SUBJECT AREA: **Agriculture, Soil Compaction**

REFERENCE: **CEC MMTP Round 1 IRs**

QUESTION:

Section 15.4.2.1 presents soil compaction risk in Table 15.8 in terms of hectares and proportional extent within existing and new ROW and at Glenboro South Station. There appeared to be consideration for certain soil types that may pose a higher risk.
Can Manitoba Hydro provide an overview as to how it classified soils types or lands with respect to risk?

RESPONSE:

The methods used to conduct soil classifications for compaction risk are presented in Section 15.3.2.1.3 (p. 15-21). Compaction risk was determined for the project development area (PDA) and local assessment area (LAA) based on soil texture and drainage properties provided in the Manitoba Land Initiative (MLI 2014) soil databases.

To assist in review, the relevant methods section is excerpted below:

Compaction risk for soils within the PDA and LAA was determined based on soil texture and drainage properties provided in the MLI (2014) soils database (Table 15-2). A generalized rating system for compaction risk was developed using professional judgment and review of two compaction systems that had been designed for forestry applications; specifically the Soil Compaction and Puddling Hazard Key (British Columbia Ministry of Forests 1999) and the table of Compaction and Rutting Hazard for Soils in Ontario (Archibald et al. 1997). While the MLI soils database covers the whole RAA, the availability of the data at different scales, ranging from detailed (large scale; typically 1:20,000; local land planning) to reconnaissance (small scale; typically 1:126,000; regional land planning) (Coen 1987), was a limitation to this assessment. Small-scale maps provide less detail in terms of the spatial distribution of soils. However, they provide information on the dominant soil types and their physical properties,

enabling interpretation and calculation of a compaction risk rating that is representative of the dominant conditions on the ground. Therefore, despite larger polygon delineations (areas) in the areas with small-scale data, the confidence in the estimate of compaction risk is still high.

Table 15-2 Compaction Risk Matrix

Drainage	Textural Class					
	Very Coarse (S, LS, LFS)	**Moderately Coarse (SL, FSL)**	**Medium (VFSL, L, SiL)**	**Moderately Fine (SCL, CL, SiCL, Si)**	**Fine/Very Fine (SC, SiC, C, HC)**	**Organic**
Rapid	Low	Low	-	-	-	-
Well	Low	Low	Low	Moderate	Moderate	-
Imperfect	Low	Low	Moderate	High	High	-
Poor	Moderate	Moderate	High	High	High	-
Very Poor	-	-	-	-	-	High

NOTES:

S = sand	LS = loamy sand	LFS = loamy fine sand	SL = sandy loamy
FSL = fine sandy loam	VFSL = very fine sandy loam	L = loam	SiL = silt loam
SCL = sandy clay loam	CL = clay loam	SiCL = silty clay loam	Si = silt
SC = sandy clay	SiC = silty clay	C = clay	HC = heavy clay

SOURCE: Matrix developed using professional judgment and review of two compaction systems (Archibald *et al.* 1997; British Columbia Ministry of Forests 1999)

References:

Archibald, D.J., W.B. Wiltshire, D.M. Morris, and B.D. Batchelor. 1997. Forest management guidelines for the protection of the physical environment. Version 1. Report MNR #51032. Ontario Ministry of Natural Resources. Queen's Printer for Ontario, Toronto, ON.

British Columbia Ministry of Forests. 1999. Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook. 2nd Edition. Version 2.1. For. Prac. Br., B.C. Min. For., Victoria, British Columbia.

Coen, G.M. (ed.). 1987. Soil survey handbook. Volume 1. Technical Bulletin 1987-9E. Research Branch, Agriculture Canada. Available from http://sis.agr.gc.ca/cansis/publications/manuals/1987-9/1987-9-soil-survey-handbook.pdf [accessed 4 February 2015].

MLI (Manitoba Land Initiative). 2014. Manitoba Agricultural Interpretation Database (SoilAID). Available at: http://mli2.gov.mb.ca/. Accessed: May 2014.

SUBJECT AREA: **Agriculture, None**

REFERENCE: **CEC MMTP Round 1 IRs - Part 1**

QUESTION:

In terms of biosecurity, general mitigation measures are noted (bullets on p. 15-75). An additional bullet should be added that includes undertaking soil sampling to identify previously affected fields (e.g. those already affected by Soybean cyst nematode). This can provide a general baseline should fields become affected at a later date. Will this be considered?

RESPONSE:

General mitigation related to biosecurity risks on croplands during the construction phase of the Project are presented in Section 15.5.3.1.1 on p. 15-75. Specifically, these measures are to be implemented to reduce soil transport, and associated pests, between fields and address the mechanism of transmission of soil-borne pests between fields traversed by the Project.

Clubroot is the only soil-borne pathogen asked by stakeholders to be sampled by Manitoba Hydro and there are no plans to sample for SCN on the Project. As clubroot is known to exist within the RAA, sampling will be carried out prior to Project construction on all cultivated fields intersected by the ROW. Sampling will be conducted with landowner permission. Project concerns related to soybean cyst nematode (SCN) have not been expressed to Manitoba Hydro by stakeholders. However, Manitoba Hydro will consult with Manitoba Agriculture prior to beginning the sampling process to ensure that the sampling plan covers pathogens which are a concern in the area.

