labour force age in the economy in the region in 2001 was 61%. The majority of the labour force was employed in other services (60%), followed by agricultural and other resource industries (10%), wholesale and retail trade (9%), manufacturing and construction industries (7%), health and education (7%), and business services (6%). Unemployment in the region was estimated to be about 7%, and was higher for females than for males. Education levels among the potential labour force within the region were reviewed based on 2001 Census data. The percent of the total population (15 years and over) attending school full time was 45%, while those attending part time was 15%. The percent of the total population (aged 20 – 64) with less than a high school graduation certificate was 70%. Based on the 2001 Census, the average earnings of those working the full year, full time was approximately $32,613. Persons 15 years of age and over with an income totalled approximately 550.

4.3.2 Property Ownership

The majority of the land within the project study area is Crown-owned. This area has been surveyed on the basis of the section-township-range system. Publicly or Crown-owned areas consist of associated Crown lands (i.e. provincial park) in addition to all water-bodies, streams, rivers and creeks. The Crown also owns Provincial and municipal road allowances. Waterpower license areas and waterpower reserves have been set-aside for Manitoba Hydro for the construction and operation of dams and other hydroelectric works. These reserves are located along the shores of the Winnipeg River. Manitoba Hydro has a long-term lease with Manitoba Conservation for the area encompassing the town site of Pointe du Bois and the generating station, extending down to the Slave Falls Generating Station. Most cottages and commercial operators are located on leased land. Some private land is located within the park in the vicinity of the townsite of Pointe du Bois (along the existing tramway) and south of Eight Foot Falls.

4.3.3 Infrastructure and Services

The project study area includes several infrastructure networks and facilities. The networks include linear corridors and rights-of-way for provincial roadways (i.e. PR 313) and Manitoba Hydro transmission lines. Other infrastructure facilities include an active waste dump south of PR 313 and west of the community (which is used by cottagers), a tank site, a fire tower, and a communication tower at Pointe du Bois. Other secondary access roads connect to cottaging and camping areas in the vicinity to the north and south of Pointe du Bois Generating Station.

4.3.4 Personal, Family and Community Life

The following provides information on topics related to personal, family and community life in the project study area.

Population

The study area is located entirely within Division No. 1, Unorganized Territory based on Statistics Canada boundaries. The population of this larger region, according to the 2006 Census, is 1,130. This compares to a total population of 670 noted in 2001. The population density per sq. km. for the unorganized territory is 0.3 with a total land area of 4,129 sq. km. (Statistics Canada, 2006). According to the 2006 Census, there were 469 occupied private dwellings within this region.

Aesthetics

The appearance of the project area varies with topography and vegetation of the natural landscape, as well as the degree of human activity associated with nearby settlements and with the use of the land/resource base. Much of the study area is forested although there are established cottages and developments in the area. Cottagers have indicated a strong appreciation for the aesthetic quality of the study area.

Culture and Way of Life

The community at Pointe du Bois grew with the generating station, beginning with its construction. Before there was a road connection to the dam site, many of those who worked at the generating station were required to live in the community, which included staff housing and its own volunteer fire department. In its day, the community boasted a medical clinic, an employee-owned store, a church, school, skating rink, curling rink and a community hall. It was a viable community located amidst a bustling recreation industry, mainly fishing lodges and camps (Manitoba Hydro, 2002). Today, the school is now the community recreation centre and Manitoba Hydro offices and the store is privately operated.

The cottagers at Pointe du Bois represent a distinct group. Many cottagers are long-time residents and some are descendents of people who were involved in the construction at the Pointe du Bois dam site and or worked for Winnipeg Hydro. An important cultural value held by current cottagers in the vicinity of Pointe du Bois is the sense of connection to the area and the

sense of isolation they experience. Based on a survey of cottagers conducted in 2007, respondents reported that on average they and their families have had their cottage for 28 years. While a comparatively small number of cottagers use their properties as their primary residence, preliminary results from the survey of cottagers indicate that a small majority spend at least a short period of time each season at their cottage. However, only a small minority spend more than half of the winter season at the cottage, with most use occurring during the summer months.

When asked about what the most important factors were in the use of their cottage, a majority of respondents indicated that the scenery surrounding the cottage, the presence of wilderness and wildlife, use of the area for recreational activities and for peace and quiet were rated as being extremely important. The two most important factors chosen by respondents as the single-most common reason for using their cottage included using their cottage for recreational activities followed by peace and quiet.

Ways of life in the project study area and larger region vary. There are likely few project area residents that continue to subsist entirely on the resource economy, although those that do have a strong connection to the land. According to the 2007 survey of cottagers, the most common activities that respondents and their immediate families participated in included: fishing, walking or hiking, swimming, gathering such as berry-picking, and wildlife watching, birding or nature photography.

Community Organization

There is little in the way of community organization in the study area. Some of the houses at Pointe du Bois date back to 1923, while others have been modernized. The adjacent community is largely comprised of cottage users. There is a cottagers association (The Pointe du Bois Cottagers Association) which is a volunteer-based organization under the umbrella of the Whiteshell Cottagers Association.

4.3.5 Aboriginal Land and Resource Use

There are currently no known treaty land entitlements in the study area. There is likely traditional land use interest in the project study area.

These traditional use areas may stem from uses of the Winnipeg River system. These uses are

traditional in that they predate European contact but continue today, notwithstanding their adaptation over time to changing historical circumstances and outside forces.

4.3.6 Commercial Resource Use

Forestry

The project study area is located within Forest Management Unit No. 30. There are several designated cutting areas within the study area that allows the local removal of 2 to 3 cords of firewood under permit. It was noted during the environmental assessment consultation that a cutting permit has previously been issued to a third party operator for aspen in the study area. Manitoba Conservation has advised that there have been no forestry permits issued for this area in the last three years. Adjacent lands to the west of the study area in the RM of Alexander are designated for forest management under Province of Manitoba Crown Land Operational Plans (2006).

Trapping

Trapping is common both within and outside the park area. The area between Pointe du Bois and Slave Falls is located within the Whiteshell Registered Trapping District, specifically Section 24; however, no trapping is permitted on property leased by Manitoba Hydro. One trapper's cabin is located within the study area and one registered Trap Line Permit and one registered Trap Line Helpers Permit have been issued in this area.

Lodges and Outfitting

There are two commercial lodges and two outfitters operating in the Pointe du Bois and surrounding Whiteshell area that have non-resident wildlife allocations. Trail End Camp & Outfitters, Eaglenest Lodge, and Whiteshell Outfitters all have specific black bear allocation areas, which are outside of the immediate project study area. Both Trail End Camp & Outfitters and Eaglenest Lodge also offer non-resident hunting for whitetail deer as well as fishing services. Whiteshell Outfitters also offers non-resident hunting for waterfowl and upland game birds, an outcamp for deer hunts and fishing services. George Lake Outfitters offers non-resident hunting for whitetail deer with accommodation (i.e., backcountry camping on George Lake) and fishing. Additional non-lodge wildlife allocations also exist in the project study area and adjacent Whiteshell region. The immediate project study area and surrounding region fall within Areas 2 and 3 of Game Hunting Area (GHA) 26, which are designated for bows, bears

and bucks outfitters. Within these areas, non-lodge outfitting for deer and bear can occur anywhere within the game hunting area. Other lodges in the Whiteshell region that offer fishing only services along the Winnipeg River include Eagle Nest Landing, Kendall Point Lodge and Pine Island Lodge.

Commercial Fishing

There is one active commercial bait block in the vicinity on the Winnipeg River. The Pointe du Bois commercial bait block (176), which encompasses approximately 120 square miles, currently has two allocations for bait fish harvesting and two allocations for leech harvesting.

Wild Rice Harvesting

No wild rice harvesting licenses have been issued recently on the Winnipeg River system in the study area, although some may exist on smaller tributaries and lakes back of the river. There are no production records for wild rice in the study area.

Gravel

There are few quality gravel deposits in the study area; however, some small pockets of sand and gravel have been identified in the park area. Three Crown sand and gravel pits have been identified at, and just northwest of, Pointe du Bois along PR 313.

Mining

No mining claims or leases are registered between Pointe du Bois and south along the Winnipeg River shoreline to Slave Falls in Whiteshell Provincial Park. Quarry rights to this area within the park have been withdrawn and mining is restricted.

4.3.7 Recreational Resource Use and Tourism

Whiteshell Provincial Park is classified as a Natural Park within the Province of Manitoba's most recent Parks System Plan (1996). Land uses in provincial parks are classified according to land use categories. Land use in the vicinity of Pointe du Bois, Eight Foot Falls and the Slave Falls Generating Station and surrounding area is categorized as Recreational Development and Resource Management. These categories provide for recreational opportunities including canoeing, sport fishing, hunting, snowmobiling, hiking, horseback riding, cross-country skiing and intensive recreational facilities including campgrounds and cottage subdivisions. Forestry,

trapping, mining and wild rice harvesting are also permitted in these categories. None of the area adjoining the river is designated as Backcountry or Wilderness.

Recreational opportunities within Whiteshell Provincial Park are mainly water-oriented, given the dense network of lakes, rivers and streams, including the Winnipeg River. These activities include: swimming, fishing, canoeing and kayaking, sailing, power boating, water skiing and jet-skiing. Recreational hunting occurs throughout the area at various times of the year in accordance with provincial regulations.

Within the project study area, there is intensive cottage development. As noted previously, most of the cottages are not permanently occupied, but a large percentage of cottagers use their properties in all seasons.

Two campgrounds are located near Pointe du Bois at Sawmill Bay and further downstream of the generating station at Eight Foot Falls. There are two fishing lodge operations located on the Winnipeg River in the area of Pointe du Bois: Eagle Nest Landing and Trail End Camp.

The Winnipeg River is a designated canoe route within Whiteshell Provincial Park. Several canoe campsites are located on island and shoreline locations upstream and downstream of Pointe du Bois. At Slave Falls Generating Station, a designated portage is on the east side of the river which does not cross the tramway.

There are few land-based recreational facilities at Pointe du Bois. There are no designated hiking, biking, cross-country ski or snowshoeing trails within the study area.

