emphasis is placed on operating in concert with ecosystem processes. Bengston ((1994) in, Bidinosti 1998) defines non-timber values as held forest values and assigned forest values. A held forest value is an enduring concept of the good related (harmony) to forests while an assigned forest value is the monetary worth of forest goods and services. In this context it is held forest values that we discuss here.

To a large degree the impact of an activity or natural disturbance on aesthetic value is dependent on the observer and the context in which the landscape is viewed. In assessing impacts and mitigation practices, evaluation will consider the more short-term viewscape values as they may impact upon tourism, recreation and other non-timber values while keeping in mind the longer-term sustainability and functioning of the forest. In this regard the effects of forest management activities upon aesthetic values will also be compared to changes incurred through natural disturbance agents and renewal processes to evaluate the nature and degree of impacts.

Planning

Aesthetic impacts may occur through the visual effects resulting from the implementation of location and designs undertaken in planning roads, watercourse crossings and cutblocks and the resulting increase in public access to operating areas through forest road use. Planning activities for the implementation of forest management operations will generally have a significant impact upon the aesthetic values for the resulting landscapes. The scheduling of operations, location and design relative to natural disturbances and mitigation strategies developed at the planning stage significantly influence the aesthetic outcome.

Aesthetic impacts from natural resource development must be considered in the context of natural disturbance regimes and patterns. As stated earlier, forest fire plays a significant role in the development of natural disturbance patterns in the boreal forest. Fire has historically created widespread and severe disturbance patterns on a cyclic pattern, every 30 to 60 years on the FML, coinciding with extended dry, hot weather events. Fire accounts for an average depletion of 7,500 hectares/year over the past 80 years but averages almost 18,000 to 20,000 hectares/year in severe forest fire decades like the 1920's and 1980's . Forest harvesting occurs at a more consistent rate of 1,000 to 2,000 hectares/year and averages 1,700 hectares/year over the past 17 years (FSP Figure 5.3 and Table 5.1). Insect infestations and disease incidence also shape the natural forest landscape although to a lesser extent. Insect infestations also tend to be

cyclic in nature, especially for species like the forest tent caterpillar which accounted for 100,000 to 500,000 hectares in 2000 and 2001 respectively and then virtually disappeared from the FML (FSP Table 3.7). Spruce budworm infestations have been more consistent and long lived on the FML accounting for 10,000 to 50,000 hectares/year since the mid 1980's but has been decreasing significantly since 2002 (FSP Table 3.7). Impacts from these natural disturbances may also be significant and negative in terms of recreational values and aesthetics in the short-term dependent upon locations impacted relative to those utilized by people. As with impacts resulting from forest management activities they are mitigable over time as a result of renewal and growth of the forest. Unlike natural disturbances however, the location and design of forest management activities can be planned to incorporate viewscape values in conjunction with those important to ecological functioning. Also when considering impacts to aesthetic values, it is important to keep in mind the magnitude, extent, duration and frequency of the activity relative to natural disturbance and resulting impact(s).

Public participation provides a positive impact through joint planning, community involvement, and SFMAC participation to consider identified aesthetic values during the planning process.

- The aesthetic impacts from forest management activities are primarily impacts to the visual quality of the landscape. As described by Paquet and Liboiron (1996), in dealing with landscapes and forest management, an important first step for mitigation is identification of areas of particular interest for maintenance of visual aesthetics. Public participation processes and forums such as joint planning, community meetings and the SFMAC can assist in reducing potential impacts from forest management planning activities through recognition and consideration of locations of interest. Public participation forums are held to inform the public of FSP development and annually for the development of the AORP. Tembec staff holds consultation with other identified resource users and interest groups within FML 01 for planning review and input (WDS – 004). Tembec staff makes themselves available through these forums and as requested in follow-up to discuss and determine methods of mitigating and resolving issues arising from forest management activities.
- In developing the FSP a very concerted effort has and will continue to be put forward to solicit input from local communities and the public regarding the aesthetic values and goals that they consider to be important in setting indicators and targets for management of the forests of FML 01 (FSP Section 2.1, 2.2 and 2.3). This input has been incorporated in the development of the FSP, particularly the plan objectives. The EMS planning and operating procedures and related LLI monitoring and reporting process will be used to guide and measure the success over the FSP period.
- It is the inclusion of public participation throughout the planning process, which provides the opportunity for public input minimizing the potential for impacts from forest management activities.
- Indicator 6.2.1.2 of the LLI tracks issues identified and dealt with regarding non-timber resource values, including those related to aesthetics.

- Indicator 6.3.2.2 of the LLI tracks the inclusion of special use areas and areas of concern into planning processes as they are brought forward during joint planning with First Nations and other public consultation processes.

Road and watercourse crossing planning can impact aesthetics for persons travelling on the roads themselves, and more particularly, for tourists and other recreational water sport users (fishing, canoeing, etc.) and property owners at watercourse crossing locations or viewsapes as seen from lakes.

- Location and classification (all-weather, dry-weather or winter only) of road routes utilize information received from the public and non-timber resource operators in addition to timber access requirements. Where winter roads will meet access requirements while minimizing the visual disturbance to the landscape such development will reduce the duration and magnitude of aesthetic impact.
- Procedures including the minimization of the number of watercourse crossings, locating crossings at narrowest site possible and reduction of road ROW widths at watercourse crossing points (WDS – 003, 006, 009 and 010, WDS-WI- 023 and the FSP Section 5.13) will assist in mitigation of impacts.

Harvest and renewal planning of viewsapes for areas frequented by the public or remote areas associated with lodge and outfitting operations can significantly impact aesthetics. Harvesting adjacent to watercourses impacts tourists and other recreational water sport users and property owners.

- The design of harvest operating areas and cutblocks to accommodate aesthetic concerns can include practices such as the application of variable buffer widths (*Guidelines for Riparian Management*, MC 2008) and the establishment of visual aesthetic buffers, in consultation with MC, for high-use recreational and tourism lakes and rivers.
- The general overall application of designing cutblocks to approximate disturbance patterns arising from natural disturbances assists in mitigating aesthetic concerns at the landscape level. Such practices include the retention of understory vegetation and patches and individual wildlife trees within cutblocks as well as the design of cutblock boundaries to match up with natural stand boundaries where practical (WDS – 010).

Infrastructure Development

All infrastructure development activities, apart from decommissioning, present potential for impact to aesthetic values. The construction and maintenance of roads and camp infrastructure result in temporary to permanent change in the viewscape at a landscape level as seen from the air for travelers to remote lodges and a more local change to scenery for persons on the ground at the site level.

All-weather, dry-weather and winter road development result in impacts on visual aesthetics through a visual fragmentation of the natural viewscape as viewed from the air or at the localized site level.

- All-weather roads result in a more significant impact related to the permanent duration of the impact. Mitigation is achieved through planning to limit development as described by Indicator 1.1.3.3 of the LLI to a road density of less than 0.58 km/km² within a watershed (FSP management objective Section 5.3.1.3.2), and practices to incorporate buffer areas along roads and cutblocks inhibiting visual site lines for identified high-use recreational locations (*Consolidated Buffer Management Guidelines*, MNR 1996).
- Dry-weather roads result in an insignificant impact due to the reduced duration of road use with follow-up decommissioning as per the Road Management Plan for each road (Indicator 5.1.3.2 of the LLI). Decommissioning of these roads includes renewal in conjunction with associated cutblocks which over time will reduce the visual impact of the original placement of the road (WDS – WI – 039).
- Winter roads result in an insignificant impact related to the short duration and frequency of use of these roads in terms of visual appearance on the landscape.

Permanent and temporary watercourse crossings impact visual aesthetics at the crossing site for tourism and recreational watercourse use.

- Mitigation is achieved through the planned decommissioning of temporary crossings and through planning of location and design of permanent crossings at sites deemed navigable under the Navigable Waters Protection Act (WDS-012). At the site and landscape level this impact is insignificant due to the localized extent of impact and the minimization of use of crossings to the extent possible

Camps, timber and fuel storage sites through their use and existence, impact aesthetics through the visual impacts of the site and traffic.

- These impacts are insignificant due to very localized extent and duration and mitigated through planning of the site location and design and through planned decommissioning after use. Access to such sites would generally only occur via the forest industry road infrastructure put in place to access timber resources. Travelers on such routes would be anticipating the location of such sites in conjunction with forest management activities.

Non-hazardous construction waste is generally associated with road and crossing construction locations and camp sites. This material can impact visual aesthetics at a very localized level.

- These impacts are insignificant and mitigated through site inspection and clean-up following construction activities (WDS-013, WDS – WI – 016 and 018).

Decommissioning results in positive impacts to aesthetics through removal of temporary infrastructure including crossing structures, camp and fuel storage sites and dry-weather and winter roads.

- All infrastructure, apart from all-weather roads, are planned for decommissioning which involves temporary infrastructure removal, slope recontouring and revegetation (WDS – WI – 035 to 039).
- Decommissioning of temporary roads is incorporated as part of the planning for each road in development of the Road Management Plan for FML 01 (Indicator 5.1.3.2 of the LLI).

Harvesting

Harvesting impacts aesthetics through the physical removal of trees. This disturbance has similarities and differences with natural disturbances across the landscape. In the context of aesthetic values, both harvesting and natural disturbances result in the change in the viewscape from a mature to overmature forested state to one in which much of the treed canopy has been lost for a period of time.

Logging activities can result in impacts upon visual aesthetics of cutover areas. For given areas at a site level, the impacts upon aesthetics of logging activities are significant in the short term. Harvesting of a given site does result in a disturbance to the original mature forest stand, resulting in a change in the appearance of the site. Impacts from the removal of trees over a cutblock are quite variable, again from the observer's perspective. Consider the impact of a harvested block from a viewscape as seen from a public highway, as compared to a cutblock adjacent a watercourse. In the first case a wider population of people will experience the impact and yet the duration will be minimal. Contrary to this the aesthetic impacts experienced by a canoeist or recreational property owner from a harvested block adjacent a watercourse will be far narrower in public exposure, yet the duration of impact will be considerably greater. Similar perception differences will exist regarding the magnitude and duration of impact from harvest within backcountry areas as compared to harvest adjacent or within site of developed public recreational areas.