Manitoba Hydro, and its contractors, will follow the current version of the Agricultural Biosecurity Standard Operating Procedures (including considering implementation of measures not previously identified to address operation-specific biosecurity issues (see Section 5. General Considerations):

"If existing farm level biosecurity measures exist, Transmission staff and contractors will strive to meet the requirements of the agricultural operation when access is required."

Manitoba Hydro employs an adaptive management approach to its biosecurity program and undertakes ongoing engagement with a variety of agricultural stakeholders to address concerns as they arise.

SUBJECT AREA: **Agriculture, None**

REFERENCE: **CEC MMTP Round 1 IRs - Part 1**

QUESTION:

In the summary of existing conditions, it is noted that there are 19 unclassified livestock operations. This appears to contradict the information provided in Table 15-14 and Section 15.4.4.5. Should this not read as 24 operations (5 in SLTC, 3 in RVTC and 16 in New ROW). If this is not the case this should be explained more clearly.

RESPONSE:

The 24 unclassified livestock operations within the LAA presented in Table 15-14 and in Section 15.4.4.5 consist of 5 in SLTC, 3 in RVTC and 16 in New ROW. The 19 unclassified livestock operations referred to in the summary section 15.4.6 (p. 15-53) represents those operations in RVTC (3) and New ROW (16) and do not include the 5 within SLTC.

SUBJECT AREA: **Human Health Risk, None**

REFERENCE: **CEC MMTP Round 1 IRs - Part 1**

QUESTION:

Chapter 18 assesses effects on air quality. Some construction mitigation measures are identified, although this appeared to be a short list of effects and mitigation. Potential air emissions from spoils piles, stockpiling of materials and dust on roads would appear to be potential effects and no mitigation measures were identified for these types of effects. Is this described elsewhere in the EIS? Can these types of effects be addressed later in the EPP?

RESPONSE:

In planning for dust-management, Manitoba Hydro draws upon previous transmission-line construction experience. Mitigation measures have been developed to manage dust according to activities typically considered at risk (traffic on roads) and are focused in areas in proximity to public activities; however, it is also Manitoba Hydro's intent to be responsive and apply dust control measures as required throughout construction (see page 2-46 of the Project Description). The implementation of additional dust mitigation measure could include application to topsoil, aggregate, and fill piles.

Due to the pace and linear nature of transmission line construction, and with limited spoils piles and stockpiling of materials expected for this project, Manitoba Hydro does not believe a specific Dust Management Plan is warranted. Manitoba Hydro believes meeting the intent of such a plan is achieved through daily site preparation meetings and responsiveness to on-site conditions being monitored by Manitoba Hydro Environmental Inspectors.

SUBJECT AREA: **Infrastructure and Services, None**

REFERENCE: **CEC MMTP Round 1 IRs - Part 1**

QUESTION:

With respect to health infrastructure services, the mobile camp is expected to employ a mobile clinic which should address the vast majority of health concerns associated with the workforce. But can Manitoba Hydro better explain the various health related concerns the mobile clinic can handle during construction?

RESPONSE:

"A recent addition to the Health Authority's primary care service delivery is a mobile clinic that travels around Stuartburn and Piney. Staffed by a Nurse Practitioner and Registered Nurse, the clinic provides primary care to residents who are less mobile" (page 19-35). As noted in section 19.5.6.2 of the EIS, Manitoba Hydro will "liaise with the Southern Health RHA about the possibility of coordinating primary care services with the mobile clinic around Stuartburn and Piney" (page 19-56). These discussions will occur prior to construction commencing. A Nurse Practitioner may be able to provide the following services:

- Treatment evaluation, minor medical procedures, disease management
- Referrals for specialized medical care, diagnostic testing, physical/occupational therapy
- Prescribing drugs for acute and chronic illnesses
- Obtaining patient histories, physical examinations, disease diagnosis
- Counselling and education on health behaviours, self-care, and treatment options

Reference:

https://www.crnm.mb.ca/about/registered-nursing/registered-nurse-authorized-prescriber

SUBJECT AREA: **Traditional Land and Resource Use, Heritage Resources**

REFERENCE: **CEC MMTP Round 1 IRs**

QUESTION:

In Chapter 11 it was indicated that a number of the TK studies were not completed prior to the completion of the EIS.

In Chapter 12 it was indicated that there were areas of high archaeological potential that would still require field assessment.

What happens in a situation where significant traditional or archaeological resources are discovered in the PDA and there is a desire on the part of a First Nation or First Nations to leave these resources as is. Could such areas be left intact? If so how would you do that?

If during construction, archaeological resources or Aboriginal heritage resources are discovered, what is the protocol for work at the specific sites and further assessments?

RESPONSE:

If cultural or heritage resources are discovered in the PDA, and there is a desire on the part of a First Nation, First Nations, or the Manitoba Metis Federation to leave these resources in place, Manitoba Hydro will work with the Historic Resources Branch (HRB) to develop a mitigation plan. For heritage resources as defined under *The Heritage Resources Act*, HRB is the authority that determines how and what mitigation measures are to be applied. Whether the area could be left intact depends on the type and extent of the find(s), as each find requires unique mitigation measures. Mitigation measures can include buffering an area for hand clearing or removal of cultural or heritage resources through excavation. Communities will be notified of any find(s) and if sacred or ceremonial objects are found, Community Representative(s) may arrange for and facilitate an appropriate ceremony. Additional consideration is whether the find is located on Crown or private lands. On private lands, Manitoba Hydro also works with the landowner to discuss mitigation measures.