Snowmobiling occurs near and potentially along the existing tramway. Anecdotal information from Manitoba Conservation and Manitoba Hydro staff suggests that snowmobiles occasionally use the tramway in the winter. On the provincial snowmobile association website (SNOMAN) there is a marked bush trail that appears to follow the path of the tramway to the Slave Falls generating station. An interview with the local snowmobile club (Lee River Riders) suggest that this bush trail is rarely used as it does not link with any other trails or lead to a warm up cabin. This trail is also not maintained. Although specific numbers were not offered, the club representative indicated that there are “lots” of members from Pointe du Bois.

No data is available to quantify non-consumptive recreational resource use in the study area and specifically in the vicinity of the tramway. Anecdotal information from Manitoba Conservation and Manitoba Hydro staff suggests that occasional use is made of the tramway by

all terrain vehicles and walkers in the summer in addition to the winter snowmobiling. There is the potential for fishers wishing to access the area around the Slave Falls generating station to use the tramway for access.

Cottagers and/or immediate family members also participate in hunting, berry picking, picnicking, birding, wildlife viewing, biking, hiking, walking, and snowmobiling in the general area, and they may utilize the tramway route.

Other recreational opportunities with the Whiteshell include lodging, camping, hiking, nature interpretation, berry picking, and viewing wildlife. In the winter, the area caters to cross-country skiing, snowshoeing, ice-fishing, and snowmobiling enthusiasts. Cottaging is a significant land use and is particularly linked to extensive water-oriented recreation along the Winnipeg River system.

4.3.8 Heritage Resources

The Winnipeg River has been a major transportation route between the Lake of the Woods and Lake Winnipeg over at least the past thousand years. The earliest peoples (Plano Culture) used this travel corridor shortly after deglaciation. Representations of subsequent cultures include Old Copper, Laurel, Blackduck, and Selkirk, as well as several others. The intensive use of this transportation route reached its peak during the Fur Trade Period when it was the main route between the eastern headquarters of the Northwest Company and the western trading areas.

Figure 4.17 shows the locations of the archaeological sites located in the project area.

As would be expected along a heavily traveled route, numerous archaeological sites have been recorded along the banks of the Winnipeg River (Steinbring, 1980 and Buchner, 1982). Twenty-one archaeological sites along the river between Pointe du Bois and the Slave Falls generating station are recorded in the Manitoba Archaeological Site Database (HRB) which is maintained by the Historic Resources Branch, Manitoba Culture, Heritage and Tourism. An additional three sites are recorded immediately downstream of the Slave Falls Generating Station. During 2007, an archaeological team located four additional, previously unrecorded sites along the river

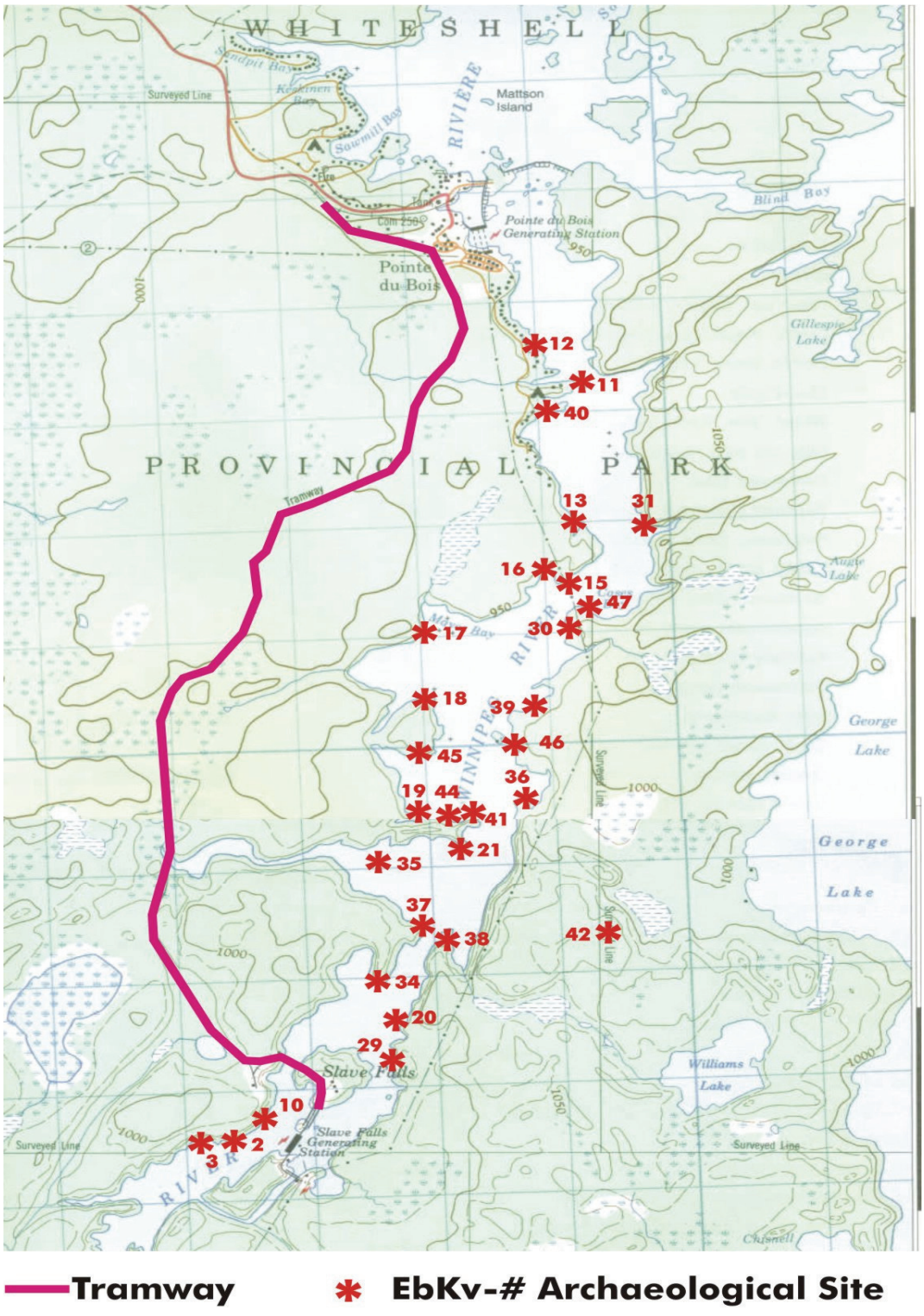

Figure 4.17: Archaeological Sites Located in the Project Area

(Northern Lights 2007a). Two are in the vicinity of Eight Foot Falls – one is on an island in the river (EbKv11) and the other (EbKv40) is immediately downstream of the falls. A third site (EbKv13) is approximately one km downstream of the falls on the west bank of the river, with a fourth site (EbKv14) slightly further downstream.

Most of the recorded sites pre-date the Fur Trade Period. The site (EbKv11) on the tip of a peninsula in the vicinity of Eight Foot Falls (an island at high water), appears to be the most complex with Oxbow, Hanna, McKean, and Late Woodland artifacts recorded at the site in 1973. A second site (EbKv40) was recorded in 1990 during a period when water levels were six feet below normal. Two other sites, EbKv13 and EbKv14, were recorded in 1973 and contained Late Woodland artifacts.

It is noted that with numerous campsite locations along the waterway, inland utilization would have occurred—animal hunting, bird hunting, food plant harvesting, and medicinal plant harvesting. These activities would have been short-term and undertaken by small task groups while the main encampment remained on the river. Most activities would have been in the nature of day trips and would have left little evidence of their occurrence.

5.0 ENVIRONMENTAL ASSESSMENT CONSULTATION

5.1 PROCESS

The environmental assessment consultation process for the Slave Falls Tramway Conversion Environmental Assessment Consultation Process (EACP) was carried out concurrently with the EACP for the Manitoba Hydro Pointe du Bois Modernization Project. A series of Public Open Houses and stakeholder meetings were held jointly for both projects.

The public and government consultation process for the EACP included the development of a stakeholder structure as a means of facilitating effective and manageable stakeholder consultations. The stakeholder structure was developed on the basis of a preliminary assessment of the potential for direct or indirect impacts to stakeholder groups. Stakeholder groups were assigned one of three Tiers depending on this preliminary assessment.

The EACP consisted of letters and meetings with potential stakeholders, and a series of Public Open Houses all occurring between July 2007 and December 2007. Ninety (90) stakeholder

groups were identified as part of the pre-planning consultation effort. Identified stakeholder groups included:

- Government Departments and Agencies
- Aboriginal Interests
- Municipalities and Municipal Associations
- Industries and Economic Interests (Trapping, Mining, Outfitting, etc.)
- Cottage Associations
- Recreation and Tourism Interests
- Environmental Groups

5.2 RESULTS

While not considered full environmental assessment consultation preliminary discussions with Sagkeeng First Nation, Brokenhead Ojibway Nation and the Manitoba Métis Federation indicated that key areas of interest or concern arising out of the discussions with Aboriginal groups are as follows:

- Participation

  There was an interest in participating in certain studies including the socio-economic and archaeological assessment, and in receiving the results of any studies as well as interest in assisting with the construction tender/RFP

- Access to the New Road and Cottage Development

  There was a desire by some that the road would remain private access only

- Roadway Design

  There was interest in the design standard of the roadway and the potential effect on fish as a result of the Moose Creek crossing

- Rare and Endangered Species

There was a request to receive a list of rare and endangered plant species found along the tramway and an indication of specific sensitive areas along the proposed roadway alignment

- Hunting Access

There was a request to continue access for local Métis for grouse hunting.