- Joint planning and other public participation processes provide mitigation by incorporating identified aesthetic values in preparation of the AORP.
- Harvest block design incorporating VRL involving hardwood residuals, riparian buffers and wildlife corridors are practices (WDS-WI-003 to 006 and 048) utilized, to assist in mitigation through the approximation of natural disturbance patterns.
- Recommended *Guidelines for Riparian Management* (MC 2008) and *Consolidated Buffer Management Guidelines* (MNR 1996) specify leave areas and buffers to be maintained along provincial roads and waterways.

- Prompt forest renewal activities of Tembec will assist in mitigating these impacts by decreasing the time for an area to return to a young forest state. Indicators from the LLI that provide for tracking of renewal activities include:
 - Indicator 2.1.2.1 tracks harvested area successfully reforested and certified as achieving site renewal targets at 7 year regeneration survey.
 - Indicator 2.1.2.2 tracks harvested area successfully reforested and certified as achieving site renewal targets at 14 year free-to grow survey.

As described by Kimmins (1992), some comparisons can be made between the effects of timber harvesting and the visually unattractive impact of agricultural fields following harvest in terms of aesthetic impacts. As further noted by Kimmins, however, the cleared state of agriculture persists for only a relatively short period of time and the effect is soon forgotten in the annual cycle of crop preparation, planting, growth and harvest. Though this effect persists for only a short period each cycle, Kimmins (1992) notes that over the longer-term, the agricultural post-harvest visual impact lasts much longer than in forestry due to the much longer life cycle of the forest once renewal has occurred.

As noted above, the application of VRL techniques in design and implementation of logging activities also provides mitigation opportunities to assist in undertaking harvest operations in a manner that approximates natural disturbance impacts in a visual sense. These procedures, in combination with the prompt renewal of harvested areas provide mitigation to these impacts.

Timber transport to the mill may result in aesthetic impacts from increased truck traffic and related dust in the air.

- These impacts are most prevalent on the forest industry constructed road network where truck traffic can be anticipated by any travelers using the roads. Impacts are further localized in terms of frequency and duration to the points at which the traveling public encounters these vehicles resulting in insignificant impacts.

Forest Renewal

Forest renewal activities present positive impacts through reforestation of harvested areas as described above. Prompt renewal assists in the return of visual values by accelerating the process of restoring the intermediate and older stages of the forest for each site. Chemical stand tending activities can result in visual impacts on a short-term localized basis.

Site preparation and scarification accelerate re-establishment of forest cover through root disturbance and exposure of the soil seed bank on a cutblock. This offers a positive impact to aesthetics in the longer-term by accelerating not only the re-establishment of the planted or seeded tree species but also the natural vegetation sources existing in the cutover prior to harvest.

- In the short-term the visual aesthetics of a site that has undergone site preparation or scarification treatment can be impacted, particularly should treatment not occur until after one or more growing seasons have passed since harvest. Treatment will result in some disturbance to some of the young vegetation that may have become established on the site, as well as to the soils and slash debris in terms of requirements to prepare the site for new tree establishment. These impacts are localized in extent to the specific cutblocks being treated. Duration of the effects in terms of visual aesthetics is short-term with prompt follow-up planting or natural regeneration on the site leading to insignificant impacts. Further mitigation is applied through the application of the type of treatment to match requirements of the site as indicated through PHA and site renewal targets (WDS – 002 and 010 and the FSP Section 5.14.3).
- In the longer-term, site preparation and scarification provide positive benefits in terms of visual aesthetics by assisting in providing conditions suitable to renew each site to meet established reforestation targets. This accelerates the process of “greening up” the site and returning the site to forest covertypes in place prior to harvest.

Tree establishment provides the benefit of assisting natural regeneration processes in promptly renewing cutblocks to meet renewal targets for each site. This process complements natural regeneration taking place on harvested sites in accelerating “green-up” and speeding up the process of recovery to forest stands.

Chemical stand tending may insignificantly impact aesthetics through application of herbicides resulting in short-term disturbance to hardwood trees and other broad-leaved vegetation in the target area. Application of herbicide is only undertaken on selected sites to meet renewal requirements established to return the site to its previous covertype (FSP Section 5.15). Within areas to be treated application design also incorporates the use of buffers and leave areas to mitigate potential impacts to adjacent watercourses and wildlife habitat. These considerations also assist in mitigation of concerns related to aesthetic values at the cutblock level. Limitation of treatment to selected renewal areas; application design and the limitation of frequency and duration of treatment generally to only one time in the forest renewal cycle provide mitigation of visual impacts. Where herbicide treatment is applied, visual aesthetic impacts are generally evident for the season of application only.

Forest Protection

Forest protection measures will generally have positive impacts to aesthetics. As outlined above, natural disturbances can also be perceived as negative impacts to aesthetic values through the resulting loss of intermediate and older forest stands. These natural events are unplanned with respect to timing and location with potential aesthetic impacts in the areas in which they occur where these correspond to locations of human use, particularly for tourism and recreational purposes. Control measures taken to lesson the extent or magnitude of loss from these events provides positive impacts to the continued enjoyment of these values.

Insect and disease control, as described earlier, is primarily the responsibility of MC, however identification of infestation locations to MC as revealed through the PHA process

and timber salvage operations of damaged trees and subsequent renewal activities by Tembec can minimize or mitigate these impacts.

Fire control activities of Tembec, while primarily directed at areas where forest management operations occur, assist MC in over reduction of losses of older forests to fire.

Equipment use

Equipment use can impact aesthetic values through potential site disturbance as a result of heavy equipment operations, noise, dust and exhaust emissions from heavy equipment use and activity in harvest areas, and as a result of fuel storage and waste handling.

In-block operations of heavy equipment can result in aesthetic impacts related to disturbance to sites during operations. Additional aesthetic considerations arise during active logging operations in terms of the noise, dust and emissions from equipment on the site.

- As described earlier with regard to soil and water values, operation of heavy equipment can lead to site impacts through rutting and compaction of soils, which in addition to potential soil and water impacts can also result in impacts to aesthetic visual values for the site. This impact is considered to be insignificant as it relates to aesthetic values given the limited extent of impacts to cutblock areas and related access routes and is mitigated through a variety of measures:
 - Identification of sites with soils susceptible to disturbance during PHA with planned scheduling of operations to appropriate season (winter operations under frozen conditions) (WDS-002 and 010 and WDS – WI – 008).
 - Retention of understory vegetation and application of buffers for areas of high recreation and tourism values (WDS – WI – 006 and *Guidelines for Riparian Management* (MC 2008).
 - Follow-up forest renewal of all harvested sites in fulfillment of renewal commitment will assist in mitigation in the longer-term for harvested cutblocks (FSP Section 5.14.3).
- During active operations, occurring in proximity to high recreational or tourism areas, aesthetic values can be impacted for people viewing these sites in the course of undertaking activities.
 - Public participation processes including joint planning, and meetings with individual operators and associations representing tourism and recreational operators assist in mitigating concerns through identification of areas and seasons of concern. This provides the opportunity to incorporate such concerns into planning of operations including, design to incorporate VRL techniques and buffers (e.g. visual buffers along high use recreational lakes and rivers) and scheduling of operating season.

Fuel storage sites may produce site-specific impacts to aesthetics.

- These impacts are insignificant due to very localized extent and temporary duration and mitigated through the following (WDS – WI – 017 and 019):
 - Planning of sites to be kept away from any watercourses including recreational and tourism areas.
 - VRL buffers to shield high use/value areas.

Non-hazardous and hazardous waste can impact site aesthetics at the local level depending on their handling and disposal and proximity of disposal sites to roads and public view.

- These impacts are insignificant due to their limited localized extent and are mitigated through a variety of measures including:
 - Identified procedures for the handling and disposal of hazardous waste products and follow-up response procedures (WDS – WI – 019 and 020 and the Tembec Emergency Response Plan).
 - Site clean-up with appropriate disposal for all waste products including hazardous and non-hazardous materials (WDS – WI – 018, 019 and 020).
 - The incorporation of aesthetic values through location of sites away from travel routes and use of buffers and sight lines to minimize visibility. Planned decommissioning of these sites following use also contributes to mitigation (WDS-013).

Forest management activities and natural disturbance agents can impact aesthetic values of the boreal forest for people involved in recreational, tourism or viewing pursuits. Impacts perceived by the public are principally visual, but also include noise, dust and equipment and vehicle emissions. The impacts from both forest management activities and natural disturbance are mitigable in time through natural and assisted forest renewal. There are also opportunities to mitigate visual impacts of forest management activities through planning, whereas natural disturbance is a random event. Planning activities have the greatest impact and therefore influence aesthetic values significantly.

Viewscapes become an important value to consider when planning for forest management activities, as it is this value that results in the greatest exposure to the public, whether from a casual occurrence or more intense recreational/backcountry experience. Watercourse crossings present a unique localized site-specific impact. Noise, dust and emissions present impacts from in-block operations and timber transport that are short in duration. Fire control and to a lesser extent insect and disease control impact positively by minimizing the extent of natural disturbance in areas of identified high timber and non-timber value.

Mitigation begins with identification of the areas of interest followed by joint planning and other public participation processes to consider aesthetic values in operations planning.

Activities include modifying practices as per Tembec operating procedures and MC guidelines, VRL, prompt forest renewal and decommissioning of infrastructure.

7.5.3.9 Lodges and Outfitting

A number of lodge and outfitting operations have been established across FML 01, as described in the FSP (Section 3.5). Many of these facilities have been developed primarily to service the sport fishing and hunting sectors.

Dependent upon the type of experience being offered to their clients, lodges are established as road accessible or as remote fly-in operations. Road accessible lodges tend to be more economical to operate as reflected in the prices charged to users. Road access provides ease of movement for supplies as well as for staff and clients. Remote fly-in lodges are developed and operated to provide a different type of vacation experience. A sense of remoteness and wilderness is one of the characteristics featured in the operation of these facilities. To promote this characteristic, operators of these lodges prefer to see minimal access and resource development in the vicinity of their locations. Most of these facilities are based for the most part on sport fishing or hunting participants while also providing accommodation and a base for other outdoor activities.