If Manitoba Hydro, its contractors and/or consultants, discover or accidentally disturb a cultural or heritage resource, Manitoba Hydro will follow processes outlined in the Cultural and Heritage Resources Protection Plan. The use of a CHRPP is a practical and direct implementation of Manitoba Hydro's environmental policy and its commitment to responsible environmental and social stewardship. It is a proactive approach to effectively manage potential discoveries of human remains, and cultural and heritage resources. Project workers including contractors, environmental inspectors and monitors are required to be aware of what is outlined in the CHRPP and are trained in cultural and heritage resource identification and key actions in the case of accidental discoveries. The CHRPP includes results from the shared Traditional Knowledge (TK) reports, as well as a protocol that invites community involvement and provides the opportunity for new information on cultural or heritage sites to be included in the monitoring program and Construction and Environmental Protection Plans (CEnvPPs).

Ongoing protection measures such as implementation of a heritage resource impact monitoring (HRIM) field work program will continue the assessment of areas of high heritage potential over the course of clearing and construction activities. The HRIM will follow an adaptive management approach and will include First Nation and Metis knowledge regarding cultural and heritage resources. In addition, First Nation and Metis will have the opportunity for direct involvement in the HRIM field investigations to share results and processes with their respective communities.

SUBJECT AREA: Heritage Resources, Heritage Resources

REFERENCE: CEC MMTP Round 1 IRs - Part 1

QUESTION:

Please explain if and how Aboriginal Heritage Resources were incorporated in to the Heritage Resources assessment? Or were these just dealt with under Traditional Land and Resource Use?

RESPONSE:

Aboriginal Heritage Resources were incorporated into the Heritage Resources assessment (Chapter 12). A robust methodological approach that considered Heritage Resources was undertaken for route selection and the subsequent heritage resource assessment of the preferred route. The location of known heritage resources, including previously recorded archaeological sites pertaining to Aboriginal, or First Nation, and Metis Heritage Resources, was obtained from the Historic Resources Branch of Manitoba Sport, Culture, and Heritage. Alternative routes, the preferred route, and the Final Preferred Route were analyzed for proximity to these known heritage resources and to potential heritage resource locations as derived from predictive modelling. The predictive modelling approach taken for the MMTP heritage resource assessment identified proxy variables that included proximity to water, topography, soil type, proximity to known archaeological sites, past land use, and proximity to historical features such as trails.

SUBJECT AREA: **Routing, None**

REFERENCE: **CEC MMTP Round 1 IRs - Part 1**

QUESTION:

In Chapter 13 a key point emphasized is that the proposed MMTP should generally be paralleled to compatible linear infrastructure such as other transmission lines but also to avoid non-compatible infrastructure. One type of non-compatible linear infrastructure is hydrocarbon pipelines. An issue about this and question for Manitoba Hydro is identified below. In Table 13-1, it is indicated that: "The route should avoid paralleling oil and gas pipelines and reduce pipeline crossings." However, the response text indicated that: "The Final Preferred Route traverses and parallels existing pipelines and effects on pipeline infrastructure are included in the assessment (Section 13.5.5)." Can Manitoba Hydro explain what it was trying to say here?

Table 13-15 identifies the list of transportation and utility infrastructure crossed or paralleled by MMTP. There is also a third column that indicates, "average distance". Is this meant to be separation distance?

Table 13-15 identifies the list of transportation and utility infrastructure crossed or paralleled by MMTP. We understand that it is a safety measure to avoid paralleling hydrocarbon pipelines. The table indicates that approximately 3km of the TransCanada pipeline is paralleled by MMTP at a distance of 100M. What is considered the safe distance? Are there any guidance documents that Manitoba Hydro followed with respect to the issue of transmission siting and hydrocarbon pipelines? Are there also safety concerns with respect to proximity of MMTP to landfill sites and sewage lagoons.?

RESPONSE:

1. Paralleling hydro carbon pipelines presents a land use opportunity and a technical electrical mitigation challenge.

Paralleling linear infrastructure including pipeline right of ways is often viewed as an opportunity to group similar linear land uses thereby potentially reducing impacts (ie reduce access requirements or clearing). However, depending on the technical challenges with the specific facilities, there may be additional impacts and considerations in comparison to other more compatible linear developments. The impacts to the pipeline are most commonly associated with electrical induction on the pipeline and the cathodic protection requirements.

The compatibility of a paralleling pipeline is dependent on several factors including the length of the parallel, the voltage and capacity of the powerline, the width of the separation, the type, size and coating of the pipeline, existing grounding or protection measures and the product in the pipeline.

The result is that pipeline parallels are often a site specific assessment on the compatibility based on the potential to address or mitigate induction issues. When mitigation is impractical or not possible pipeline parallels represent a non-compatible linear infrastructure. In the absence of a site specific assessment, pipelines are generally considered to be non-compatible based on the potential to negatively affect the integrity of the pipeline.

2. Yes, average distance as it refers to the third column refers to general separation distance.
3. There are two scenarios to be considered when powerline is paralleling with pipeline. One is steady state loading condition of powerline and the other is fault condition of powerline. Under steady state loading condition, both inductive and capacitive interference exist. However, under fault condition, on top of inductive and capacitive interference, conductive interference also exists which is usually the dominant factor and hard to mitigate. The zone of influence of conductive interference is relatively small and usually less than 100m from faulted location. As a result of the factors listed above the MH project team determined that a general set-back of 100 m avoids the majority

of risks associated with paralleling a major pipeline, while still applying the principle of paralleling, albeit to a lesser degree.