The key areas of interest or concern from other stakeholder groups arising out of the Public Open House meetings are as follows:

- Access and Security

  Mixed views regarding access to the proposed road: some participants felt that the road should be seen as an opportunity for more Manitobans to make use of the land for cottage development and recreational use, while others felt that the road should remain private in order to prevent these uses. Some, who felt the road should remain private, indicated a desire to ensure access was prevented adequately

- Impact to Highway 313

  Concern that the current poor condition of the roadway would be made worse due to increase in use from construction

- Roadway Alignment, Connection Points

  Interest in the proposed roadway alignment relative to the existing tramway alignment, and the planned connection point to PR313

- Tramway disposition

Interest in the intended treatment of the abandoned areas of the tramway

- Opportunity for Tourism and Recreational Uses

  Interest in allowing access via the new road to create more opportunities for tourism and recreational uses. Suggestion to retain track in order to offer tours

- Heritage

  Suggestion to preserve an old tram car for heritage value

- Use of Timber Harvested

  Interest in local use of any timber harvested as a result of clearing for the project

- Pointe du Bois Homes

  Suggestion to sell existing townsite homes for recreational use

- Construction Camp

  Desire to have construction camp removed from townsite and cottage area

- Potential Wildlife Disturbance

  Concern involving the likelihood of increased wildlife kills as a result of new vehicle traffic

- Noise

  Concern regarding construction noise

The information obtained from the consultation program were considered and addressed in the environmental assessment process. The full consultation report can be found in Appendix E.

6.0 EFFECTS AND MITIGATION

The following chapter describes the findings of the assessment process, the project effects, the mitigation measures that will be implemented, and the significance of any residual effects. Both positive and negative socio-economic and environmental effects are described.

This chapter also includes a cumulative effects assessment.

The following criteria were used to evaluate the significance of the effects of the proposed Project:

- Nature of the effect

- Magnitude of the effect
- Duration of the effect
- Frequency of the effect
- Spatial boundaries (project site, local area or regional)
- Reversibility of the effect

Manitoba Hydro's practice is to undertake project development in an environmentally acceptable manner. In addition to the specific mitigation measures identified, Manitoba Hydro's general environmental protection practices will be adhered to for the Slave Falls Tramway Conversion Project. The general environmental protection practices are outlined in Appendix F.

A site specific Environmental Protection Plan (EnvPP) will be developed to define specific mitigation measures to be applied to this project to minimize residual effects. The EnvPP will be prepared following environmental approval and prior to the initiation of major clearing and construction activities.

6.1 PHYSICAL ENVIRONMENT

6.1.1 Air Quality and Climate

Potential effects on climate and air quality can result from clearing, construction and operation, and maintenance activities. There will be a temporary increase in vehicular and equipment traffic during the clearing and construction phase of the project that will result in higher vehicle emissions and potential dust problems. The following mitigation measures will be implemented:

- Water spraying to alleviate potential dust problems throughout the spring, summer and fall construction period
- Maintaining equipment in good repair to minimize gaseous and particulate emissions

Hazardous materials could potentially be released into the air as a result of an accidental spill of solvents, fuels etc. during construction, operation or maintenance activities. The following mitigation measures will be implemented:

- Adherence to Manitoba Hydro's standard environmental protection practices with respect to properly storing fuels, lubricants and other potentially hazardous materials and refuelling vehicles within a dedicated area
- Appropriate spill containment measures and spill response equipment will be on site
- Contractors will be required to have an emergency response plan in place that is consistent with Manitoba Hydro's spill response procedures

Project effects on air quality and climate are considered to be local, short-term, minor and insignificant.

Greenhouse Gas Emissions

Construction

Manitoba Hydro estimates that construction activities will involve about 10 heavy duty commercial trucks hauling material, 1 to 2 earth moving machines, and employee personal vehicles. Due to the uncertainty of the amount of time that the construction vehicles will be operating and lack of good emission data for construction activity, it is difficult to estimate, with any accuracy, the amount of greenhouse gas emissions from the construction activity. There will be an additional contribution of greenhouse gas emissions from construction activity. The emissions will be local and short-term in duration and are expected to be insignificant in comparison with the total provincial green house gas emissions from transportation of 7.5 million tonnes (2005).

Operation

Greenhouse gas emission estimates were prepared for the road operation using Transport Canada's fuel efficiency by vehicle class rates and GHG Emission Factors.

GHG emissions were estimated on the basis of 200 Light Duty Passenger Vehicle trips per week (50 vehicles per day, four days per week) consisting of 120 pick-up trucks, minivans and sport utility vehicles trips travelling 262,080 km/year and 80 automobiles travelling 174,720 km/year, and 2 trips per week consisting of Heavy Duty Commercial vehicles travelling 4,368 km/year. Light duty trucks and cars were considered to be fuelled by 10% ethanol blended gasoline and the heavy duty commercial vehicles were considered to be fuelled by diesel.

Manitoba Hydro is investigating car pooling options or use of one or two vans to transport staff, however, the estimates for the EIS were made on the above individual vehicle use basis.

The annual vehicle kilometres travelled (VKT) was used to calculate the GHG Emission Estimates shown in Table 6.1.

Table 6.1: Summary GHG Emissions Estimates – Road Operation

Vehicle	Annual VKT	Fuel Efficiency (L/100km)	GHG Emission Factor (g/L CO_2e)	GHG Emissions (t/year CO_2e)
Light Duty Trucks	262,080	12.9	2,301	78
Light Duty Cars	174,720	10.0	2,231	39
Heavy Duty Trucks	4,378	30.6	2,757	4
			Total	**121**

The use of individual vehicles as outlined in Table 6.1 will result in a significant increase in green house gas emissions (121 t/year CO_2e) when compared to the current tramway operation (39 t/year CO_2e). The amount of greenhouse gas emissions from vehicle traffic on the road, however is insignificant when compared to the total provincial greenhouse gas emissions from transportation of 7.5 million tonnes (2005).

6.1.2 Groundwater Resources

There are no groundwater pollution hazard areas in the project study area. Aquifers are not likely to be polluted by infiltration from the surface. Minor shallow aquifers may exist, but are not reliable or significant sources of water. The following mitigation measures will be implemented:

- Adherence to Manitoba Hydro's standard environmental protection practices with respect to properly storing fuels, lubricants and other potentially hazardous materials and refuelling vehicles within a dedicated area
- Appropriate spill containment measures and spill response equipment will be on site

- Contractors will be required to have an emergency response plan in place that is consistent with Manitoba Hydro's spill response procedures

The potential for surface or groundwater contamination from construction and operation of the road is considered minor and insignificant.

6.1.3 Terrain and Soils

Construction activities will create some unavoidable disturbances to the terrain (i.e., soils) along the proposed road alignment. Areas where soils are exposed (i.e., staging and lay down areas) are potentially more susceptible to erosion (both wind and water). These potential effects can be mitigated through proper construction techniques and/or erosion control measures. The following mitigation measures will be implemented to reduce the potential impacts to soils and terrain:

- Access to work sites will be limited to the ROW, winter roads and existing access trails where necessary
- Clearing will be conducted in the winter
- Erosion control methods will be used in areas where there is a potential increase for wind erosion of exposed soils
- Efforts will be made to maintain existing drainage patterns along the proposed road alignment
- Construction activities will cease during wet conditions to reduce the potential for rutting and compaction
- Equipment will be fuelled at dedicated sites away from water areas. The on-site contractor will be required to have spill containment in place and an emergency response plan to deal with any potential spills

Potential project effects on terrain and soils are considered to be minor and insignificant.

6.2 BIOPHYSICAL ENVIRONMENT

6.2.1 Aquatic Resources and Habitat

Potential effects of the Slave Falls Tramway Conversion Project on the aquatic environment are expected to be restricted to two activities:

- The removal of the existing crossing at Moose Creek
- The placement of a new crossing near the headwaters of Moose Creek

Removal of the Existing Crossing

Potential effects to fish and fish habitat of the removal of the existing crossing at Moose Creek could include sedimentation, loss of vegetation, increased erosion, input of deleterious substances, and (if improperly timed) the disturbance of spawning activity. The following site-specific mitigation measures will be implemented:

- Follow the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat*
- Remove the existing crossing after June 15 to allow the spring spawning fish species and amphibians ample time to complete reproductive stages
- Remove the existing crossing so disturbance of emergent and floating vegetation and any rare aquatic plant is minimized
- Remove the existing crossing to full bank width and stream depth in order to avoid beaver use of the area and/or erosion of newly formed banks
- Maintain the existing drainage patterns and take appropriate measures in the vicinity of watercourses to provide erosion control and to prevent excessive siltation and sedimentation
- Avoid the addition of excessive suspended sediment to Moose Creek during removal through the use of appropriate construction techniques and/or silt fences
- Remove metal track, ties, and fill to a grade comparable with natural elevation

- Grade, rip-rap and vegetate the area as appropriate to accelerate natural re-growth of terrestrial and riparian vegetation

The potential effects during removal of the existing crossing at Moose Creek are considered to be minor and insignificant. Upon completion, the removal of the existing crossing will result in a net gain of fish habitat at the site.

Placement of New Crossing

Potential effects to fish and fish habitat of the new crossing at Moose Creek will be addressed by the following mitigation measures:

- Follow the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat*
- Complete a watershed profile to determine the optimum size of culvert required at the proposed site
- Size the culvert to span the stream width and accommodate local flows. Install the culvert below grade at similar gradient to stream bed and to be large enough to minimize damming by beaver
- Construct in-stream work to avoid spring flow conditions and fish spawning period
- Stabilize banks where work occurs close to the waters edge to avoid bank erosion and downstream sediments
- During construction, use silt fences and/or erosion control blankets on steep banks to prevent erosion and introduction of sediment to streams
- Develop permanent erosion measures consistent with the Manitoba stream crossing guidelines

The potential effects of the new crossing placement on fish and fish habitat are expected to be minor, site-specific, short term and insignificant.

6.2.2 Habitat and Ecosystems

The Project could affect terrestrial habitats and ecosystems through activities such as vegetation clearing, surface organic layer removal, soil excavation, equipment operation outside of designated clearing areas or construction access trails, airborne deposition of dust and chemical elements generated from vehicle traffic and fuel combustion, soil compaction, material stock piling, hydrological alterations and accidental events (e.g., fires or spills).