To a large degree the impacts forest management activities have on lodges and outfitting are related to the impacts and associated mitigation processes of aesthetic values. Lodges and outfitters, particularly those in a remote setting, consider the wilderness setting and associated natural aesthetic values to be an important component of the region in which they operate. Resource development activities, including those associated with forest management can impact upon the values that their clients are looking for and thus their business opportunities.

Planning

Planning activities for roads, harvesting and forest renewal can significantly impact the surrounding region of lodges and outfitting operations thereby effecting their operation.

Public participation and information collection and application can have significant positive influence to the impacts on this component. Public participation enables lodge and outfitter operators and others to participate with Tembec in identifying areas of potential concern through forums that include the SFMAC and planning with interested operators or groups of operators. These forums, in addition to information received through MC and other government agencies, assists in maintaining current information for input into the plan process on which to base mitigation decisions. By each party being aware of the values and interests of other operators in a given area, the opportunity for conflicts to arise is minimized.

Road and harvest and renewal planning result in potential for impact as a result of the development of forest management activities in areas within which lodge and outfitting operators exist. The development of new access into these areas can present concerns due to implications for the wilderness setting of lodges based upon this interest while also potentially improving opportunities for those serving clients arriving by vehicle.

- Public participation to identify issues and provide forums for discussion of options to mitigate concerns is important for incorporating input of the lodge operators at the planning stage.
- Various forms of mitigation are available, as described in WDS – 009 regarding the development of road development and management plans, including consideration of alternative road route locations, road category (i.e. use of winter roads) and timing of road construction activities. Successful mitigation of these concerns depends to a large part upon public communication activities and the participation of the lodge and outfitting operators in joint planning and other forums. As described in the FSP (Section 2.2) and in WDS – 004, Tembec has implemented a variety of public participation forums to assist in this regard. In addition to the public processes directly associated with this FSP, follow-up public meetings are held for each AORP, which provide opportunity for public, and particularly other resource user groups discussion of all road development projects well in advance of any construction starts.
- A dispute resolution process (FSP Section 2.5) provides a structured process to assist in resolving disagreements that may arise through the planning and involvement processes.

Access management and public use of roads has essentially the same related impacts, to those discussed above. Public use of roads provides for access of potential clientele to lodges and other tourist operations dependent upon roads for servicing and client access. At the same time, increased public access into areas once considered remote can limit the impression of wilderness that some clients may have of areas utilized by more remote lodge and outfitting operators. In addition to the mitigation steps described above for planned development of the roads, access management options, developed jointly with MC and in discussion with the remote operators, can be considered in some situations as described in WDS – 009.

Infrastructure Development

Road infrastructure development will vary in its impact upon lodge and outfitting operations dependent upon the type of operation concerned and the class of road and associated service life. For remote fly-in type operations the lack of road access and general feeling of remoteness is a key component of their attractiveness to their client base. In other circumstances roads can impact positively by creating new access and opportunity to establish new operations or to decrease costs of servicing existing operations dependent upon road access for their clientele.

All-weather roads present a non-mitigable impact to some degree for remote operators where locations are not routed to avoid their vicinity. This situation can result in a site-specific impact for such cases where the inconsistent interests of the forest industry and the lodge and outfitting industry arise on the same landbase. It is expected that in general, routing of roads and options for road classification can avoid these situations. For operators who rely upon road infrastructure for access by their clientele and for supplies, all-weather roads provide the positive benefit of reliable year-round access and outfitting opportunities.

Dry-weather roads can result in a significant though mitigable impact for remote operators with temporary duration and decommissioning providing mitigation.

Decommissioning of roads as planned for in the Road Management Plan assists in the mitigation of road development. Up-front public participation to include lodge and outfitting operators provides opportunity for participation in the road management plan for roads in their vicinity including decommissioning (WDS - 009).

Harvesting

Harvesting activities can result in impacts upon lodges and outfitting operations related to the visual aesthetic impacts of cutover areas. These impacts and mitigation processes have been described in detail earlier. Specific to effects upon lodge and outfitting operators the following points are highlighted:

- VRL practices to incorporate leave areas, line of sight guidelines, utilize natural stand boundaries and retention of wildlife trees and understory vegetation (WDS – WI – 003, 004, 005, 00 and 048) will assist in mitigation by maintaining “greener” visual appearances from the air, and buffering high value tourism lakes and rivers to minimize sighting of cutover areas from the water by clients. These practices, as noted earlier assist in efforts to approximate natural disturbance regimes at a landscape level.
- Prompt forest renewal activities of Tembec will assist in mitigating these impacts by decreasing the time taken to return the site to a young forest stand and promoting “green-up” of cutovers.
- Developing mitigation to be applied on operations involves interaction with affected stakeholders including lodge/outfitters and other tourist operators in the affected areas at the planning stage. The SFMAC and on-going consultation with resource users provides opportunity for this action. As with any situation where two or more resource users are utilizing the same landbase to carry on their activities, it is important that they each respect the others interests and communicate to jointly develop mitigation.

Forest Renewal

Forest renewal activities have a positive impact upon the lodge/outfitting sector in that prompt forest renewal activities, as implemented by Tembec (FSP Section 5.14.3), will speed the transition of harvested sites to later seral stages having preferred aesthetic qualities for potential clients. As this transition occurs, the aesthetic appearance values of the new stands will generally be very similar to those of natural fire origin stands. Some positive benefits can also be anticipated in these newly regenerating areas in terms of hunting for species such as moose, white-tailed deer and upland game birds as a result of improved food supplies for these species.

Forest Protection

Forest protection activities have positive benefits on the operations of lodges and outfitters. Fire and to a lesser extent insect and disease has the potential for significant impacts to their operations considering the magnitude and extent of disturbance and duration of effects in the area of their operations. Forest protection activities, including insect and disease control and fire control will have positive benefits to lodges/outfitting operations in terms of maintaining visual aesthetics of the mature forests.

Fire control can have the obvious benefit of protecting the asset values of buildings and other values in situations of forest fire incidence in the immediate vicinity of the lodge or outfitting camp sites in addition to the maintenance of visual aesthetic values for the surrounding area.

- Harvesting operations of overmature timber can assist in reducing potential for fire, insect and disease incidence to some extent by cycling a portion of older stands with higher fuel loading and susceptibility to insect and disease infestation to younger stands.

Insect and disease control is the responsibility of MC, however, salvage harvesting activities of insect/disease damaged timber can assist in limiting spread of infection and reduce the chance of large scale catastrophic fires by reducing fuel load.

Equipment Use

Equipment use on in-block operations can result in impacts to lodge and outfitting operations primarily from noise resulting from operations in close proximity to locations where clients are taken.

In-block operations of heavy harvesting and renewal equipment can result in a localized noise disturbance for people in the vicinity during operations. This impact is insignificant in terms of the limited extent of effects and the duration over which activities take place.

- To assist in mitigation of disturbance due to noise at operating sites, communication between Tembec and the lodge/outfitting operator is important to identify their respective plans and coordinate their activities to the extent possible. Harvest operations may be scheduled to avoid the principal season of operation for the lodge/outfitter dependent upon the logging conditions of the cutblock or distance from lake, lodge or outfitting site modifiers may be applied to the forest management operations to reduce the potential for noise to travel to the specified site. Likewise, the lodge/outfitting operator may be able to avoid transporting guests in the vicinity of the site-specific cutblock area while operations are in progress.

Lodges and outfitters have developed primarily to service the sport fishing, hunting and more recently the ecotourism sectors. Many of the impacts on lodges and outfitters are related strongly to those of aesthetic values. Certain of the lodge operators and outfitters desire to maintain a wilderness experience for their clients and therefore wish to limit road development in proximity to their operations. Hunting opportunity as discussed earlier can benefit from

road and cutblock development in terms of the increased access and improved wildlife browse. Fire as a natural disturbance agent can present significant unplanned impacts to lodges and outfitters and fire control can provide a positive impact including protection of property values.

Mitigation, as with aesthetic values, focuses on planning activities through public participation with individual lodge and outfitter operators and the SFMAC and an understanding of stakeholder needs. VRL, prompt forest renewal and site decommissioning also assist in mitigation on the ground.

7.5.3.10 Snowmobiling

A number of snowmobile clubs have been formed in the FML. In addition to these organized clubs, numerous individuals have taken up this activity throughout the area. A number of designated and undesignated routes are in place throughout FML 01, including within Nopiming Provincial Park (FSP Figure 3.17). Riders also undertake touring throughout other areas in addition to the regularly opened and maintained trail networks.

Impacts to snowmobiling are primarily from intersections with trails and resource roads and the resumption of forest management activities on resource roads which are being utilized as snowmobile trails. Positive impacts result from the increase in trail network provided by Class III and IV roads.

Planning

Planning activities, as they relate to the identification of snowmobile trail networks and incorporation of this knowledge into implementation of operations, have potential for impact upon snowmobiling.

Public participation processes of Tembec provide opportunity for snowmobile clubs and interested individuals to become aware of planned operations in their areas of interest and to bring forward any concerns to the Company.

Road and harvest planning can give rise to impacts to snowmobiling relating to the development of access routes and location and design of harvest cutblocks in the vicinity of identified trail networks.

- Through continuing communication with resource users such as the snowmobile clubs (WDS - 004), Tembec can be advised of identified high use trails for consideration in planning of road networks. Intersection points of trail routes with planned roads and operations in cutblocks can be considered in light of visibility at these crossings for safety of riders and users of the road. These impacts are considered to be insignificant and mitigable.
- Communication with snowmobile clubs, in advance of resuming use of resource roads, is required where agreements have been established between Tembec and the snowmobile

club for use of the road during inactive periods of resource use. Discussions at the planning stage allows for the establishment of alternate snowmobile routes or temporary closure of the snowmobile trail while the resource road is in use.

Information collection and application in terms of the identification of trails to Tembec for consideration in the planning process and implementation during operations is important to allow these steps to occur.