4. For the 3km parallel section of TransCanada pipeline with MMTP, currently, MH is working with TransCanada to mitigate any potential operation or safety hazard due to electric and magnitude interference of powerline. The definition of a “safe distance” is dependent on a variety of considerations, including collaborative discussions with the facility owner and associated regulatory agencies.
5. CSA C22.3 No.6-13. Minimal 10m separation distance is required between powerline and paralleled pipeline.
6. During normal operating conditions there are no safety concerns with respect to proximity to landfills or sewage lagoons.

SUBJECT AREA: **Employment and Economy, None**

REFERENCE: **CEC MMTP Round 1 IRs**

QUESTION:

Can Manitoba Hydro summarize what efforts are being made to increase Aboriginal employment and economic opportunities associated with the MMTP Project? Please include more general opportunities it provides in the way of Aboriginal employment and economic opportunities that may be applicable to MMTP.

RESPONSE:

Tenders will contain a combination of mandated requirements and incentives to drive Indigenous content. Clear expectations of contractors related to Indigenous communication and involvement will be outlined in the tenders and subsequent contracts. Tenders will have clear criteria for evaluation which will directly incorporate Indigenous content. Contracts will contain financial consequences related to vendor not fulfilling Indigenous content as proposed.

Indigenous content may include employment, subcontracting, and rentals and services. Targets will be determined based on the type and scope of work within the specified contracts. Contact information for communities, local hiring sessions, and hiring preference will form part of the tenders to encourage Indigenous content.

SUBJECT AREA: **Agriculture, Routing**

REFERENCE: **CEC MMTP Round 1 IRs - Part 1**

QUESTION:

Various route selection criteria, mitigation and monitoring measures are proposed throughout Chapter 15 to address potential agricultural effects identified by stakeholders. The following two questions are raised with respect to those noted in Section 15.1.2:

"Avoidance of agricultural buildings wherever feasible" (p. 15-9) is an avoidance and design mitigation measure that was noted as being considered of particular importance, and is identified again (p. 15-10) as one of several attributes considered in terms of effects to agriculture. While a buffer is discussed in terms of intensive hog operations, it is not clear what if any buffer was applied or how it was applied for other buildings and structures, including those known to be or could have been potential agricultural buildings? Can Manitoba Hydro please explain?

Design-based mitigations are identified including one that notes the following: "Scheduling construction activities so that their overlap with crop-growing season and associated activities is reduced and soil disturbance is limited (p. 15-10). For example, peak construction activities are planned for late fall of 2017 to winter 2018 and winter 2019 for the SLTC and New ROW, respectively (Chapter 2)." This is a useful mitigation measure that also will assist in addressing cropland biosecurity. Why is the Riel-Vivian Transmission Corridor (RVTC) not included here? Can Manitoba Hydro please explain?

RESPONSE:

"Buildings" are one of the features within the areas of least preference (Table 5-3, page 5-17). The buildings dataset was based on windshield surveys conducted and included "Agricultural Buildings". A 60 m buffer was placed around agricultural buildings.

In addition to the above, the alternate corridor model has two factors related to "buildings"; Proximity to Buildings and Building Density (Table 5-3, page 5-17).

The proximity to buildings factor contained the following features and suitability values (in brackets):

- >800 m (1),
- 400-800 m (2.7),
- 100-400 m (6.5), and
- Edge of ROW to 100m (9).

This means the model preferred to be at least 800 m away from any building and strongly avoided being within 100 m of any building. The building density factor provided increasing protection for areas with increasing building density (< 1 building / acre preferred over areas with > 10 buildings / acre).

Manitoba Hydro constructs its projects in a manner to limit impacts on land users including taking into consideration timing of its activities to the extent practical; construction activities cannot always occur to avoid farming activities, however. At the time of filing the Environmental Impact Statement (EIS) the conceptual schedule did include construction in the RVTC during months farming activities occur in order to maintain the project schedule. It is important to note that both the SLTC and RVTC are dedicated transmission line corridors largely owned by Manitoba Hydro to facilitate development of transmission lines.

SUBJECT AREA: **Land Use, None**

REFERENCE: **CEC MMTP Round 1 IRs**

QUESTION:

Manitoba Hydro noted on page 16-66 that: "Using zoning and development plans, the development potential of land was ranked based on a low-medium-high scale. Areas ranked as "low" have the least development potential (i.e., preferred for transmission line routing), while areas ranked "high" have high development potential where transmission line development should be avoided if possible." It is not really clear how Manitoba Hydro came up with this ranking system or the information used to prepare it. Can Manitoba Hydro explain its methodology in detail?

RESPONSE:

This analysis is based on the Development Plans and Zoning By-laws available as of October 2014 for the municipalities that may be crossed by the proposed Manitoba–Minnesota Transmission Line Project. The objective was to provide a qualitative method of describing the private development rights and potential for intensification of development across the subject municipalities. Zoning By-laws and development plans were collected for the municipalities identified and reviewed to create a consolidated data set that reflects the policies of the specific plans and by-laws.

Development Plan land use designations were grouped in four categories based on intent statements and designation descriptions. Designations in a lower category are generally more supportive of larger parcel and less intense development than those in higher categories; higher categories are generally supportive of smaller and more intense development.