Potential direct effects of project activities on terrestrial habitat and ecosystems include:

- Habitat loss, disturbance and/or conversion
- Removal and/or disturbance of priority plant populations

Direct effects can lead to a number of indirect effects on habitats and local ecosystems in areas adjacent to the project footprints. Some examples are:

- Tree blowdown at the edges of newly created openings
- Altered plant species composition from dust, accidental spills and/or disturbance from construction or maintenance vehicles, increased recreational use
- Altered plant species composition from increased resource harvesting and recreational use that results from improved access
- Reductions in native plant populations by invasive non-native species that are introduced or spread by project activities or increased recreational use due to improved access
- Altered soil chemical and/or physical properties such as soil moisture and fertility
- Long term changes to plant species composition or soil properties due to higher fire frequency and/ or severity that results from project activities or improved access

Direct and indirect project effects on habitats and their plant components may also affect broad ecosystem properties such as biodiversity, fragmentation and wetland function. Potential project effects will be addressed in three broad classes:

- Habitat

- Rare Plant species
- Broad ecosystem effects other than habitat diversity

For the tramway conversion project, most measurable direct and indirect effects on terrestrial habitat or ecosystems are expected to be confined to the proposed road RoW, the borrow areas, the existing tramway RoW and a 20 m buffer of these areas. These areas are referred to as the habitat effects areas (for the proposed road, this corresponds with the RoW). There may be a few locations where project activities or improved access lead to effects that extend for a short distance outside of this area. Examples of these situations are road embankments in high slope areas and increased resource harvesting (e.g., plants, berries, fuelwood).

The habitat study area (Figure 4.2) was used to determine potential local terrestrial habitat, plant and broad ecosystem effects. The surrounding region was generally used to assess the significance of potential effects. However, even small local habitat losses and/ or disturbances can have important ecological effects if:

- They remove or disturb habitats or plant species that are critical for the survival and/or reproduction of another species or are especially important to people
- They remove or disturb plant populations that are rare, relict or near a range limit
- The habitat losses facilitate the introduction and/or spread of non-native invasive species
- They affect a broader ecosystem function such as biological diversity, habitat connectivity or wetland function

6.2.2.1 Habitat

Project activities account for 1.3% and 0.03% of the land area that is not occupied by human activity (non-human land) in the habitat study area and the surrounding region, respectively. Even if it is unrealistically assumed that all the terrestrial habitat in a 50 m buffer of the tramway and proposed road area is completely lost due to indirect effects, the total combined habitat loss is only 3.3% and 0.08% of the non-human land in the habitat study area and the surrounding region, respectively.

On the basis of land area alone, 96.7% of the non-human land in the habitat study area is not affected and the terrestrial habitat losses and disturbances directly associated with project activities under a worst case scenario are expected to be insignificant.

None of the habitat types in the tramway and proposed road area were identified as being critical mammal or bird habitat. Certain wetland habitat types were identified as being locally important for anurans. Wetland effects are considered in the Broad Ecosystem Effects sub-section. Stakeholder consultation conducted for the project did not reveal any specific habitat types that are especially important to people. Although attempts were made significant input was not received from First Nations people.

Ash forest on mineral soil is the only regionally rare FLI habitat type that occurs in the tramway and proposed road area. None of these FLI patches are within the habitat effects areas.

The tramway and proposed road area pass through an area of high habitat diversity relative to the surrounding region.

The following mitigation measures will be implemented as practical best efforts to minimize project effects on terrestrial habitat diversity and wetlands:

- Reduce RoW clearing within constraints of road design requirements
- Confine construction and operation activities along the road and existing tramway to the cleared RoW areas
- Remove tramway bed ballast to high water level in wetlands except where S1 or S2 rare plants exist
- Seed with native species and/or non-invasive grasses or herbs mixtures where appropriate

The actual extent of RoW clearing will be determined during the final design stage. Cleared width could be up to 50m for a substantial proportion of the roadway and higher in locations with steep grades.

The potential for any significant effects on habitat diversity depends on the final road location and extent of clearing along the southern half of the roadway. If the actual clearing width is near 50 m for most of the proposed southern half of the roadway then there is a low likelihood

that there will be significant adverse effects on habitat diversity. However, limiting clearing to approximately 20 m for as much of the southern half of the proposed roadway as possible, will reduce the likelihood of significant adverse effects on habitat diversity. A pre-construction survey and best efforts approach described in section 6.2.2.2, that includes reduced RoW clearing where possible will further reduce the already low likelihood of any significant effects.

6.2.2.2 Rare Plant Species

Approximately 27% of the habitat effects area was surveyed for rare plant species in June, July and August, 2007. A high proportion of the area surveyed was the existing tramway and the adjacent ditches.

None of the plant species identified in the surveys are currently listed by the Canada Species at Risk Act (SARA) or the Manitoba Endangered Species Act (MESA).

Approximately 5% of the species found during field surveys are ranked as S1 (very rare) to S3? (possibly uncommon) by the Manitoba Conservation Data Centre (CDC). Potential project effects on S1 and S2 (rare) species are of particular concern.

To determine project effects and identify mitigation measures on CDC ranked plant species Manitoba Hydro will implement a “Best Efforts” approach within the constraints of the road design requirement, cost and schedule. The “Best Efforts” approach involves Environmental Protection as follows:

- Conduct pre-construction field surveys to determine whether:
    - Additional field data indicates that some species ranked as high or moderate conservation concern for the EIS are more widespread and/or abundant in the project area than assumed for the environmental impact statement
        - If so, then reduce the local conservation concern ranking where appropriate and evaluate mitigation required
    - Additional species of high or moderate conservation concern occur in the project footprints shown in the environmental impact statement
- Map the overlap of project footprints with known locations of species of local conservation concern (add newly identified locations to EIS map)

- Modify road alignment to avoid known locations of species of conservation concern where possible within the constraints of the road design requirements, cost and schedule. Modifications to be limited to moving the centerline within the defined RoW (50m)

- RoW clearing will be reduced through areas where species of conservation concern are known or expected to occur. Reduced road speed limits would accommodate reduced RoW clearing. Evaluate where this is possible within the constraints of safety, the road design requirements, cost and schedule

- Leave abandoned tramway bed intact in areas containing species of high and moderate local conservation concern (rail and ties removed in these areas)

- Prior to construction, flag areas containing species of local conservation concern so they are protected/avoided according to the mitigation measures in the EIS and EnvPP

- Conduct construction and post-construction compliance monitoring as part of the Environmental Protection Plan activities to monitor contractor performance and determine whether mitigation measures were effective

If pre-construction field surveys determine that only a small proportion of the local populations of S1 and S2 species will be adversely affected after taking into account the best efforts approach outlined above, then it is highly likely that residual adverse effects on these species will be insignificant. However, if a large proportion of the local populations of S1 and S2 species are adversely affected after the best efforts mitigation, then it is moderately likely that residual effects on these species in the project study area will be adverse, significant and long-term.

It is unlikely but possible that species listed by MESA or SARA will be found during pre-construction rare plant surveys. If any listed species are found and cannot be avoided by the best efforts approach, then it is highly likely that there will be significant long-term adverse effects on these species.

Following the preconstruction survey, Manitoba Hydro will determine the best Environmental Protection Measures to implement in order to minimize project effects on rare plant species with Manitoba Conservation

6.2.2.3 Broad Ecosystem Issues

Broad ecosystem issues considered for the terrestrial ecosystem effects assessment include disturbance regime alterations, linear disturbance, fragmentation, indirect effects of improved access and net changes to wetland function.

Large wildfires are the dominant natural disturbance regime in the surrounding region. To mitigate the effect of the project on wildfires, the Environmental Protection Plan will include measures that minimize the risk of accidental fires. On this basis, it is highly likely that the project will have an insignificant effect on the frequency, intensity and/or severity of large fires in the region.

The length of the road and the projected traffic levels are too low to have a regional effect on habitat measures of linear disturbance or fragmentation, (e.g., linear feature density, core area index) especially considering that the road is replacing an operational tramway.

Access to the road will be restricted by physical barriers controlled by Manitoba Hydro. On this basis, the project is not expected to substantially increase harvesting of berries, plants, fuel wood or soils.

Access related project effects on habitat, plant or the broad ecosystem issues are expected to be insignificant.

Net effects of the project on wetland function are not expected. Diverting the proposed road inland and upland away from the large Moose Creek wetland complex reduces total wetland area loss to 4.9 ha. Other mitigation measures that will be considered to further reduce the extent and/or degree of wetland effects include:

- Winter clearing for road construction
- Reduce RoW clearing if possible, and maintain current drainage patterns
- Remove tramway bed ballast down to the high water level in the Moose Creek and southern wetland complex areas to encourage expansion of adjacent wetlands over the rail bed with beneficial effects for amphibians, other wildlife, and aquatic plants
- Promote natural regeneration of those portions of the existing tramway that are located outside of the proposed road and ditches

- To avoid promoting the spread of non-native plants, seed mixtures used for ditches and rehabilitation will only contain native species and herbs

Project effects on broad ecosystem issues are considered to be insignificant.

6.2.3 Mammals and Birds

Potential effects on birds and mammals in the study include both short-term direct effects from habitat loss and disruption during construction and possible long-term indirect effects as a result of project operation. The long-term indirect effects from habitat loss are minor relative to the habitat requirements for most terrestrial and avian wildlife. It is possible that some bird nests and mammal dens may be destroyed or disturbed from project related activities, however the magnitude of these effects are dependent upon timing of activities. Barred Owl and Cooper Hawk, each of which is a species of concern, are known to occur in the area and there is potential for disturbance or destruction of nesting sites. The effects of sensory disturbance on mammals and birds may increase as a result of increased traffic on the road compared to the existing tramway operation. Predator movement in the area (wolves) may be enhanced as a result of new road and could have some effect on local white-tailed deer numbers. Unauthorized or casual use of the new road for hunting or recreation may increase and negatively affect local white-tailed deer distribution and numbers. Riparian habitats are also important in the area and provide important life requisite habitat (nesting and feeding) for many birds and mammals and there is some potential for degradation or destruction of this locally important habitat. Any potential effects will be addressed by the following mitigation measures:

- Should any endangered or threatened wildlife species or habitat (e.g., nesting areas) be encountered during construction or maintenance activities, appropriate environmental protection measures will be implemented. These will be incorporated in the Environmental Protection Plan (EnvPP) developed for the project

- Related requirements for monitoring of wildlife, if required, will also be identified in the EnvPP

- Prohibit forest clearing during the period of April 1 to July 31 inclusive to avoid the destruction of active bird nests and to comply with the federal *Migratory Birds Convention Act*

Project effects on mammals and birds are considered to be short term and minor during construction and insignificant following project completion.