- As with any situation where two or more resource users are utilizing the same landbase to carry on their activities, it is important that they each respect the others interests and communicate to jointly develop mitigation.
- PHA of cutblocks provides opportunity to identify established trails where advance information has been made available through snowmobile clubs and MC. This verification can assist at the planning stage to provide notice for operators in implementation of the plan.

Access management activities can have positive benefits for snowmobiling in terms of the opportunity for use of road routes no longer in use for forestry operations for snowmobiling.

- Access to such routes can be beneficial in expanding snowmobile access to new areas. Class II, III and IV roads no longer in use may offer opportunity for expansion of trail networks in such cases through continued dialogue with snowmobile clubs and MC.

Infrastructure Development

The development of road infrastructure has potential to impact trail systems at points of intersection through trail disruption and potential for blockage by debris.

- These impacts are insignificant and mitigable through communication and joint planning with the users, identification of trail systems in the vicinity of the proposed road routes and cutblocks and maintaining clear access after operations are complete.
- Dry-weather and winter roads offer a potential positive impact through an increase in the trail network following decommissioning of the routes for forestry use.

Harvesting

Harvesting activities, similar to the construction of roads, have potential for impact upon established trails as a result of blockage caused by logging debris. This can create disruption to the existing trail network through the area.

- As described above, mitigation involves communication with the snowmobile club organizers and MC to identify potential situations where planned cutblocks may intersect identified trails and ensure the trails are kept clear following operations. These impacts are insignificant and mitigable.

Snowmobiling is a popular winter sport within FML 01. Impacts to this component primarily arise due to potential for blockage of trails with debris at intersection points with roads or cutblocks. Exchange of information between snowmobile clubs, MC and Tembec provides opportunity for identification of established trails during PHA at the planning stage with follow-up direction for operations to maintain trails are clear for passage after operations are complete. Access management activities that result in the decommissioning of dry-weather and winter roads following use can provide opportunity for expansion of trail networks into new areas providing positive benefits.

7.5.3.11 Skiing

In a similar fashion to snowmobiling, cross-country skiing is taken up as an outdoor recreation activity by a number of people throughout FML 01. Many people ski through open country without relying upon groomed trails. Designated ski trails are available in Poweerievie/Pine Falls, Pinawa and Lac Du Bonnet.

As is the case for snowmobiling, potential for impacts to cross-country skiing is related to the potential blockage of established trails. Positive benefits may also occur in situations where decommissioned or roads temporarily out of use provide opportunity for expanded trails.

Planning

Public participation, information collection and access management can have positive impacts on skiing through opportunities to identify areas of concern, established trail locations in the vicinity of planned operations and potential for expanding trail networks utilizing decommissioned roads as described earlier for snowmobiling. Public use of Tembec roads provides the benefit of improved access for skiers who may wish to travel to new areas for backcountry skiing.

Road and harvest planning has potential for insignificant impacts to skiing activities. Similar to snowmobiling, established trails could be impacted through blockage by debris in the course of road construction or harvesting activities. Mitigation occurs through on-going communication at public meetings and through the SFMAC to provide input to Tembec regarding established trails.

Potential impacts are considered to be insignificant as road routes and harvesting operations are not planned in the vicinity of groomed cross-country ski trails. For backcountry skiing, activities public participation providing input to planning design will help to mitigate potential concerns.

7.5.3.12 Canoeing and Designated Waterways

In the open water months, canoeing (including kayaking) is a popular activity on the waterways of FML 01. There are a number of provincially recognized canoe routes described in the FSP (Fig 3.17). Of these routes, the Sasaginnigak Canoe Route includes the Bloodvein

River, which is recognized as a National Heritage River. The majority of the canoe routes are located in Nopiming Provincial Park or originate in the Park and traverse the FML to PTH 304 or Lake Winnipeg. The FML is also an entry point for canoe routes in Atikaki Provincial Park and Woodland Caribou Provincial Park in Ontario (FSP Section 5.9.1.3). Recreational canoeing is also undertaken on many other lakes and rivers beyond those provincially recognized routes listed in the FSP.

Impacts on canoeing and designated waterways are related to those described earlier for aesthetics in that the viewscape associated with travel on the waterways can be impacted through harvesting. Watercourse crossings present site-specific concerns to waterway users. Impacts must be considered in context with natural disturbance agents, particularly fire.

Planning

Planning activities have potential to impact canoeing and similar activities on watercourses in FML 01 in terms of the location and design of crossings associated with road development and cutblocks and roads as they relate to scenic values along watercourses.

Public participation involving consultation with the SFMAC and input from individuals and user groups during the planning process provides a positive benefit in providing opportunity for communication of planned operations (road routes, crossing sites and harvest areas) and discussion of identified concerns to incorporate these values in development of mitigation.

Road and watercourse crossing planning can have significant impact on canoeing and waterways. Much of the appeal of canoeing is related to the wilderness setting and associated viewscales. Any roads or crossings within site of canoe routes and associated traffic can impact upon this value.

- Roads are generally located well away from watercourses and outside of established riparian buffers, however crossings necessarily impact the watercourse at the site level.
- Indicator 5.1.3.2 requires the completion of a road management plan for the existing and proposed road network, which considers values related to recreational and tourism development and use.
- Mitigation can be accomplished through road route planning, which takes these values into consideration as described in WDS – 004 and 009. Road routes generally avoid waterways to the extent possible, with minimal crossings only when necessary. These factors in combination with construction practices that consider aesthetic concerns in high use recreational areas will mitigate these impacts.

Harvest planning can similarly impact values associated with canoeing, though to a lesser extent than roads given general use of buffers along high use recreational watercourses and the application of renewal practices resulting in temporary effects.

- Incorporating information available from MC and PHA investigation, location and design of cutblocks utilizes buffers of varying widths that provides mitigation for scenic values along watercourses.
- At the landscape level, the design of cutblocks to approximate natural disturbance patterns through use of natural stand boundaries as cutblock boundaries, and retention of understory vegetation and wildlife trees in patches and as individuals will further mitigate concerns related to scenic values. This will assist in maintaining values for locations from which landscape views can be seen such as during air travel to reach watercourse destinations.

Information collection and application can assist in a positive way to the development of mitigation at the planning level. Information obtained from MC for input to the FSP regarding provincial canoe routes is supplemented by on-going input received through joint planning, community meetings and other public forums as well as site specific information from PHA (WDS – 002).

- Mitigation development is assisted through input and updating of provincial tourism and recreational waterway routes in the Tembec GIS database for consideration in road, watercourse crossing and harvest cutblock location and design.
- Joint planning and other public participation forums provide opportunity for recognition of aesthetic scenic and related values of users of the waterways in FML 01 in planning road development and harvest design in the vicinity of identified waterways.
- PHA and in particular, pre-crossing assessment for watercourse crossing sites (WCA), provides additional information for application to design of operations, particularly watercourse crossings. As part of the pre-crossing assessment for all planned crossings known use of the watercourse involved by canoeists and other travelers is identified for incorporation in crossing location and design (WDS – 003).

Access management and public use of roads can impact both negatively and positively on canoeing and waterways. Public use of roads located in close proximity to designated waterways can result in increased traffic impacting the values of wilderness and solitude along the waterway in that vicinity. At the same time road development can provide improved access to the waterways providing entry points for people wishing to make use of them. Given the infrequent level of traffic along these roads these impacts are considered to be insignificant.

- For roads and associated crossings mitigation is achieved through access management activities including road design to limit seasonal use, access restrictions and route decommissioning of temporary roads and crossings.
- Indicator 5.1.3.2 of the LLI framework tracks the development and implementation of a road management plan for FML 01.

Infrastructure Development

Infrastructure development in the vicinity of watercourses can impact upon aesthetic scenic values where infrastructure is within site of the watercourse itself.

All-weather and dry-weather road construction in proximity to designated waterways and other waterways used by canoeists can result in impacts as a result of changes to aesthetic values should the road route be located close to the waterway itself. These impacts are expected to be insignificant in a landscape context.

- Location and design of roads adjacent to riparian areas will utilize criteria as described in the *Wildlife Guidelines for Forest Management in Manitoba* (MNR 1984), *Timber Harvesting Practices for Forestry Operations in Manitoba* (MNR 1994) and *Forestry Road Management* (MC 2005B) including design of routes to avoid placement of roads within 100 m of the high-water mark of any permanent waterbody. These procedures will assist in mitigation of potential aesthetic impacts from construction of roads.
- Duration of use and associated potential impacts of dry-weather roads are temporary, with decommissioning planned up-front as part of the road management plan for each road (WDS – 009).

Permanent watercourse crossings construction is the principle way in which designated waterways and other watercraft use routes can be impacted by forest management activities.

- All such waterways fall within the approval requirements of the Federal Navigable Waters Protection Act. This requires that Tembec submit an application through the Canadian Coast Guard including the design of the each crossing. Planning and construction procedures for crossings are described in WDS – 012 and WDS – WI – 026.
- To the extent that the wilderness and sense of solitude along the waterway is affected at the point of crossing, the impact of these crossings is non-mitigable. These impacts, however, are limited in extent to the immediate vicinity of the crossing itself. In terms of travel and use of the river, the design requirements of the Navigable Waters Protection Act and those related to MC stream crossing guidelines (DFO/MNR 1995) and the address mitigation for these crossings.

Temporary watercourse crossings, due to their short-term, often seasonal use, are expected to have insignificant impacts on designated waterways and canoeing related to the shortened duration of potential impact at any given crossing site.

- Design requirements and construction standards in terms of placement of temporary crossings are as per the Navigable Waters Protection Act, for locations falling under the Act, with applicable mitigation as described above (WDS – 012, WDS – WI – 026).

- Decommissioning activities, as described in WDS – WI – 035 to 039, assist in mitigation of aesthetic scenic values for temporary crossing locations through removal of infrastructure and restoration of riverbanks following the period of use. Such decommissioning activities are described in the Road Management Plan for each road in association with the planning process (WDS – 009.)

Non-hazardous construction waste principally from construction of watercourse crossings may present an insignificant impact to scenic values in the vicinity of crossing locations.