Zones from the subject area zoning by-laws were similarly grouped by placing them on a scale from 1 to 18 and 20. The low end of the scale (1) represents agricultural zoning the top (18) urban zoning and 20 represents open space zones. Categorization was based on the lot size

requirement for the use that best fit the description of the zone and the lot size requirement for single family dwellings, if permitted. Zones lower on the scale generally require larger lot sizes and are more restrictive with respect to the establishment of new single family dwellings while those higher represent zones that allow for small lot development. A number of areas were also identified that do not have zones, these areas generally are made up of community pastures, provincial forests and crown lands.

The zoning categories were then added to the development plan categories to provide a blended set of categories that were then reviewed and reordered onto a scale of 1 to 12 with provincial lands identified separately. Similar to both the development plan and zoning categories the lower categories are generally made up of agricultural lands and the higher represent urban.

Finally the blended ranks were reorganized onto a 5 point scale (1, 1.5, 2, 2.5, 3) to match the methodology where scoring is based on a 3 point scale, with a score of “1” being best (lowest potential for intensification i.e. agricultural areas) and “3” being worst (highest potential for intensification i.e. urban areas). For this final categorization provincial lands are included in the area 1 as the potential for intensification of private development is low. This analysis is based on the assumption that generally the lower on the scale the less impact a transmission line would have on potential development.

SUBJECT AREA: **Fish and Fish Habitat, None**

REFERENCE: **Chapter 8, Section 8.3**

QUESTION:

No fish community sampling was completed to support the EIS. Existing data from Miliani (2013) were used as the primary source of fish presence data and as a basis for initial screening of crossings. However it is unclear where Miliani's sampling locations are relative to the proposed crossings.

Please provide locations of Miliani's sampling points relative to the stream crossing points.

RESPONSE:

The habitat classifications used are not strictly based on data collected from various sampling points. The Manitoba Drain Maintenance Committee, which consisted of a team of federal and provincial engineers and biologists, developed a fish habitat classification protocol that was to be applied to streams and drainage networks throughout agricultural areas of southern Manitoba. The fish habitat classification protocol combined existing information on topography, drainage, fish communities and habitat conditions with data collected by Fisheries and Oceans Canada (DFO) over five summer field seasons between 2002 and 2006.

Details on the process (and sampling locations) can be found on the Fisheries and Oceans Canada website at:

http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/search-recherche/display-afficher/348785

The information is used to better understand fish habitat types along reaches of waterways. Although Milani's work was drawn upon to better understand waterways in the study area, field visits confirmed general characteristics of waterways and the understandings gleaned from other reports available in the public domain.

To be conservative, mitigation measures outlined in Chapter 8, Section 8.5 will be applied at all stream crossings.

SUBJECT AREA: **Fish and Fish Habitat, None**

REFERENCE: **Chapter 8, Section 8.5**

QUESTION:

Many of the mitigation measures include qualifiers, for example “where possible”, “to the extent possible”, “should be used”, “as soon as possible”, etc.

When will these decisions be made and by whom?

RESPONSE:

The following mitigation measures in Chapter 8, Fish and Fish Habitat contain the phrases mentioned above. Details on when and who will make these decisions are provided below.

- Where possible, transmission line approaches and crossings will be perpendicular to the watercourse.
    - Construction at watercourse crossings will follow the construction environmental protection plan (Appendix 22A). This includes riparian management (Section 2.3, page 2-3) which outlines riparian buffers and machine free zones as well as additional riparian mitigation (Section 2.3.1, page 2-4 and Stream crossings PC-9). The construction supervisor and environmental inspectors will ensure that the plan is followed throughout the construction process.
    - Perpendicular crossings are required at all waterbodies except in situations where this is not feasible due to extenuating circumstances (e.g. obstructions, extreme slopes etc.). Deviations from the plan (non-perpendicular crossings) will only be allowed in these situations. They will be decided by the construction supervisor / environmental inspector and only allowed where the deviation will not increase potential effects to fish and fish habitat.

- Disturbance to the bed and banks of the watercourses will be limited to the extent possible.
    - Construction at watercourse crossings will follow the construction environmental protection plan (Appendix 22A). This includes riparian management (Section 2.3, page 2-3) which outlines riparian buffers and machine free zones as well as additional riparian mitigation (Section 2.3.1, page 2-4 and Stream crossings PC-9). The construction supervisor and environmental inspectors will ensure that the plan is followed throughout the construction process.
    - Riparian buffers and machine free zones apply at all waterbody crossings. In some cases, stream crossings may be required. In these cases heavy machinery will encroach on the waterbody causing some disturbance to the stream bank. Mitigation outlined in the above response (Stream Crossings) will be applied. Situations requiring stream crossings will be decided on by the construction supervisor / environmental inspector on a case by case basis and only allowed where the deviation will not increase potential effects to fish and fish habitat.
- Shrub and herbaceous understory vegetation along with tree root systems will be retained to the greatest extent possible in order to enhance bank stability.
    - Construction at watercourse crossings will follow the construction environmental protection plan (Appendix 22A). This includes riparian management (Section 2.3, page 2-3) which outlines riparian buffers and machine free zones as well as additional riparian mitigation, which limit vegetation clearing (Section 2.3.1, page 2-4 and Stream crossings PC-9). The construction supervisor and environmental inspectors will ensure that the plan is followed throughout the construction process.
    - Riparian buffers and machine free zones apply at all stream crossings. In some cases, stream crossings may be required. In these cases some shrub and herbaceous understory vegetation along with tree root systems may need to be cleared. Mitigation outlined in the above response (Stream Crossings) will be

applied. Situations requiring stream crossings will be decided on by the construction supervisor / environmental inspector on a case by case basis and only allowed where the deviation will not increase potential effects to fish and fish habitat.