6.2.4 Reptiles and Amphibians

Reptiles

The existing tramway from Pointe du Bois to Slave Falls is believed to act as a partial barrier to turtle movement, and may cause some mortality within the local turtle population. The removal of the tramway rails may ultimately prove beneficial for the turtle community, as it would improve access to adjacent wetlands and decrease obstructions to turtle activity. The construction and operation of a road in the area will result in an increase in vehicular traffic and resulting dust adjacent to wetland habitat. Reptiles crossing the road to access wetlands on either side may be affected. However, as the road will be private, the traffic effects are considered to be minimal.

To minimize the potential effects to reptile habitat and species the following mitigation measure will be followed:

- To the degree practicable, rocky areas adjacent to road construction activities will be left intact for use by garter snakes

The potential effects of project construction and operation on reptiles are expected to be small, site-specific, short-term and insignificant.

Amphibians

The construction of a road along the tramway may include the infilling of small tramway-side wetland ditches that provide valuable anuran habitat particularly during breeding season. The area most affected would be in the vicinity of Moose Creek and its subsidiary wetlands. By aligning the road inland and upland away from major wetlands at Moose Creek, these important areas will be avoided to a large degree minimizing potential effects on the northern leopard frog as well as other anurans. The construction and operation of a road in the area will result in an increase in vehicular traffic and resulting dust adjacent to wetland habitat. Amphibians crossing the road to access wetlands on either side may be affected. However, as the road will be private, the traffic effects are considered to be minimal.

To minimize potential effects to wetland habitats and species the following mitigation measure will be followed:

- Cease use of heavy machinery along the RoW from 8:00 PM to 6:00 AM daily during the peak anuran breeding period of April 15 to June 30

The potential effects of project construction and operation on amphibians are expected to be small, site-specific, short-term and insignificant.

6.2.5 Insects

As the tramway is situated in a significant wetland area, terrestrial invertebrates within the area will likely be those more reliant on the surrounding wetland habitats, such as terrestrial species with an aquatic juvenile stage. Macroinvertebrates have been found least responsive to human disturbance, relative to other wetland indicators (Brazner et al 2007), and macrobenthos populations have been found to recover to near normal levels within a year following disturbances such as drought (Bernard et al, 1982). No special mitigation measures will be required for terrestrial invertebrates.

The potential effects of project construction and operation on insects are expected to be small, site-specific, short term and insignificant.

6.3 SOCIO-ECONOMIC ENVIRONMENT

6.3.1 Economy

During clearing and construction, there is expected to be a modest increase in economic activity at Lac du Bonnet and/or Pinawa in terms of providing meals, materials and supplies to the construction site as well as providing accommodations for workers. Incidental purchases of repairs and parts for construction vehicles and equipment could also produce small economic benefits. Manitoba Hydro anticipates a construction crew of about 20 to 30 people. The work crews will not be staying in Pointe du Bois, and are expected to travel to the work site on a daily basis. Local employment and business opportunities associated with clearing and construction activities will include personnel of varying skill levels. Clearing and construction activities are expected to be conducted over a 1.5 year period.

Project effects on the local economy are considered to be localized and minor (related to positive effects) to insignificant (related to negative effects).

6.3.2 Property and Ownership

The proposed tramway conversion to an all-weather road will involve both the re-use of existing and creation of new RoW between Pointe du Bois and Slave Falls. The route is located on Crown land within the Whiteshell Provincial Park. There is one section near the starting point of the existing tramway at Pointe du Bois that is privately owned. Manitoba Hydro is continuing discussions with the landowner to acquire the property. Manitoba Hydro will obtain the required property rights from the Crown for the new portions of the right-of-way through a Crown land reservation.

Project effects on property ownership are considered to be insignificant.

6.3.3 Infrastructure and Services

Clearing and construction activities (i.e., movement of equipment, on-site workers, marshalling yard) could have a material effect on local community infrastructure and services at Pointe du Bois, such as water supply and sewage collection. The existing town site infrastructure at Pointe du Bois is expected to be able to handle the extra loads. The capacity of the water treatment/distribution and sewage-handling system is expected to meet construction needs.

Project effects on local town site infrastructure and services are expected to be site-specific, minor, short-term in nature, and insignificant.

As Manitoba Hydro hauls garbage off-site from Pointe du Bois, the garbage generated during the period of construction will be removed from the site for disposal as well. Project effects on off-site infrastructure and services related to garbage disposal are expected to be minor and regional in nature. No other material effects on community infrastructure and services outside of Pointe du Bois are expected.

Clearing and construction activity is expected to result in a very modest increase in traffic along PR 313 between Lac du Bonnet /Pinawa and the staging site at Pointe du Bois. Increased vehicular traffic may temporarily conflict with the recreational traffic using the same road to get to cottages or campground areas at Pointe du Bois during project mobilization. Vehicle construction traffic would be generated from a work crew anticipated to number about 20 to 30 people. All heavy equipment, including bulldozers, caterpillars, scrapers, etc., will be

transported to the work site once, stay in the work area during the duration of clearing and construction and then be transported out. Manitoba Hydro anticipates that some sand and gravel will be hauled on-site, but the number of trips is expected to be small, in the order of 10 to 15 loads.

The potential effects of construction activity on traffic are expected to be local, minor, short-term in nature, and insignificant.

Once constructed, traffic on the all-weather road is estimated to be 50 vehicles per day, consisting mostly of cars and light trucks. Most of the traffic would be Manitoba Hydro employees or those having authorized business at the Slave Falls Generating Station.

The potential effects with respect to operation traffic are expected to be local, minor, long-term in nature and insignificant.

6.3.4 Personal, Family and Community Life

Construction-related activities and operation and maintenance of an all-weather road can generally have some effect on communities and/or populations in close proximity. Potential effects during clearing and construction include public concern for the local environment (e.g., physical changes to the land), aesthetics, public safety and noise. Over the long-term, during the operation and maintenance stage, concerns can include potential effects on cottages and cabins, aesthetics, health and safety, air quality, noise, and changes to local ways of life and culture.

The discussion below includes an overview of potential project effects of the proposed road on cottages and cabins, aesthetics, health and safety, air quality, noise, culture and way of life, and community organization.

Cottages and Cabins

The proposed alignment of the all-weather road minimizes the effect on existing recreational cottages and a trapper's cabin. The route commences within the developed area of the Pointe du Bois townsite. From this point, the proposed route, to the extent possible, re-uses the existing tramway RoW or is located in close proximity to the existing tramway, so as to avoid passing close to any cottage locations. It is expected that there will be no net change in effects on existing cottages in the area from the conversion of the tramway to an all-weather road.

There is one trapper's cabin that is in the vicinity of a potential quarry site identified along the proposed route for the tramway conversion. During the period of clearing and construction, there is some potential for disturbance effects to the use of the cabin for trapping activities. The cabin site is located within approximately 300 m to the west of the proposed road RoW and 100 m distant from a potential quarry site. Given the location of the cabin, a buffer of trees will be maintained between it and the quarry site and associated road RoW. Once the road is operational, there will be intermittent disturbance effects to the cabin site over the long-term from traffic using the road between the two station sites.

Project effects on the cottages and cabin are considered to be minor and insignificant.

Aesthetics

Routing can help to minimize potential aesthetic effects in sensitive locations, like a Provincial Park. The starting point for the road is located within the developed portion of the Pointe du Bois townsite. The majority of the length of the proposed all-weather road will re-use or will be adjacent to an existing RoW and will not be in close proximity to cottages/residences. Therefore, it is expected that there will be no effects on direct sight lines or views from individual properties or sites. Application of Manitoba Hydro's general environmental protection practices will mitigate most potential effects related to aesthetic changes.

Project effects on aesthetics are considered to be insignificant.

Health and Safety

Concerns related to public health and safety (including worker safety) can arise during road clearing and construction activities and during subsequent operation and maintenance. Adherence to Manitoba Hydro's general environmental protection practices will mitigate any potential effects related to health and safety concerns. Appropriate protection measures include the use of information signs and the placement of warning markers to identify construction areas along the road RoW. Once the all-weather road is open and in use, appropriate road sign markings would be installed as required with respect to speed limits, wildlife warnings, and/or road conditions (e.g., icy roads, washouts, etc.).

Dust created by clearing and construction activities is not expected to have any potential effects on people. Water spraying to control dust is a common procedure that would be applied as required to alleviate potential problems throughout the spring, summer and fall construction

period. With the exception of the first kilometre of construction, the site is not located near inhabited areas, and it is not anticipated that area residents will experience project-related dust problems. Use of the trapper's cabin will occur during the October to May trapping season and given the distance between the site and the proposed road, effects from dust are not expected to be a concern. During road operation, water spraying will also be used in the spring, summer and fall months, for dust control.

Project effects on health and safety are considered to be insignificant.

Noise

RoW clearing and construction activities will involve the use of trucks and equipment (both rubber-tired and tracked vehicles), which can be a source of noise. Blasting of rock areas will also occur. Work hours are expected to be weekdays from 7 a.m. to 7 p.m., with some weekend work on occasion. Construction is expected to occur over the winter for RoW clearing/grubbing and installation of drainage works and would include some preliminary clearing and centerline surveying. Activities such as blasting, road construction, final grading, clean-up and restoration work are expected to occur in the spring/summer season, with removal of the tramway in the fall period. At any one time, noise is not expected to be a major concern given that project activities will be short-term in duration in any one location, some occurring during periods when few residents or resource users (i.e., traspper) would be present, and the buffer distance of cottages and cabins from the project site.

Noise from project activities is considered to be minor, short-term and insignificant.