- WDS – WI - 018 specifies requirements to maintain crossing sites and road corridors free of construction material debris after construction or decommissioning, mitigating this potential impact.

Decommissioning activities provide for positive benefits through the removal of watercourse crossing infrastructures and termination of use of road routes. These activities can provide mitigation of the impacts of the road on the aesthetic scenic values from the waterway as the road ROW becomes re-vegetated and crossing infrastructure is removed. Decommissioning of crossing sites, in particular, assist in returning the visual characteristics of these locations to a more natural state. Vehicle traffic at these locations no longer has a visual impact once decommissioning is completed.

Harvesting

As is the case for roads and watercourse crossings, harvesting impacts upon canoeing and other watercraft uses along waterways in FML 01 is related primarily to the potential change to visual aesthetics along these waterways resulting from harvesting.

Logging activities along canoe routes and designated waterways as with other watercourses, are managed through the prescription of riparian management zones of variable widths dependent upon the values to be addressed. Tourism and recreational aesthetic values of these waterways contribute to the decision of the degree of retention for aesthetic purposes. Logging may significantly impact the intrinsic value of the wilderness for the recreational water user. A unique quality of the recreational water user is the view distance from waterbodies. The viewing distance can be significant, depending on shoreline slopes, and this presents additional constraints for planning operating blocks and not all concerns can be addressed. These impacts must be considered in context with natural disturbance agents, particularly fire, where entire shorelines may be subject to a burn and subsequently impacted.

- Mitigation is achieved through riparian buffers, VRL practices and prompt forest renewal of the cutblocks including:
- Variable buffers and corridors for riparian protection to meet identified tourism and recreational values (MC 2008).
- Understory vegetation retention, particularly adjacent to wetland areas and waterbodies (WDS-004, 005, 006 and 048).

- The establishment of viewscape buffers, in consultation with MC, through on-site viewing from the potential points of impact.
- Design of cutblocks to approximate natural disturbance patterns including utilization of natural stand boundaries in development of cutblock design to the extent practical and application of varying cutblock sizes and shapes will assist at the landscape level for views extending beyond the immediate shoreline (WDS – 010).
- Englin *et al* (1996) in a study relating to the impacts of forest fires on backcountry forest recreation in Nopiming Park, made several observations relating to the impacts of harvesting activities in this area, a high use recreational area within FML 01. In the course of conducting field work for their study the authors found that few canoeists, if any, leave the waterway to hike in the forest. Englin *et al* (1996) go on to indicate that little if any evidence of forestry activity was observed from the canoe routes. This would suggest that in the case of canoeing and other uses of waterways for tourism and recreation, which was the focus of this study, the application of buffers along such high tourism and recreational value waterways in conjunction with prompt forest renewal are effective measures to mitigate visual aesthetic concerns. In a related study to assess backcountry recreationists' wilderness park values, also based in Nopiming Park, Boxall *et al* (1996) indicated that the majority of participants surveyed had not observed any physical indication of logging activities. The authors further suggest that logging activities had not influenced the selection and use of canoe routes by study participants. Some potential benefit of the presence of cutblocks along these routes was suggested as related to the improvement in habitat for some wildlife species that is caused through logging. This is observed as a potential positive influence upon wildlife viewing along such routes (Boxall *et al* 1996).

Forest Renewal

Forest renewal activities, as indicated earlier, provide positive benefits to visual aesthetics and thereby canoeing and other waterway use activities by accelerating the process of returning harvested sites to a forested state.

- The FSP (Section 5.14.3) outline procedures for prompt forest renewal of forest stands to similar composition to those harvested assisting in mitigating impacts on scenic values.
- Indicators 2.1.1.1 and 2.1.2.2 track harvested areas successfully reforested and certified as achieving site renewal targets at 7 year regeneration and 14 year FTG surveys respectively.

Equipment Use

Use of equipment in undertaking forest management activities can impact upon wilderness values associated with canoeing and other forms of waterway travel as a result of the noise from operating equipment.

In-block operations may impact canoeing and waterways through the noise produced by heavy equipment during operations. The limited extent of such impacts in close proximity to active operations and the short duration of this activity for a given cutblock and stretch of given waterway results in insignificant impacts.

- Mitigation measures can include application of variable width buffers along waterways dependent upon values acting primarily for riparian protection and aesthetic values but also acting as a barrier to sound.
- High-use tourism and recreational locations, identified in consultation with MC, may have conditions applied to forest managements operations in relation to season of operation, days of the week and/or time of day.

In addition to provincially recognized canoe routes, recreational canoeing and kayaking is undertaken on many lakes and rivers within FML 01. As much of the experience from canoeing is related to the wilderness setting, impacts on this component are related to those of aesthetics in that the viewscape may be impacted through cutblock harvest and road development. Permanent watercourse crossings present significant impacts. Although road development may negatively impact this component, roads also provide additional public access for these opportunities throughout FML 01. Mitigation is achieved by identification of areas of concern through public participation with users and discussions with MC, application of modifying practices as per Tembec Ems procedures, Federal Navigable Waters Protection Act requirements and MC guidelines, prompt forest renewal and decommissioning of infrastructure.

7.5.3.13 Tourism

The forests, rivers, lakes and resident wildlife of FML 01 provide the basis for an active tourism industry based primarily on the outdoor opportunities presented by these resources.

Many of the impacts to tourism are related to those of visual aesthetics. In addition, however, it is noted that tourism values can cover a range from desire for accessible hotel/lodge accommodation to ecotourism wilderness settings. Desired activities related to tourism include a number of non-timber values discussed separately in this section including sport fishing and hunting, snowmobiling, skiing and canoeing. Impacts upon lodges and outfitting services have also been described. In this section, impacts will be described in terms of potential to effect the tourism industry more as a whole than in terms of individual activities that tourists may take part in. Again, tourism values greatly depend on the duration, frequency and extent of disturbance. Fire and insect infestation are unpredictable and can significantly impact tourism values enjoyed by the public. In a recreation (primarily canoeists) study in Nopiming Provincial Park, Boxall *et. al* (1996) suggests that recreation site choice is partly influenced by fire incidence since stand age is strongly correlated with site choice. The general application of watercourse buffers for high value recreational and tourism area watercourses at the planning stage differentiates harvesting from wildfire in maintaining this component. Forest management activity impacts are considered in context with natural disturbance patterns.

Planning

Planning activities for consideration of tourism values, as with many non-timber values, depend to a great extent upon identification of areas of mutual interest and understanding of each party's interests and constraints. In the case of tourism values, planning activities and various options under consideration may impact positively or negatively on tourism values, dependent upon the sector of the industry being considered.

Public participation processes can have a positive benefit upon tourism values through enabling the various party's to come together to identify areas of mutual agreement and differences and discuss available options.

- The SFMAC is noted to be particularly suited for discussions related to tourism values with representation of various tourism, as well as other forest interest sectors. This forum provides a cross-section of representation from across FML 01.
- In terms of identifying interests and potential mitigation for specific tourism operations, discussions with individual operators through joint planning, associations and community meetings, with individual follow-up as required, is best suited to develop specific mitigation as described earlier for individual types of activities.

Road and watercourse crossing planning can impact tourism through road development to previously difficult to access areas. Impacts of this access and the type of access that occurs depends upon the values for accessibility or wilderness desired by the various tourism operations present in the area.

- Positive benefits and potential negative impacts are balanced and mitigation developed through the SFMAC, joint planning and community meetings, user groups and individual discussions.
- Results of these discussions and the requirements of Tembec to operate sustainably across the landscape are reflected in the preparation of the Road Management Plan prepared, for new operating areas, in preparation of the AORP (WDS – 009).

Harvest and renewal planning may impact tourism through operating block and associated cutblock development in areas of high recreational value related to potential significant impacts to visual aesthetics.

- These impacts have been described along with mitigation practices in discussion of aesthetics earlier in this EIS. In brief, landscape level planning efforts to operate similar to natural disturbances and site level practices to implement VRL and prompt forest renewal are incorporated in undertaking operations.
- As referenced earlier, Englin *et al* (1996) noted in their study related to visual impacts of forest fire on backcountry forest recreation in Nopiming Park, that cutblocks are generally

smaller in area and in fact have much less impact on the landscape from a visual aesthetic standpoint.

Information collection and application can positively benefit tourism through consideration of these values in planning for operations, particularly in developing the road management plan for each road. Identification of these values is an important first step to enable the party's involved to identify potential concerns and address these through the planning process.

- Sources of information include government data regarding land use as brought forward through MC and the IRMTs in particular, and more site-specific information through joint planning and community meetings. PHA assists through provision of field information and provides for incorporation of this data into mitigation practices to be developed in the preparation of the AORP.

Access management and public participation can have impacts on tourism values as it relates to the control of access to areas of FML 01 developed for forest management activities. Up-front consideration of these values at the planning stage as reflected in development of the access management plan for each access route is important to mitigate interests promoting remote access while also recognizing those opportunities where increased access to an area can be beneficial (WDS – 009).

- Public use of new roads can have a positive impact on tourism through provision of expanded opportunities for access by tourists across FML 01. Increased access may offer opportunity for tourism development that in turn attracts more tourists to the area.
- Based upon consideration of overall values, including ecotourism activities such as remote lodge operations, access management, including control and decommissioning of access, can positively benefit these values.

Infrastructure Development

The potential impacts upon tourism in terms of infrastructure development are generally most closely related to the location, design and access management applied to each new route at the planning stage as described earlier. Decommissioning activities play a role as part of the overall application of the access management plan for each route.

Decommissioning can provide positive impacts to tourism through removal of infrastructure for situations where review of interests in the area indicates potential benefits from this action. Decommissioning of infrastructure including roads, landings, timber storage sites, watercourse crossings, pits, quarries, and camp sites reduces the extent of visible development in areas of operations resulting in positive benefits for aesthetic values.

- Decommissioning involves infrastructure removal and returning of sites to a pre-development state by slope re-contouring, debris re-spread and revegetation (WDS – WI – 035 to 039).