- If minor rutting is likely to occur, watercourse bank and bed protection methods (e.g., construction mats) should be used provided they do not constrict flows or block fish passage.
    - Construction at watercourse crossings will follow the construction environmental protection plan (Appendix 22A). This includes riparian management (Section 2.3, page 2-3) which outlines riparian buffers and machine free zones as well as additional riparian mitigation (Section 2.3.1, page 2-4 and Stream crossings PC-9). The construction supervisor and environmental inspectors will ensure that the plan is followed throughout the construction process.
    - The construction supervisor / environmental inspector will determine when construction mats will be required at stream crossings based on bank material (soft banks) or under wet conditions.
- Drill holes will be sealed as soon as possible in the case of a groundwater level rise.
    - The construction supervisor will determine when the drill holes can be sealed at the time of drilling.

SUBJECT AREA: **Fish and Fish Habitat, None**

REFERENCE: **Chapter 8, Section 8.3**

QUESTION:

It appears that only those records of Species of Conservation Concern (SOCC) from the Manitoba Conservation Data Centre (2014) were included in Table 3-7 and records from other sources are rejected. Given the lack of fish sampling effort, how will potential impacts be addressed?

Please provide the rationale for rejecting records of SOCC.

RESPONSE:

The Manitoba Conservation Data Centre (MBCDC) is the storehouse of information on Manitoba's plant and animal species, and is maintained by Manitoba Sustainable Development. Manitoba Hydro uses the information from the MBCDC as it is the most complete source of information on potential Species of Conservation Concern (SOCC) occurring in any proposed study area in Manitoba.

The Province defines SOCC as species that are rare, disjunct, or at risk throughout their range or in Manitoba and in need of further research. The term also encompasses species that are listed under *The Endangered Species and Ecosystems Act* (C.C.S.M., c. E111), or that have a special designation by the Committee on the Status of Endangered Wildlife In Canada (COSEWIC), (Chapter 8, Glossary of Technical Terms, page 8-xiv).

Manitoba Hydro is unaware of other sources for this type of information, and therefore did not consciously reject other sources or specific SOCC.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

No surveys were conducted for the endangered bat species Little Brown Myotis and Northern Myotis although both are expected to inhabit the RAA area. Existing data on bat use of the RAA are apparently lacking. Clearing the transmission corridor could remove maternal roost trees but there was no effort to quantify or mitigate the effect.

Please explain how clearing the transmission corridor might impact bat maternal roosts and how this impact will be mitigated.

RESPONSE:

Information regarding bats was discussed in Section 9.4.3 and 9.5.2.1.1 of Chapter 9 in the EIS. The single greatest threat to populations of Little Brown Myotis and Northern Myotis in Canada is white nose syndrome (Environment and Climate Change Canada 2015). White nose syndrome is not yet known to occur in Manitoba.

Project effects on active maternal roosts are not anticipated due to the timing of clearing activities (Chapter 22 – Construction Environmental Protection Plan). While it is possible that some suitable maternal roost sites may be removed, the creation of forest openings and edge habitat may improve the suitability of other potential roost trees by increasing their proximity to optimal foraging habitat.

References:

Environment Canada. 2015. Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada [Proposed]. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. ix + 110 pp.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

Fieldwork effort was constrained by the lack of access to private land (e.g. p. 2.97). This applies to Vegetation and Wetlands as well as wildlife.

As a result of lack of access, were any important habitat areas not sampled?

RESPONSE:

Prior to the 2014 field season, the Final Preferred Route (FPR) had not been established. The field program was set up to better characterize multiple alternative routes, including a broader area than just the FPR. Field survey data contributed to route selection and was designed to characterize conditions related to multiple alternative routes. A wide-reaching and representative field program was designed to accommodate route refinement over time. Additional data will be collected in gap areas of higher concern (e.g., potential candidate protected areas and rare plant locations) in the PDA (Project Development Area) prior to construction. Should any sensitive areas be found, mitigative measures will be applied, such as those described in Chapters 9, 10, 11. Sensitive areas found on the ROW will be flagged for avoidance and if previously unidentified species or ecosystems of concern (e.g., tall-grass prairie) are encountered, they will be noted for potential additional mitigation. A pre-construction survey is planned to capture areas along the FPR that may have been missed in earlier surveys.

SUBJECT AREA: **Vegetation and Wetlands, Wildlife and Wildlife Habitat**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

The habitat classes used to assess wildlife habitat availability are very coarse. For example forest classes included only “hardwood”, “softwood” and “mixedwood” without considering stand age or tree species composition) (Table 9-2).

A finer scale classification system may have provided more insight into habitat suitability and potential loss. Why was this not done?

RESPONSE:

The FRI database was used to determine and compare land cover in the PDA, LAA and RAA because it provides common cover classes for all spatial boundaries (Table 10-1). This database was also used to assess Project-related change in landscape, cover and plant species in the LAA and RAA. The FRI data are at a 1:15,848 scale, which is a finer scale than the 1:20,000 scale of the LCC data. However, the FRI data were collected prior to 2000 and do not include a class for swamp and shallow open water wetlands. The FRI data also under-represent the area (ha) of wetlands in the LAA and RAA.