Culture and Way of Life

Project activities are expected to be short-term in duration and the effects are considered to be minor (given the timing of activities and the location of the project in relation to individual properties) with no lasting effects on those enjoying a cottaging way of life. Manitoba Hydro will provide notification, in advance, to cottagers of scheduled clearing and construction activities.

All-weather road clearing and construction activities are not expected to adversely affect community life at Pointe du Bois or disturb the experience of adjacent cottagers in the use of their properties.

Beyond the minor disturbances during road clearing and construction activities, the proposed all-weather road operation may result in some longer-term effects on the local way of life.

Post construction access will continue over the long-term, with the primary use of the road by Manitoba Hydro. It is recognized that people in the area currently use the tramway RoW by accessing it from various points and that this use will likely not change with the new road.

With respect to concerns cottagers or recreational users may have regarding the potential for the all-weather road to infringe upon their sense of attachment and isolation to the area, Manitoba Hydro is committed to implement an access control system to minimize vehicle access on the road.

While the new road RoW may result in enhanced (albeit unauthorized) access for those who enjoy outdoor recreational activities, increased access is anticipated to be minimal and effects are considered to be insignificant.

Community Organization

Development of the road will not affect community organization either at Pointe du Bois or in the adjacent cottage area.

Community organization effects are considered to be insignificant.

6.3.5 Aboriginal Land & Resource Use

The proposed route will not affect or be located on any existing reserve lands or known treaty land entitlement (TLE) selections. The issue of historical utilization of resources along the Winnipeg River by Winnipeg Hydro and Manitoba Hydro without compensation to First Nations has been raised. Off-reserve Crown lands affected by the Project, and subject to traditional Aboriginal use, are typically within the jurisdiction of the Provincial government.

Project construction activities may temporarily disrupt any ongoing traditional or First Nation resource activities (i.e., trapping, hunting, berry-picking) in areas immediately adjacent to the road RoW; however, any effect would likely be short-term in nature. It is also anticipated that the operation of the proposed road would have no lasting effects on traditional activities or on those wishing to pursue traditional lifestyles. In fact, to the extent that these activities are already occurring in the area, the presence of the road may create additional opportunities.

Based on existing information, project effects on Aboriginal resource use are considered to be insignificant.

6.3.6 Commercial Resource Use

There is potential for project activities to impact commercial resource use between Pointe du Bois and Slave Falls. Potential impacts are associated with clearing activities for the road RoW and at limited areas for quarries and/or borrow pits developed for the road, including any access roads if required, and from the ongoing operation of the road. Disturbance can arise from direct impact on the resource or through undesired access to the resource by other parties. Positive effects can occur for a group when its access to the resource is improved.

Trapping

Clearing and construction of the RoW may cause a temporary disturbance to wildlife that will affect trapping on the west side of the Winnipeg River at Pointe du Bois down to Slave Falls. Blasting and the noise of heavy machinery could have an impact on trapping activity. These potential effects are site-specific, minor to moderate, and short-term in duration. Trappers known to use the area will be notified of the schedule for clearing and construction activities in advance.

During the operations, the new road RoW may benefit some trappers in the project area by improving access to their traplines. It is possible that the new access provided by the road RoW could lead to some additional resource harvesting or incidents of vandalism. Manitoba Hydro will implement a fenced and gated access control system to minimize use of the road.

Project effects on trapping are considered to be insignificant.

Lodges and Outfitters

Construction activities may also impact lodges and outfitters in the area, depending on when construction is occurring. Clearing and blasting activities could disturb wildlife (furbearers, game birds and big game animals) causing them to move further away, at least temporarily, thus affecting outfitter activity if previously part of an operating area. Lodge operators with specific outfitting allocation areas encompassing the location of the proposed route have been apprised of the project through the public consultation program, including meetings. Outfitters typically operate in large areas and may be able to modify operating areas or sites accordingly

during the construction period. Provision of notification on clearing and construction schedules to lodge operators or outfitters affected by these activities will help to mitigate potential effects.

Disturbance effects to commercial fishing specifically associated with lodge operations are also possible. As clearing and construction activities in any one area along the road RoW will be short-term in duration, the potential effects are considered minor.

Once the road is operational, concerns are possible with respect to either a perceived or real potential increase in traffic volumes and/or poaching in the area. Manitoba Hydro will implement an access control system to minimize use of the road.

Project effects on lodges and outfitters in the area are considered to be insignificant.

Forestry

There are currently no forestry operations (i.e., permits or timber sales) or any planned in the study area. As such, no associated effects are expected from the Project. Depending on the extent of clearing associated with the proposed RoW and any access roads to quarry and/or borrow pits, permits or a timber sale may be issued by Manitoba Conservation to conduct salvage operations.

Where economically feasible and practical, timber salvaged from the road RoW may present a business opportunity. Depending on the location of the timber and any company requirements regarding salvage (e.g., third party or quota holders), there could be some small additional revenues for third party or other quota holders to operate in the area. An additional positive effect from timber salvage could be the provision of firewood to individuals in the area.

Operation and maintenance of the all-weather road could result in small and generally positive economic benefits. Limited, short-term contracts for brush clearing to maintain the road RoW and winter road maintenance could be periodically available to qualified contractors in the local area.

Project effects on forestry are considered to be positive and insignificant.

Mining

There are no mineral claims or mineral leases in the vicinity of the project site; thus no effects are expected.

Project effects on mining are considered to be insignificant.

6.3.7 Recreational Resource Use and Tourism

Potential effects of an all-weather road on parks and recreational resources are generally associated with noise, visual and aesthetic effects and access.

Clearing and construction activities will result in a temporary disturbance, through noise and visual effects, of the 'natural' outdoor experience for park users (i.e., cottagers, campers, recreational hunters and fishers, and other day users) in the Pointe du Bois area. Most of these activities will occur in a limited area away from recreational use areas and will frequently occur when recreational users are absent (i.e., winter weekdays). Clearing and construction effects are therefore considered to be short-term, site-specific and minor in nature.

An additional potential effect on recreational users of the study area and adjacent areas, such as fishers on the Winnipeg River, is possible interference with travel to the project site from construction traffic. Since the heavy equipment will be transported in and out only once, this increased traffic will be due to the small construction work force driving in to the work site, normally at the beginning and end of each work day. Mitigation measures include prior notification of construction activities to recreational users and the placement of warning markers at the construction site. The potential effects are considered to be site-specific, minor and short-term in nature.

Potential effects on access and recreational use are possible, the extent of which is more uncertain. Participants in the public consultation process expressed mixed views regarding access to the proposed road: some participants felt that the road should be seen as an opportunity for more Manitobans to make use of the land for future cottage development and recreational use, while others felt that the road should remain private in order to prevent these uses. Nominally, access to the facility should remain unchanged and therefore effects will be insignificant. However, conversion of the tramway to a road surface would facilitate its use as a transportation route for recreational purposes (e.g., to reach hunting and fishing areas) and may be seen as a potentially improved opportunity to walk, cycle, snowmobile and quad, in an area where no formal trails exist. Manitoba Hydro is planning to control access to the road.

Project effects on recreational resource use and tourism are considered to be insignificant.

6.3.8 Heritage Resources

The construction phase of the Project has a higher potential for impacts on heritage resources than the operation phase. Potential impacts to heritage resources could result from RoW clearing for the road alignment, quarry and/or borrow pit excavations, construction of additional access roads (if required), and establishment of a marshalling yard. The range of mitigation measures for heritage sites includes site avoidance, preservation, landscaping and excavations. Avoidance is the preferred mitigation option. A heritage resource impact assessment has been undertaken along the tramway RoW to determine the presence of heritage resources prior to the start of any construction activity. This assessment allowed for mitigation (i.e., flagging and/or removal) of any newly discovered heritage sites potentially affected by the project.

The existing tramway corridor does not contain any known archaeological sites that could be impacted by the conversion of the existing tramway line to an all-weather road. If any new heritage resources are found during subsurface construction, the sites will be flagged and/or removed based on an assessment conducted by a qualified archaeologist. Assessment results will be reported to the Historic Resources Branch in fulfillment of the requirements of a heritage resource impact assessment. In the event that human remains are exposed, the RCMP and the Historic Resources Branch will be notified so that provincial procedures respecting human remains can be implemented.

Project effects on heritage resources are considered to be insignificant.

6.4 CUMULATIVE EFFECTS ASSESSMENT

Potential effects of existing and future expected projects in the area and associated activities were looked at with the view of assessing whether the effects of those projects and activities would have a cumulative effect on assessed project effects. The spatial boundary considered for the cumulative effects assessment was the geographic study area defined in section 1.2 of this EIS. A 75-year past temporal boundary was chosen to capture the existing operation of the Slave Falls and Pointe du Bois Generating Stations and the tramway between the two stations. The Slave Falls Generating Station and the tramway began operating in 1931. The Pointe du Bois Generating Station began operating in 1911. A specific future temporal boundary was not chosen; however, the boundary is reflected by the timeline of the future projects/activities as discussed below.

Existing Projects

Existing projects in the area are the Pointe du Bois and Slave Falls Generating Stations including the use of the existing tramway for access to Slave Falls Generating Station.

The existing operation of the Pointe du Bois and Slave Falls Generating Stations, including the use of the current tramway for access to Slave Falls, would not have any significant additional effects on project effects in the study area and thus there would be no cumulative effects associated with existing projects.

Potential New Projects

New Projects that are expected that are currently approved or in an approval process in the area include:

- The Pointe du Bois Modernization Project
- The Shand Cottage Subdivision
- Upgrade to PR 313
- Upgrade to the Transmission Lines between Pointe du Bois and Slave Falls

Pointe du Bois Modernization

Manitoba Hydro plans to rebuild the Pointe du Bois generating Station over a six year period beginning in 2010. The preferred clay and rock borrow sources for the Pointe du Bois Modernization is located in the Moose creek area. The rock borrow source is the same source that will be used for the Slave Falls road construction. The preferred borrow sources would be accessed by the Slave Falls road. Cumulative effects on rare plants as a result of accessing and using the borrow areas will likely occur but they cannot be quantified at the present time. In addition, significant truck traffic, estimated at an average of 250 trips per day for several months of each of the six construction years, on the Slave Falls road related to hauling borrow material would occur. The truck traffic will add to the road project effects on mammals and birds, air quality, climate change, and cottage way of life, but cannot be quantified at the present time. It is also noted that if the tramway is not converted to a road (at least as far as the Moose Creek borrow site) that the Pointe du Bois Modernization Project may then require road access in addition to the existing tramway or the location of the borrow areas may have to be revisited.