- For dry-weather roads decommissioning activities are undertaken in light of the overall values and opportunities represented by the existence of the road as determined in developing the road management plan for the road at the planning stage (WDS – 009).

Harvesting

As described earlier, harvesting activities can impact upon tourism values in terms of effects upon visual aesthetic values.

Logging activities can have significant impact upon tourism values related to visual aesthetics at the site level. As described for aesthetics, these impacts are generally specific to individual sites as viewed during travel through operating areas within FML 01. There may also be some effect for tourism involving air travel at the landscape level for activities such as remote lodge use.

- Mitigation activities start with open communication between Tembec, MC and tourism operators achieved through public meetings, SFMAC and discussions with individual tourist operators. The cutblock design criteria described earlier for VRL including use of variable block size, retention of residual understory vegetation and wildlife trees and use of buffers and corridors will assist in site specific mitigation, (WDS – WI – 004 to 007 and 048). Tourist operators can assist in mitigation by avoiding areas of active operations in transportation and location of their clients. Through application of these steps and in consideration of the factors of time (greening up and renewal of harvested areas) and the expanse of the forested area of FML 01, these impacts are mitigable.

Forest Renewal

Prompt forest renewal provides good evidence to tourists of the sustainable forest management intentions of the Company providing a positive impact upon tourism values (FSP Section 5.14.3). Once renewed, these areas will tend to blend into the overall landscape as a result of the various mitigating practices implemented at the harvesting stage. The result, in most cases can be expected to be very similar in appearance to that achieved through natural fire disturbance.

Forest Protection

Forest protection through fire, insect and disease control, primarily the responsibility of MC, with cooperation from Tembec, can provide positive benefits to the tourism industry through maintenance of visual aesthetics of the forested landscape. Protection of physical infrastructure values belonging to tourism operators is also a function of MC within the overall fire protection program.

Equipment Use

Equipment use on active operating sites will impact tourism values related to equipment noise, dust and the visual appearance of active operations.

In-block operations of heavy equipment causes potential impacts from equipment noise and dust and visual appearance. These are very site-specific impacts limited in extent to the areas currently in active use. At any given location, duration is likewise limited resulting in impacts which are insignificant.

- Mitigation is accomplished through open discussion and public participation for all parties to be aware of the operations and activities of other users. Where flexibility exists, this enables the use of scheduling by both the tourist operator and Tembec to assist in resolving concerns. As discussed previously in the EIS, distance modifiers for active operations may be employed to mitigate the potential for noise impacts on lodge locations, lakes and outfitting sites. VRL techniques are also employed using buffers, corridors and leave areas, which will assist in dampening noise levels.

Tourism is an active industry within FML 01. Many of the impacts related to tourism are related to those of described for aesthetic values. Impacts include road and cutblock development and equipment noise and dust during harvesting and hauling. Joint planning with the SFMAC and tourist operators, VRL practices, distance modifiers for operations, prompt forest renewal and decommissioning are used to develop mitigation. Positive impacts include public use of new road systems, site decommissioning and forest fire control.

7.5.3.14 Special Forest Products

Special forest products are non-timber products including country foods, medicinal and decorative products including extracts collected from the forest and used either locally or marketed commercially. There are currently no commercial non-timber forest product (NTFP) enterprises operating on the FML; however, The Manitoba Model Forest, in the first phase of the Forest Communities Program, has been promoting the development of NTFP through workshops in the local communities. Medicinal plants are collected by individuals in the local First Nation and Northern Affairs communities but these activities are generally kept secret by those involved.

In general, the most economically important product NTFP is seneca root. Manitoba is a principal producer of this medicinal plant. Other products may include, mushrooms, and wild berries as food products and sweet flag, bark of high bush cranberry bark and willow and wild sarsaparilla, water lily and old man's beard (arboreal lichen) as medicinal products.

Planning

Planning activities can have significant impacts on non-timber forest products through spatial location and design and temporal scheduling of forest operations. Many of these plants inhabit forests at specific seral stages with narrow requirements for temperature, moisture, light and vegetation associations. Forest operations planning therefore can have great influence on habitat availability of for development of these products.

Public participation leads to positive benefits for use of non-timber forest products in providing forums for identification of specific sites of interest and allowing for incorporation of these interests in harvest planning.

- Information obtained through joint planning and other forums provides opportunity for the consideration of harvesting of non-timber forest products in developing timber harvest plans.
- Any sites identified as containing non-timber forest products of interest for harvest and scheduled for timber harvest can be identified during joint planning with communities allowing for harvest of the products prior to timber harvesting.
- Through the use of the GIS, joint planning with NTFP users can identify potential sites where specific NTFP may be located which are currently not known to the users.

Harvest planning of cutblocks can have a significant impact on availability of special forest products as a result of scheduling of such areas for timber harvest. As described above, these products generally rely upon forest conditions related to the seral stage of the forest as well as soil and moisture conditions for growth. As such, the conditions for growth of these non-timber forest product species will change over time in any given stand as a result of changes due to forest stand succession, natural disturbances or timber harvesting. At the same time, it should be noted that as one area is removed from production for these products as a result of any one of these mechanisms, another may be approaching as suitable habitat for a particular non-timber forest product species through forest succession. Across the landscape, natural disturbance plays a significant role and impacts greatly on available, suitable habitat for these species.

- Mitigation is achieved through communication with local communities and residents, who harvest these products, in involvement processes (WDS-004) to gain an understanding of the locations and relative levels of use of these products and to incorporate these interests into planning for timber harvest and renewal activities.

Information collection and application can have positive benefits for non-timber forest products harvesting as it this process which enables Tembec to become more aware of the uses of these products and potential conditions where they are expected to be found. This information in turn can assist in developing mitigation to incorporate these interests into planning processes.

- Joint planning processes are viewed as the best starting point for input of interests in non-timber forest products and their potential growing conditions and locations. Through the use of the GIS, joint planning with NTFP users can identify potential sites where specific NTFP may be located which are currently not known to the users.

Access management and public use of roads can have an impact in terms of the capacity to make use of non-timber forest products across the landscape.

- Access management planning including the availability of roads for public use provides increased access to new sites for harvesting of non-timber forest products providing a benefit for the people who wish to harvest these resources.

Harvesting

As described earlier, harvesting may significantly impact non-timber forest products on an individual site basis through harvesting of sites supporting these products. As stated above, each of the products require specific habitat requirements and as forests continue through forest succession, habitat conditions change precluding some species while providing opportunity for others.

Logging operations, similar to natural catastrophic events, such as fire, may significantly impact these products altering the habitat for a period of time at the site level. While harvest or natural disturbance of one area may alter habitat to preclude specific plant species, other forested areas as they develop, are providing new habitat for those same species.

- Mitigation is achieved by planning of operating blocks that creates a mosaic of successional forest types providing a continued opportunity for suitable habitat for these non-timber forest products across the landscape.

Forest Renewal

In a general sense, forest renewal activities, in that they assist in returning sites harvested for timber back to forested stand conditions, can be a positive influence in assisting to reproduce the forest stand conditions that support various forest product habitats. Chemical stand tending activities may, however, pose a concern to marketers of non-timber forest products from specific sites at which these activities are undertaken.

Chemical stand tending, utilizing application of herbicides, can have site-specific impacts to the harvest of non-timber forest products in terms of the organic certification process. To maximize profits the non-timber forest products industry markets wild edible and medicinal plants under organic certification. The use of herbicides in the vicinity of harvesting these wild products could impact the opportunity for organic certification.

- Communication, as indicated earlier, is an important mitigative tool that is available to advise Tembec of high value sites to incorporate these values, with the forest renewal requirements, in determining stand-tending requirements. As part of the permitting process, proposed treatment areas are advertised for public information and response providing opportunity for input of any concerns. Local communities are also provided with advance notification and maps of proposed treatment locations providing additional opportunity for input of any concerns (WDS – 014). In a landscape context these potential impacts are insignificant.

Forest Protection

As with forest renewal, forest protection activities will generally benefit non-timber forest products values on a site-specific basis where such activities are undertaken in protecting identified timber and non-timber values. As with stand tending activities, the application of chemicals in conjunction with insect and disease control activities can have an impact upon organic certification of non-timber forest products in affected areas.

Insect and disease control, which is the responsibility of MC, has similar potential for impacts to organic certification of non-timber forest products as chemical stand tending. Applications of chemicals for these purposes are infrequent and limited in extent to locations of identified values and risk of infection, resulting in insignificant impacts in a landscape context.

- Similar public notification procedures allow opportunity for identification of specific concerns relative to any required spray programs.

Forest fire control can have a significant positive impact on non-timber forest products in terms of protection of forest habitat that provide the conditions suitable for growth of these plants.

Harvesting of non-timber forest products represents a component of the livelihood and lifestyle of some residents within FML 01. Harvest success is dependent on weather conditions (for some products), access to harvest areas and current market demand. Non-timber forest products are impacted through disturbance of habitat from harvest blocks and indirectly from chemical use for stand tending and to lesser extent, insect and disease control. The NTFP industry may depend on the ability of the producer to obtain organic certification for their products.

Mitigation efforts include the spatial and temporal planning of forest activities to complement the harvest periods of the products. Significant positive impacts result from an increase in access for harvest opportunity and through forest fire control.

7.5.3.15 Mining

The geology and landforms of FML 01 have provided mining exploration and extraction opportunities that include industrial minerals, precious metals and aggregate stone. Two greenstone belts occur within the southeast portion of FML 01. This area was host to a number of gold mining operations from the 1920's to the 1960's, including the San Antonio Mine in Bissett which is the only gold mine currently operating on the FML under the present ownership of Rice Lake Gold Corp. Tantalum Mining Corporation of Canada operates a mining facility near Bernic Lake producing tantalum, spodumene and cesium; however, the recession of 2009 has resulted in the reduction of 80 jobs and the resultant production of cesium only. Mustang Minerals Corp. is conducting feasibility study work for the Maskwa Nickel Project which is (<http://www.mustangminerals.com>, September 16, 2009) investigating the potential to re-open and expand an open pit nickel mine in Nopiming Park . A number of quarry operations have been developed throughout both the east and west sides of Lake

Winnipeg for production of dimensional and crushed stone as well as for sources of gravel. (Manitoba Energy and Mines 1988).