Land cover mapping was refined for the PDA to provide greater detail and certainty about potential Project-related effects on vegetation and wetlands and to develop appropriate mitigation measures. Native vegetation and wetland mapping in the PDA was completed to a 1:3,000 scale with a minimum 10 m x 10 m polygon size. Wetland class, type and boundaries within the PDA were interpreted and delineated using land cover data and air photograph imagery from wet and dry years (2007 – 2012), in conjunction with data from rare plant, wetland and soils surveys undertaken for the Project. This finer classification system helped to provide more insight into habitat suitability and potential loss in the PDA.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

Surveys were conducted for Least Bittern or Short-eared Owl, species at risk that are not well-surveyed by point counts. Eastern Whip-poor-will surveys ended at ½ hour after sunset, before the peak calling period of this species. The early termination of the survey probably caused many Whip-poor-wills to be missed.

Table 9-15 states that point count surveys will be conducted before construction in select areas of the PDA known to support species of conservation concern. How will these locations be selected? Are the existing data adequate to identify areas supporting species of conservation concern?

Survey effort for bird Species at Risk was light and may have been insufficient to assess potential effects on some species. Only 74 point counts were completed in the LAA and only eight point count surveys were conducted in agricultural lands even though several Species at Risk including Bobolink and Short-eared Owl nest in pastures and hayfields. Point count locations were chosen using a stratified random method (p. 9-25) which may underrepresent habitats for SAR with such a small sample size. No targeted

RESPONSE:

Prior to the 2014 field season, the Final Preferred Route (FPR) had not been established. The field program was designed to characterize multiple alternative routes in an area broader than the FPR, and the data collected contributed to FPR selection.

The assessment of Project effects on species of conservation concern (SOCC) focused largely on anticipated changes in the availability of potentially suitable SOCC habitats within the RAA. SOCC habitats are assumed to have the potential to support SOCC even if none are detected during surveys. Specific surveys targeting least bittern and short-eared owl did not occur; however, desktop data, Manitoba Breeding Bird Atlas data, field observations, and habitat

information contributed to understanding the potential for these species to exist within their preferred habitats (Section 9.4.2). A discussion of potential Project effects on these species and their habitats is found in Section 9.5.2.3.1.

Although the survey time for eastern whip-poor-will was not entirely optimal, successful detections were consistent with the known distribution of eastern whip-poor-will within the RAA and availability of its habitat, were factored into the assessment (Section 9.5.2.3.1), mitigation planning, and monitoring (Chapter 22).

Through the application of adaptive management, Manitoba Hydro is committed to the continual improvement of the draft Environmental Monitoring Program (Appendix 22C). The program's objectives, techniques, and methods will be continually improved based on information acquired through the environmental licensing process, public hearings, and current or ongoing Manitoba Hydro monitoring efforts for SOCCs in other parts of Manitoba.

Most of the SOCC listed in Table 9-15 are at the edge of their range and are considered rare or uncommon due to the lack of suitable habitat and depressed populations. As is often the case in field studies of species with very low population densities, future monitoring and follow-up activities of potential Project effects may be challenging. Project monitoring may require that some SOCC be targeted in potentially suitable habitats to determine which species occur in sufficient numbers and distribution in the LAA and RAA to allow for Project effects hypotheses testing. For example, surveys for common nighthawk and eastern whip-poor-will could include passive (i.e., listening only) techniques (BC RIC 1998, Bird Studies Canada 2014, Saskatchewan Ministry of Environment 2015). Some SOCC such as least bittern and yellow rail may require active (i.e., call broadcast or play-back) point count techniques (Bazin and Baldwin 2007, Jobin *et al.* 2011).

The application of sampling techniques and suitable locations will be selected and refined based on existing data and habitat quality measures. To ensure that adequate sample sizes are surveyed within select habitats, species area curves will be calculated. Species area curves could provide a measure of confidence of the presence or absence of various SOCC in different

habitats. Power analyses can then be used to determine which species can or should be used for longer-term monitoring purposes.

The key focus of SOCC studies will be placed on golden-winged warbler. Golden-winged warbler were chosen as a focal species because they are the only species to have defined critical habitat identified in the PDA and have potential for habitat improvement through Manitoba Hydro's Integrated Vegetation Management Program. Golden-winged warbler monitoring will most likely include call-playback surveys within the portion of the ROW that intersect the five critical habitat grid squares of golden-winged warbler habitat as outlined in Environment Canada's recovery strategy (Environment Canada 2014). Before-and-after habitat analyses will be quantified using LiDAR imagery and/or vegetation sampling. Further information regarding the survey methods can be found in the MMTP Environmental Monitoring Plan, and interrogatory questions # EC/MH-003 and CEC-IR-049. While conducting these surveys, incidental observations of other SOCC will be recorded and reported.

References:

Bazin, R., and Baldwin, F.B. 2007. Canadian Wildlife Service standardized protocol for the survey of yellow rails (*Corturnicops noveoboracensis*) in prairie and northern region. Environment Canada. Winnipeg, MB.