The environmental assessment for the Pointe du Bois Modernization Project, now underway, will quantify the effects related to use of the borrow sources.

Shand Cottage Subdivision

The Shand Cottage Subdivision will develop about 30 cottage lots to the south of Eight Foot Falls and east of the Slave Falls road over the next several years. The access road to the subdivision will run from the Eight Foot Falls area along the existing transmission line RoW. Development of the access road and the cottage lots will affect any rare plants in that area. Cumulative effects on rare plants will likely occur, but they cannot be quantified at the present time. The new cottage sub-division will also add to traffic in the area, but this additional effect is considered to be minor and insignificant.

PR 313 Upgrade

Upgrade to PR 313 from the junction of PR 315 to Pointe du Bois to support traffic associated with the Pointe du Bois Modernization Project is expected to be undertaken over the next couple of years. Cumulative effects related to rare plants along the roadway as a result of the construction are likely to occur, but they cannot be quantified at present. The road upgrade will also have potential additional effects on mammals and birds, but these additional effects are considered to be short-term, minor and insignificant. It is expected that an environmental assessment will be undertaken for the road upgrade and these effects will be quantified. Traffic effects related to Pointe du Bois modernization will be addressed in the Pointe du Bois Modernization environmental assessment.

Transmission Line Upgrade

Upgrade to the existing transmission lines between Pointe du Bois and Slave Falls is expected to be undertaken in the next several years. The transmission line runs through the project study area. Cumulative effects as a result of the construction activity for the upgrade related to rare plants in the transmission line RoW are likely to occur, but they cannot be quantified at present. The construction activity will also have potential additional effects on mammals and birds in the project area as well as cottage way of life, but these additional effects are considered to be minor, short-term and insignificant. The environmental assessment to be undertaken for the transmission line upgrade will quantify the effects.

Other Activities

In addition to project related cumulative effects, other activities with potential cumulative effects are related to maintenance and upgrade at Slave Falls Generating Station, increased general access and future development in the area.

Slave Fall GS Maintenance and Upgrade

Continued maintenance and upgrade at the Slave Falls Generating Station are planned over the next ten years. Access to the station will be via the Slave Falls road. Cumulative effects will not occur.

Increased General Access

The presence of the new road may have the potential for encouraging additional general access to the study area, with resulting cumulative effects within the project study area. As the road access will be restricted, the cumulative effects are considered to be insignificant as a result of the increased general access.

Increased Development

The presence of the new road could stimulate other developments (e.g. cottages, campgrounds, forestry, etc.) that may create further disturbance to the environment in the project area and beyond. The location of the project within a Provincial Park may also introduce pressure, either from recreation users or the provincial government, to increase access to the area and/or develop new recreational opportunities. These other undefined developments could result in cumulative effects in the area, but they cannot be quantified at the present time. Presumably, new developments would be subject to an environmental approval process where the effects could be quantified and mitigation measures identified.

Mitigation of Cumulative Effects

As a component of the approval process, mitigation approaches/measures will be developed for present and future projects/activities that Manitoba Hydro has control over or involvement in. These projects include the existing Pointe du Bois and Slave Falls Generating Stations, the Pointe du Bois Modernization Project, the improvements to PR 313, on-going maintenance and upgrade at Slave Falls Generating Station, and the transmission line upgrade.

Similar mitigation approaches/measures are encouraged for other future developments in the project area.

Following implementation of appropriate mitigation measures for all present and future projects/activities in the project area overall cumulative effects should be insignificant.

7.0 MONITORING AND FOLLOW-UP

7.1 ENVIRONMENTAL PROTECTION AND MONITORING APPROACH

General standard environmental protection measures that are intended to mitigate or prevent potential environmental effects and will be followed during the clearing and construction activities associated with proposed project can be found in Appendix F. Prior to initiating clearing and construction activities, an Environmental Protection Plan (EnvPP) will be developed for the Slave Falls Tramway Project, which will outline and commit Manitoba Hydro to an environmental protection and monitoring program extending through the construction, operation and maintenance phases of the project. Any eventual decommissioning of the project will adhere to applicable legislation and regulations at the time of abandonment and, if appropriate, will subject to the preparation of an EnvPP at that time.

With respect to construction, operation and maintenance activities, the project specific EnvPP will encompass the following:

- Facilitate the mitigation of environmental effects throughout the full-life cycle of the project by providing construction and maintenance personnel with clear instructions on mitigation measures to be implemented, and on the appropriate lines of communication and means of reporting to be followed
- Incorporate any issues and concerns identified during the consultation process
- Identify modifications to construction methods or schedules, summarize environmental sensitivities and mitigative actions, list emergency response plans and reporting protocols, and describe a plan for the borrow pits including mitigation of potential hazards to public safety

- Provide specific information on waste management practices to be utilized during the construction phase of the Project, including all liquid and solid wastes generated
- Monitor clearing and construction practices to ensure that the work proceeds in accordance with the EnvPP

7.2 ENVIRONMENTAL PROTECTION AND MONITORING PLAN

The EnvPP for the Project will be implemented to:

- Protect the environment
- Exercise due diligence in carrying out project activities
- Evaluate the effectiveness of measures used to prevent or minimize environmental effects

The following monitoring programs will be implemented:

- Compliance monitoring
- Pre-construction monitoring

7.2.1 Compliance Monitoring

An environmental compliance monitoring program will ensure that commitments made to regulatory authorities and others in the EIS are implemented through all phases of project development.

The environmental protection workers assigned to implement the program will be familiar with all applicable legislation, regulations and guidelines, as well as the EIS and EnvPP, and any related license conditions. Monitoring will ensure that activities do not contravene the legislation, regulations and guidelines, and commitments made in the EIS and EnvPP. In the event of any non-compliance, environmental protection workers will immediately report the incident to the Construction Supervisor, and implement measures to achieve compliance.

Monitoring during the operation and maintenance phases of the Project should be conducted by routine ground surveys. These surveys will include a visual inspection of environmental conditions. For example, the condition of the Moose Creek crossings will be examined and any

potential project effects such as soil erosion or contamination will be identified. If a problem has been identified, mitigation measures will be undertaken immediately (e.g., to stabilize eroding soils).

7.2.2 Pre-construction Monitoring

Some pre-construction monitoring will be undertaken in order to assist in developing mitigation strategies to avoid environmental site-specific impacts during the construction phase of the Project. Pre-construction monitoring will include:

- A rare plant survey will be conducted along the proposed road alignment that was not surveyed in 2007 and in areas where borrow sources are to be developed for the proposed project
- A heritage resources survey will be conducted in areas along the tramway that were not investigated during the initial assessment in 2007 (i.e. borrow source locations)
- Site inspection of the proposed RoW prior to clearing and construction activities to determine presence/absence of existing nesting or denning sites.

Information collected during the monitoring noted above, and measures for mitigation, will be specified in the project EnvPP.

8.0 REFERENCES

Physical Environment

Earth Tech (Canada) Inc. 2007. *Manitoba Hydro Slave Falls Access Study*. Prepared for Manitoba Hydro.

Environment Canada. 2007. *Canadian Climate Normals, 1971-2000*. http://www,climate.weatheroffice.ec.gc.ca

Manitoba Energy and Mines. 1987. *Bedrock Geology Compilation Map Series, Preliminary* Edition*, Pointe du Bois.* NTS 52L, 1:250 000scale.

Matile, G.L.D. and G.R., Keller. 2004. *Surficial Geology of the Pointe du Bois Map Sheet (NTS 52L), Manitoba.* Manitoba Industry, Economic Development and Mines, Manitoba Geological Survey, Surficial Geology Compilation Map Series, SG-52L, Scale 1:250 000.

Poston, B., D.M. Ealey, P.S. Taylor, and G.B. McKeating. 1990. *Priority Migratory Bird* Habitats *of Canada's Prairie Provinces*. Habitat Conservation Section, Canadian Wildlife Service. Environment Canada. Edmonton, Alberta.

Rutulis, M. 1986a. *Aquifer Maps of Southern Manitoba Map 1 of 2 Sand and Gravel Aquifers.* Department of Water Resources, Water Resources Branch. Winnipeg, Manitoba.

Rutulis, M. 1996b. *Aquifer Maps of Southern Manitoba Map 2 of 2 Bedrock Aquifers.* Department of Water Resources, Water Resources Branch. Winnipeg, Manitoba.

Rutulis, M. 1986c. *Aquifer Pollution Hazard Areas in Southern Manitoba.* Department of Water Resources, Water Resources Branch. Winnipeg, Manitoba.

Smith, R.E., H. Veldhuis, G.F. Mills, R.G. Eilers, WR. Fraser, and G.W. Lelyk. 1998. *Terrestrial* Ecozones*, Ecoregions and Ecodistricts of Manitoba. An Ecological Stratification of Manitoba's Natural Landscapes*. Technical Bulletin 98-9E. Land Resource Unit, Brandon Research Centre, Research Branch, Agriculture and Agri-Food Canada, Winnipeg, Manitoba. Report and map at 1:1 500 000 scale.

Soils Classification Working Group. 1998. *The Canadian System of Soil Classification, 3rd ed.* Agriculture and Agri-Food Canada Publication 1646, 187 pp.

Strong, W.L. (compiler). 1996. *Pre-harvest Ecological Assessment Handbook, Alta.* Environ. Prot., Environ, Training Centre, Hinton, Alta. Publ. No. Ref. 96.

Unies Ltd. 2006. *Drainage Design Report.* Prepared for Earth Tech (Canada) Inc. for inclusion into the Manitoba Hydro Slave Falls Access Study Report.