Outside of site specific, land use conversions of areas that are utilized for mining activities, the forestry and mining resource industries are generally compatible, particularly in terms of the use of road infrastructure to access resources.

Planning

Planning activities provide the opportunity for Tembec to liaison with other industrial resource users, including the mining sector, to capitalize upon areas of mutual interest and minimize potential areas of concern. In the case of the mining sector the development of road access, important to both industries to enable development and management of the respective resources of interest, can be of particular interest for both parties.

Public participation provides opportunity for mining interests to participate in the planning process of Tembec including indication of areas and access routes of mutual interest and any particular areas of concern.

Road and watercourse crossing planning can provide opportunity for positive benefits to the mining industry in enabling both industries to review plans where areas of mutual interest exist. There may, at times, be situations where opportunities present themselves for joint development of access thereby decreasing overall road development impacts on the landscape and costs.

Access management and public use of roads constructed by Tembec can provide a positive impact to the mining sector through availability of this access for mineral exploration and development. Under the Tembec FML Agreement, all roads developed by the Company are available for public use, including use by the mining sector for exploration activities. This can translate into increased access and opportunities into new areas as well as decreased costs from road construction. Where both industries can make use of common access, there is an added benefit in that less disturbance to forested areas will be necessary than would be necessary to develop the same area of interest by both resource industries.

Harvesting

Harvesting operations undertaken in areas of mutual interest to the mining sector can result in site-specific impacts where mining claims have been staked.

Logging activities can result in impacts related to damage to claim posts in specific areas where this activity has been undertaken by the mining sector.

- Public communication processes with the mining industry, Tembec's monitoring of the Manitoba Industry Economic Development and Mines mining claim database (FSP Figure 3.16) and the MC IRMT approval process, which considers other resource values, allows for mitigation of this concern. This impact is insignificant in a landscape context.

Mining and forestry are compatible resource industries apart from some level of permanent land use by the mining sector in occupying mine site locations. Forest management impacts relate to potential for damage of claim posts during road construction and harvest operations, with mitigation available for identification of this concern through the Manitoba Industry Economic Development and Mines mining claim database. Positive impacts are realized through the availability of access roads for mineral exploration.

7.5.3.16 Natural Lands and Special Places

Natural lands and special places include areas identified in a formal context in Manitoba as those that contribute as designated areas for representation of habitats, species, natural lands, resources and heritage sites (ME 1997). Federal and provincial parks, ecological reserves, wildlife management areas, provincial forests and heritage sites contribute to this objective. As reported by Peckett (1999) these special places, designated based upon varying levels of land use, assist in meeting the desire to ensure that natural land values will be maintained for future generations.

All or portions of the following special places are within the boundaries of FML 01 (FSP Section 3.5.2).

Provincial Parks:

- Nopiming Provincial Park
- Atikaki Provincial Park
- Manigotagan River Provincial Park

Heritage Rivers

- Bloodvein River

Ecological Reserves

- Springer Lake Ecological Reserve (proposed)

Wildlife Management Areas

- Observation Point Wildlife Management Area

Heritage Resources

- Known locations of historic campsites and workshops, trading posts, pictographs and petroforms are input into the Tembec GIS database from information provided by Manitoba Culture, Heritage and Citizenship Historic Resources Branch.

To the extent that forest management activities are undertaken adjacent to special places these activities can impact special places. The recognition afforded to special places as distinct locations enables Tembec and MC to identify and incorporate requirements for these values at the planning stage. As such, potential impacts are discussed as they relate to these planning activities. Planning of forest management activities will incorporate identified special places and respect development restrictions adjacent to these areas. Operating procedures in

implementing plans incorporate the range of mitigating practices available including VRL, buffer and corridor leave areas and access management activities to protect resource values adjacent to the boundary of special places.

Planning

As indicated above, consideration of special places and incorporation of these values occurs at the planning stage of forest management activities. All of the special places identified above are not available for forest management activities, except for site specific heritage resources, including all of Nopiming Park in which Manitoba prohibited commercial timber harvesting effective April 1, 2009.

- Identified heritage resources are maintained by Tembec in a special use area GIS coverage which allows for the identification of the sites during the initial planning phase. These sites are designated for protection or site specific prescriptions may be applied, if deemed appropriate, through discussions with Manitoba Culture, Heritage and Citizenship Historic Resources Branch or the community that has originally identified the special use area (WDS-010).

Public participation can provide positive benefits in terms of considerations to be brought forward in planning forest management activities in and adjacent to special places. Joint planning, community meetings, the SFMAC and input received from NGOs is complementary to on-going dialogue between Tembec and MC in planning and implementing forest management activities for special places. These forums all provide continuing input relating to the non-timber values that comprise these locations and the mitigation requirements that need to be developed to maintain these values.

Road, watercourse crossing and harvest planning can significantly impact special places as a result of the location and design of these activities within and adjacent to the boundaries of special places or the implementation of operating practices inconsistent with the resource values. The identification of special places boundaries and respective values into the Tembec GIS database and the application of this information for planning allows for incorporation of these locations at the planning stage for planning of forest management activities and the appropriate mitigative actions to be taken.

- Planning for all forest management activities undertaken in FML 01, including those adjacent to special places, includes a public participation component as described in the FSP (Section 2.1 and 2.2) and above. In addition, all planned activities are evaluated by MC, particularly by the applicable IRMT, in terms of planned location and design as well as the appropriateness of the implementation procedures to be used. For special places, this evaluation allows for the consideration of the particular values of the area in approving and monitoring operations. In the case of heritage resources, the flexibility available to route selection for road development can assist in mitigation where identification of heritage sites is established.

- Complementary to this process, Indicator 5.1.4.2 of the LLI framework tracks issues identified and dealt with regarding non-timber resource values.
- Also related to special places as well as other areas of FML 01, Indicator 6.3.2.2 tracks the protection of identified special use areas and areas of concern identified in AORP's as brought forward during joint planning with first nations and other public consultation processes.

Information collection and application is a positive benefit to the management of activities to take place in special places. Following up upon the information provided through government sources related to the values for special places (including heritage resources), the PHA process undertaken for each cutblock and proposed all-weather road location provides opportunity to obtain specific additional information, including heritage resource sites. This information provides the basis for site-specific mitigation development to maintain identified values.

Access management can provide positive impacts through incorporation of special places values in developing access and access management plans for these areas. As part of an overall plan for these areas, access created during forest management activities can improve opportunities for tourism and recreation to provincial parks and provincial forests for public recreational use.

Several categories of special places fall within the boundaries of FML 01. The boundaries of special places are recognized and incorporated at the planning stage, as well as a series of mitigating practices from the EMS procedures and MC guidelines. Mitigation is accomplished through these planning processes and implementation of approved practices with evaluation and approval through the MC IRMTs.

7.5.3.17 Protected Areas

The *Natural Lands and Special Places Strategy* has been established by Manitoba in support of its commitment to the *Endangered Spaces Campaign* of World Wildlife Fund (WWF). To contribute to the goal of establishing a network of protected areas representative of each of the natural regions of Manitoba, protected lands from within special places, as described above in Section 3.5.2, and other protected areas, are being identified, established, and tracked by Manitoba (ME 1995).

The process of identifying lands for potential inclusion in the protected land base incorporates analysis of enduring features for these lands in the context of the overall land base. Enduring features are physiographic components (surficial deposits, soil, terrain features) of the landscape which, along with climate and micro-climate, define the landscape level variation and pattern as reflected by flora and fauna (biological diversity). Kavanaugh and Iacobelli (undated) for the purposes of the endangered Spaces Campaign describe an enduring feature as; “*a landscape element or unit characterized by relatively uniform origin and type of surficial deposits and topography...areas that can be identified and mapped at scales of 1:500 000 – 1:1 000 000.*”

The process of identification of areas that could potentially contribute to the protected land base of Manitoba is currently on-going throughout the province, including the area encompassed by FML 01. The FML Agreement with Manitoba provides for the re-allocation of areas from within FML 01 to meet specific needs, including protected areas initiatives.

In terms of potential impacts of forest management activities as they relate to protected areas, the incorporation of these identified protected areas at the planning stage allows for the planning of activities to avoid such recognized protected areas. Public participation in the identification of non-timber values for FML 01 has included a variety of values that are in part, accommodated through establishment of protected areas. Such public input and the mechanism provided through the establishment of protected areas assists in the overall goals and targets of the C & I framework for FML 01. The planning of road development and harvesting and renewal operations to limit operations to areas outside of the established and recognized boundaries of protected areas provides mitigation of potential impacts in terms of these areas. The protection or establishment of site specific prescriptions for other identified special places and heritage resources provides mitigation of potential impacts in terms of these areas.

7.5.3.18 First Nations Traditional Forest Uses

Treaty No. 1 was signed in 1871 between Her Majesty the Queen and the Chippawa and Cree Indians of Manitoba. Treaty 1 area is located south west of the FML commencing at the Winnipeg River. Treaty 1 First Nations in and adjacent to the FML would include Sagkeeng First Nation and Brokenhead Ojibway Nation. Treaty No. 3 was signed in 1873 between Her Majesty the Queen and the Saulteaux Tribe of the Ojibbeway Indians. Treaty 3 area encompasses the southern portion of the FML and borders Treaty 1 to the west and Treaty 5 to the north. Treaty 3 First Nations adjacent to the FML are located in Ontario and include One Man Lake, Wabaseemoong and Swan Lake First Nations. Treaty No. 5 was signed in 1875 between Her Majesty the Queen and the Saulteaux and Swampy Cree Tribes of Indians. Treaty 5 area encompasses the northern portion of the FML and lies north of Treaty 3 and predominately east and north of Lake Winnipeg. Treaty 5 First Nations in and adjacent to the FML would include Black River, Hollow Water and Bloodvein First Nations.