Winnipeg River. 2007. Wikipedia Encyclopedia. http://www.wikipedia.org.

Aquatics

Stewart, K. W. and D. A. Watkinson. *The freshwater fishes of Manitoba*. University of Manitoba Press.

Habitat and Ecosystems

Crescent Botanical Services. 2007. *Plant survey of the proposed conversion of tramway to private all-weather road, Pointe Du Bois to Slave Falls, Manitoba.*

ECOSTEM. 2008. *Habitat characterization for the proposed Slave Falls tramway to road conversion project.*

Ehnes, J. W. 1998. *The influences of site conditions, age and disturbance by wildfire or winter logging on the species composition of naturally regenerating boreal plant communities and some implications for implications for community resilience.* Ph. D. thesis, University of Manitoba, Winnipeg.

Manitoba Conservation. 2002. *Manitoba Ecosystem Based Management Pilot Project: Science Team Report. Ecoregion 90: Lac Seul Upland Ecoregion Summary Technical Report.* Province of Manitoba.

Mammals

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Accessed March 2007. Database and Listing: http://www.cosewic.gc.ca/eng/sct5/index_e.cfm.

Godfrey 1986. *The Birds of Canada.* National Museum of Canada bulletin no 203, biological series No. 73

Ecostem Ltd. 2007. *Unpublished preliminary habitat classification mapping provided to North/South Consultants Inc. in April 2007.*

Eastern Manitoba Woodland Caribou Advisory Committee (EMWCAC). 2005. *An Integrated Strategy for the Owl Lake Boreal Caribou Herd*. An update of the original 1995 Owl Lake Strategy. Committee Report

Manitoba Endangered Species Act (MESA). Accessed March 2007. Database and listing:http://www.gov.mb.ca/conservation/wildlife/managing/species_at_risk.html.

Manitoba Avian Research Committee 2003. *The Birds of Manitoba.* Manitoba Naturalist Society Avian Research Committee.

Schindler, D.W. 1993. *Moose Census and Habitat Evaluation for the Manitoba Model Forest.* March 8. A technical report prepared for the Manitoba Model Forest.

Schindler, D.W. 1991. *A Moose Census, Population Analysis and Management Recommendation for Game Hunting Area 36, Including Whiteshell Provincial Park.* November 1. Wildlife Manuscript Report 91-19

Schindler, D.W. 1986. *Population Aerial and Age and Sex Data, Whiteshell Provincial Park.* March 1. Wildlife Manuscript #87-21.

Schindler, D.W. 1986. *Moose Population Estimate and Age and Sex Survey for Manitoba's Game Hunting Area 26.* March 1. DNR Wildlife Manuscript 87-22.

Schindler, D.W. 1985. *Game Hunting Area 36 Estimate Age and Sex Moose Survey,* Winter 1985, DNR Wildlife Technical Document, February 25.

Schindler, D.W., D. Walker and T. Davis 2007. *The effects of linear features on functional habitat, animal energetics and range fragmentation for woodland caribou in Eastern Manitoba (Journal Rangifer)*

Schindler, D.W 2006. *Home range and core area determination, habitat use and sensory effects of all weather access on boreal woodland caribou (Rangifer tarandus caribou) in eastern Manitoba.* A Thesis Submitted to the Faculty of Graduate Studies in Partial Fulfillment of the Requirements for the Degree of Master of Environment.

Species at Risk Act. Accessed November 2007. Database and Listing: http://www.speciesatrisk.gc.ca/default_e.cfm

Amphibians and Reptiles

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Accessed March 2007. Database and Listing: http://www.cosewic.gc.ca/eng/sct5/index_e.cfm.

Ecostem Ltd. 2007. *Unpublished preliminary habitat classification mapping provided to North/South Consultants Inc. in April 2007.*

Integrated Taxonomic Information System (IT IS). Accessed March 2007. Taxonomic Listings: http://www.it is.gov.

Kendell, K. 2002. *Survey protocol for the northern leopard frog.* Alberta Species at Risk Report 43, Fish & Wildlife Division.

Manitoba Endangered Species Act (MBESA). Accessed March 2007. Database and Listing: http://www.gov.mb.ca/conservation/wildlife/managing/species_at_risk.html.

Preston, W. 1982. *The amphibians and reptiles of Manitoba.* Manitoba Museum of Man and Nature, Winnipeg, Manitoba.

Seale, D.B. 1982. *Physical factors influencing oviposition by the wood frog, Rana sylvatica, in Pennsylvania.* Copeia 1982(3): 627-635.

Species at Risk Act. Accessed November 2007. Database and Listing. http://www.speciesatrisk.gc.ca/default.

Insects

Bernard, J.G., C.J. Edwards, and L.C. Woods III. 1982. *Recolonization of macroinvertebrates and fish in a channelized stream after a drought.* Ohio Journal of Science. 82(3):96-102.

Biological Survey of Canada, Terrestrial Arthropods. Accessed November 2007. http://www.biology/ualberta.ca/bsc/briefs/brinsectsofcane.htm.

Brazner, J.C., N.P. Danz, G.J. Niemi, R.R. Regal, A.S. Trebitz, R.W. Howe, J.M. Hanowski, L.B. Johnson, J.J.H. Ciborowski, C.A. Johnston, E.D. reavie, V.J. Brady, and G.V. Sgro. 2007. *Evaluation of geographic, geomorphic and human influences on Great Lakes, wetland indicators: A multi-assemblage approach*. Ecological Applications. 7(2007):610-635.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Accessed March 2007. Database and Listing: http://www.cosewic.gc.ca/eng/sct5index_e.cfm.

Danks, H.V. and R.G. Foottit. 1989. *Insects of the boreal zone of Canada.* The Canadian Entomologist. 121(8):625-690.

Kovats, Z.E., J.H. Ciborowski, and L.D. Corkum. 1996. *Inland dispersal of adult aquatic insects.* Freshwater Biology. 36:265-276.

Manitoba Endangered Species Act (MBESA). Accessed March 2007. Database and mapping listing: http://www.gov.mb.ca/conservation/wildlife/managing/species_at_risk.html.

Petersen, H. and M. Luxton. 1982. *A comparative analysis of soil fauna populations and their role in decomposition processes.* Oikos. 39:287-388.

Socio-Economics

Department of Mines and Natural Resources. 1986. *Whiteshell Registered Trapline, RTL 51 (Provisional), Province of Manitoba*. Wildlife Branch, Winnipeg.

Department of Natural Resources. 1983. *Whiteshell Master Plan.* Parks Branch, Winnipeg.

Manitoba Conservation. 2006. *Manitoba Hunting Guide*. Winnipeg.

Manitoba Conservation. 2007. *Interdepartmental Operational Crown Land Plans Report*. Crown Lands ADM Committee. Sustainable Resource and Policy Management Branch, Winnipeg.

Manitoba Conservation. 2000. *Whiteshell Provincial Park Map (1:125,000)*. Land Information Division, Winnipeg.

Manitoba Energy and Mines. 1988. *Aggregate Resources Compilation Map Series, Map AR88-1-5, Pointe du Bois, NTS 52L, 1:250,000*. Winnipeg.

Manitoba Hydro. *Winnipeg Hydro Reflections 1911 to 2002*. ISBN 0-9690482-4-6. Winnipeg.

Manitoba Industry, Trade and Mines. 2001. *Mineral Disposition and Quarry Lease Compilation, NTS 52L, Pointe du Bois (1:250,000)*. Mines Branch, Winnipeg.

Manitoba Natural Resources. 1996. *System Plan Summary - Manitoba Provincial Parks*. Parks and Natural Areas Branch, Winnipeg.

Statistics Canada. 2007. *2006 Community Profiles*. Statistics Canada Catalogue no. 92-591-XWE.

Statistics Canada. 2002. *2001 Community Profiles*. Statistics Canada Catalogue no. 93F0053XIE.

Travel Manitoba. *2006 Fishing & Hunting Adventures Guide*. Winnipeg.

Winnipeg River Planning District. 1986. *Background Report to the Winnipeg River* Planning District Development Plan. Department of Municipal Affairs, Municipal Planning Branch. Winnipeg.

Winnipeg River Planning District. *Winnipeg River Planning District Development Plan By-Law No. 14-90.* Winnipeg River Planning District Board.

Alex Warga, Special Projects Officer, Property Department, Manitoba Hydro. E-mail correspondence, August 31, 2007.

Daniel Beaupre, TLE Coordinator, Property Department, Manitoba Hydro. E-mail correspondence, September 11, 2007.

Garth Ferguson, Superintendent, Pointe du Bois G.S., Manitoba Hydro, Pers. Comm., December 2007.

Heritage Resources

Buchner, A. P. 1982. *An Archaeological Survey of the Winnipeg River. Manitoba cultural Affairs and Historical Resources, Historic Resources Branch,* Papers in Manitoba Archaeology, Final Report #12.

Historic Resources Branch (HRB), Manitoba Culture, Heritage and Tourism

n.d. Manitoba Archaeological Sites Database.

Northern Lights Heritage Services Inc. 2007a. *Pointe du Bois Modernization Project: Archaeological Survey Component*. Prepared for Manitoba Hydro.

Northern Lights Heritage Services Inc. 2007b. *Slave Falls Tramway Conversion Project;* Archaeological *Field Investigations Component*. Prepared for Manitoba Hydro.

Northern Lights Heritage Services Inc. 2007c. *"Field Notes for the Slave Falls Tramway, June 20 - June 21, 2007".* Unpublished data on file with Northern Lights Heritage Services Inc. and Quaternary Consultants Ltd.

Quaternary Consultants Ltd. 2006 *Cultural Resource Assessment for the Proposed Conversion of the Pointe du Bois/Slave Falls Tramway into an All-weather Road*. On file with Earth Tech Canada Inc. and Historic Resources Branch.

Steinbring, Jack. 1980. *An Introduction to Archaeology on the Winnipeg River.* Manitoba Cultural Affairs and Historical Resources, Historic Resources Branch, Papers in Manitoba Archaeology, Miscellaneous Paper #9.