The numbered treaties, identified above, provided Aboriginals the right to hunt and fish on all ceded land not used for settlement, lumbering and mining but was only promised in writing from Treaty No. 3 onward. The *Shoal Lake Watershed Management Plan* (SLWWG 2002), which includes Treaty 3 First Nations, identifies traditional uses and activities as “fishing; trapping and hunting; gathering or harvesting of berries, wild rice or medicinal plants; and the preservation and use of sites of special significance”. The impact of forest management activities on sites of special significance is addressed in Section 8 of the EIS within the Participation by First Nations in Sustainable Forest Management section. The Natural Resource Transfer Agreement (NRTA), part of the 1930 Constitution Act, provides that Indian people “have the right, which the Province hereby assures of them, of hunting, trapping and fishing game and fish for food at all seasons of the year on all unoccupied Crown lands and on any other lands to which they may have right of access.”

Sagkeeng First Nation has filed a Statement of Claim, file # C107-01-52308, against the Attorney General of Canada and the Government of Manitoba seeking unextinguished Aboriginal Title to lands which have been traditionally used and occupied by its people since time immemorial (<http://www.sagkeeng.ca>, Sept 2009). This includes lands outside of the Treaty 1 area, which encompasses the southern portion of the FML.

Brokenhead Ojibway Nation is a signatory to the Treaty Land Entitlement Framework Agreement. The Framework Agreement settles the land debt that is owed to the First Nation that did not receive all the lands that they were entitled to under the Treaties 1,3,4,5,6 and 10 (<http://tlec.ca>, Sept 2009). Brokenhead Ojibway Nation has filed a TLE Claim for one parcel of land on the FML (FSP Section 4.1, Appendix 1, Map 2 and Table 3.5).

Planning

Planning activities have the potential to impact First Nation traditional forest use in the FML 01 in terms of the location and design of watercourse crossings associated with road development, harvest planning for cutblocks and roads and information collection.

- The Sagkeeng First Nation Statement of Claim, identified above, seeks recognition of their right to manage, use and occupy their land. The courts will have to determine whether a First Nation has land rights outside its Treaty area. The FML Agreement, between Manitoba and Tembec, reserves the right of Manitoba to remove areas within the FML which may be exercised based on the outcome of the Statement of Claim.
- The Brokenhead Ojibway Nation TLE claim, identified above, was accounted for by MC in the development of the base case wood supply analysis (FSP Section 4.1). The claim area was removed from the land base available for the determination of the sustainable harvest level.

Public participation involving discussions with First Nation and Aboriginal community members and representatives during the planning process provides a positive benefit in providing opportunity for communication of planned operations (road routes, crossing sites and harvest areas) in relation to areas utilized for fishing, hunting or gathering in order to incorporate these activities and sites in developing mitigation.

Road and watercourse crossing planning can have a significant impact on the gathering of medicinal plants, berries or other non-timber resources in relation to the location and the class of road (duration) selected for access routes throughout FML 01. The planning of road or crossing locations can significantly impact known and unknown site specific locations of plants which may be gathered for food or medicinal use. The planning of roads or crossings may have a positive effect by creating access to areas that were previously inaccessible, which increases the potential for hunting, fishing or gathering activities.

- Mitigation can be accomplished through road route planning, which takes these values into consideration as described in WDS – 004 and 009.

- A FSP management objective (Section 5.3.1.3.2) has been established to limit road construction to 0.58 km./km², by watershed, which limits the extent of road construction and potentially decreases the area which could be taken up by roads.
- Indicator 5.1.3.2 requires the completion of a road management plan for the existing and proposed road network, which seeks input from the local communities and other interested individuals.

Harvest & renewal planning can similarly impact sites which may be suitable for the gathering of medicinal plants, berries or other non-timber resources, though to a greater extent than roads given the larger area affected through timber harvesting. Harvest planning may result in the creation of early successional stage of forest stands which can have a positive impact on the establishment of browse species favoured by ungulate species desired for hunting.

- The forest renewal objective to return harvested sites to species of a similar composition as previously existed on the site, as soon as possible, (FSP Section 5.14.3) will assist in maintaining the species composition of the forest and the potential for the eventual re-establishment of the species desired for gathering, as forest succession occurs.
- The sustainability modeling (FSP Section 4.3) limits the extent of harvesting which may occur in any five year period which assists in mitigating the impact on sites that may contain species suitable for the gathering of medicinal plants, berries or other non-timber resources.

Information collection and application can assist in a positive way to the development of mitigation at the planning level. Information obtained from joint planning with communities in regard to hunting, fishing and gathering (WDS –004) can identify sites of concern.

- Joint planning and other public participation forums provide opportunity for the identification of known sites used for the gathering of medicinal plants, berries or other non-timber resources. Mitigation can include avoidance or protection of important areas and the identification of potential new sites. Watercourse crossing locations may be modified based on the potential impact to sites used for fishing.

Infrastructure Development

Infrastructure development related to road and watercourse crossing construction can significantly impact sites where medicinal plants, berries or other non-timber resources may be present. At the same time, these developments provide access to areas that were previously inaccessible and increase the potential for hunting, fishing and gathering.

All-weather road and permanent watercourse crossing construction is permanent in design and creates a significant impact on vegetation growing on those sites, which may be used for the collection of medicinal plants or food, due to the permanent removal of vegetation on

these areas. At the same time, these developments provide access to new areas which can be used for hunting and gathering and improves access to waterways for fishing which were previously only accessible by boat or canoe. These impacts are expected to be significant and non-mitigable in terms of supporting species, used for gathering, on these sites.

- As identified within the planning section above, joint planning, other public participation forums and the development of road management plans (WDS-004 and 009) provides opportunity for the identification of known sites used for the gathering of medicinal plants, berries or other non-timber resources. Mitigation can include avoidance or protection of important areas and the identification of potential new sites.

Dry weather and winter road construction, similar to all-weather road construction, creates a significant impact on vegetation growing on those sites; however, as these activities are temporary in nature, the impact is mitigable. Positive impacts from the creation of new access are similar to all-weather road construction for increased hunting and fishing opportunities except the access is only available while the infrastructure is maintained in place.

- Forest renewal practices aimed at re-establishing trees and vegetation on these sites (WDS-WI-039) assists in the initial re-vegetation of these areas which allows for further ingress of species from the surrounding area through seed dispersal and root rhizomes and the eventual forest succession processes to take place.

Decommissioning of roads and watercourse crossings restricts the ability of First Nation people to access areas used for hunting, fishing and gathering. The impact is insignificant as it was the very development of the infrastructure which led to improved opportunities to practice traditional uses of the forest in those areas. Traditional uses are allowed to take place as they were before the infrastructure was developed.

Harvesting

As identified in the harvest planning section above, timber harvesting can significantly impact sites which may be suitable for the gathering of medicinal plants, berries or other non-timber resources. Timber harvesting and the subsequent forest renewal activities can have a positive impact on the establishment of browse species favoured by ungulate species desired for hunting.

Logging activities remove the majority of the tree species within the harvest blocks except for the areas remaining through VRL practices. The vegetation species desired for gathering are similarly disturbed just as they would be through natural disturbances such as forest fires. The disturbance to vegetation species is reduced by the use of winter harvesting which creates less soil and vegetation disturbance due to the frozen ground conditions and the protective snow layer. Ehnes (1998), in assessing the effects of fire and winter harvesting on plant communities, determined that winter harvesting maintained some species which were not present following large forest fires which provides the opportunity for species desired for gathering to be maintained to some degree following winter harvesting. VRL harvesting

practices and MC Wildlife Guidelines (MNR 1984) maintains structure within harvest areas which supports the use of the harvest areas by ungulate species. Timber harvesting, and the subsequent forest renewal, returns the site to an early successional stage preferred by ungulate species for browsing. This provides a positive impact in terms of hunting opportunities in newly harvested sites.

- Mitigation is achieved through riparian buffers, VRL practices and prompt forest renewal of the cutblocks including:
 - Variable buffers for riparian area protection (MC 2008) which are high use areas by ungulate species.
 - Understory vegetation retention, particularly adjacent to wetland areas and waterbodies (WDS-004, 005, 006 and 048).
 - Forest renewal practices designed to return harvest areas to species compositions similar to those that existed prior to harvest (FSP Section 5.14.3).
 - Forest succession which supports the re-establishment of vegetation species native to the site as the reforested area matures.
- Design of harvest areas to approximate natural disturbance patterns including utilization of natural stand boundaries in development of cutblock design, to the extent practical and application of varying cutblock sizes and shapes, will assist at the landscape level in assisting wildlife movement and providing thermal and escape cover (WDS – 010).

Forest Renewal

In a general sense, forest renewal activities, in that they assist in returning sites harvested for timber back to forested stand conditions, can be a positive influence in assisting to reproduce the forest stand conditions that support wildlife habitats and desired vegetation species. Chemical stand tending activities may, however, pose a concern in relation to desired vegetation species remaining after harvest or early development species such as blueberries which are sought for food.

Chemical stand tending, utilizing the application of herbicides, can have insignificant impacts to the gathering of traditional use vegetation species due to mitigative practices in place. Communication, as indicated earlier, is an important mitigative tool that is available to advise Tembec of high value sites to incorporate these values, with the forest renewal requirements, in determining stand-tending requirements. As part of the permitting process, proposed treatment areas are advertised for public information and information packages and maps of proposed areas are provided to First Nation communities' prior to treatment (WDS – 014). In a landscape context these potential impacts are insignificant.

- WDS-014 restricts the application of herbicides to 25 percent of the total harvest area and promotes the use of ground application techniques that uses a low per hectare dose which assists in maintaining some vegetation species.

- Harvest sites which naturally support blueberry plants occur on nutrient poor, coarse textured soils which do not support the development of species that would create a competition problem for the establishment and development of forest tree species. For that reason, sites that support good blueberry production following harvest are not identified for herbicide treatment.

Forest management activities may create significant impacts to First Nations traditional forest use which are both mitigable and non-mitigable in terms of vegetation species desired for the gathering of medicinal plants and food. At the same time, these activities create positive impacts in terms of increased access for hunting and fishing and provide the opportunity for the identification of new areas, previously inaccessible, for the gathering of desired vegetation species.