BC RIC (British Columbia Resources Inventory Committee). 1998. Inventory methods for nighthawk and poorwill. Resources Information Standards Committee. Province of British Columbia. Standards for components of British Columbia's biodiversity Number 9. Victoria, British Columbia, Canada.

Bird Studies Canada. 2014. Guidelines for conducting eastern whip-poor-will roadside surveys in Ontario. Bird Studies Canada, Port Rowan, Ontario. 12pp. Accessed February 21, 2017. https://www.birdscanada.org/birdmon/wpwi/resources.jsp?dir=2014%20Whip-poor-will%20Roadside%20Survey%20Guidelines.

Environment Canada. 2014. Recovery strategy for the golden-winged warbler (V*ermivora chrysoptera*) in Canada. Species at Risk Recovery Strategy Series. Environment Canada, Ottawa, 57 pp.

Jobin, B., Bazin, R., Maynard, L., McConnel, A., and Stewart, J. 2011. National least bittern survey protocol. Technical Report Series No. 519, Environment Canada, Canadian Wildlife Service, Quebec Region, Quebec, 26 pp.

Saskwatchewan Ministry of Environment. 2015. Common nighthawk survey protocol. Fish and Wildlife Branch Technical Report No. 2015-15.0. 3211 Albert Street, Regina, Saskatchewan. 7pp.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

Right-of-way clearing will remove 475 ha of potential Golden-winged Warbler, but the EIS concludes that the habitat loss will be short-term as shrubs regenerate in the right-of-way. Is there risk that suitable habitat will not regenerate? What are the implications of the time lag between clearing and habitat regeneration?

RESPONSE:

Details of the Right-of-Way (ROW) Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation of the Manitoba–Minnesota Transmission Project and implementation through the Integrated Vegetation Management Program (IVMP) is presented in response to Question #EC/MH-003 (attached as CEC-IR-049_Attachment. As outlined in that response, the risk of suitable golden-winged habitat not regenerating is low. Preventative mitigation measures will be implemented during vegetation clearing activities to limit the amount of critical golden-winged habitat that is disturbed and/or removed during construction.

SUBJECT AREA: **Wildlife and Wildlife Habitat, Vegetation Management**

REFERENCE: **MCWS MMTP IR No 2 - Item 3**

QUESTION:

As noted by the Proponent on page 9-67 of the EIS, the project intersects proposed critical habitat identified in the proposed Recovery Strategy for the Golden-winged Warbler in Canada - 2014 https://www.registrelep-sararegistry.gc.ca/default.asp?lang=En&n =86D89339-1.

On page 9-77 of the EIS, the Proponent states that right-of-way clearing will remove 475 ha of potential golden-winged warbler habitat, but that the loss will be short-term as new shrubs and herbs will regenerate and provide 472 ha of habitat. The Proponent further states that the net loss of habitat is 2 ha and consists of low quality golden-winged warbler habitat.

On page 9-96 of the EIS, the Proponent states that "In sensitive areas of critical golden-winged warbler habitat, right-of-way vegetation will be selectively cleared and managed with the integrated vegetation management program to enhance suitability for golden-winged warbler."

Provide a detailed plan showing how the destruction of critical habitat for golden-winged warbler will be minimized in the near and long terms, including a description of how right-of-way vegetation will be selectively cleared and managed to enhance habitat suitability for golden-winged warbler.

RESPONSE:

Manitoba Hydro carefully considered the effects of the project on wildlife and wildlife habitat. Golden-winged warblers (*Vermivora chrysoptera*) were identified as a species requiring careful consideration due to their designation in the *Species at Risk Act (2002)*, and the identification of critical habitat along a portion of the Project area. As outlined in the environmental

assessment, Manitoba Hydro carried out detailed studies on the breeding locations, habitat preferences, and species biology in preparing the Construction Environmental Protection Plan and Environmental Monitoring Plan.

As part of Manitoba Hydro's Research and Development program, Manitoba Hydro was a major sponsor of Bird Studies Canada - Manitoba Breeding Bird Atlas. This project has helped identify the breeding range of all birds in Manitoba, including the golden-winged warbler. As a result of this seven year citizen science research study, Manitoba Hydro learned that existing transmission line right-of-ways (ROWs) in vicinity of the MMTP, including M602F and R49R, were providing suitable habitat for golden-winged warblers. Manitoba Hydro is committed to developing this project in a way that will carefully consider the habitat requirements and preferences of golden-winged warbler.

Below is a detailed plan outlining a Right-of-Way Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation of the Manitoba–Minnesota Transmission Project.

Right-of-Way Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation of the Manitoba–Minnesota Transmission Project

Background

Golden-winged warbler is one of eleven Species of Conservation Concern (SOCC) associated with open forest habitat, which is discussed as part of potential environmental effects on wildlife and wildlife habitat (Chapter 9, Section 9.4.2 Manitoba Hydro 2015). It is the only species in the Regional Assessment Area (RAA) to have defined critical habitat.

The golden-winged warbler is a ground-nesting songbird that breeds in shrubby habitats adjacent to mature stands of deciduous and mixedwood forest (Manitoba Hydro 2015). It uses forest edge habitat and openings containing shrubs and grasses. Habitat is often regenerated by natural and human disturbances, including hydroelectric utility corridors, which can be preferred habitat for this species if corridors are maintained in a manner that retains shrubs and herbs along forest edges.

There are records from Bird Studies Canada and the Manitoba Breeding Bird Atlas of golden-winged warbler occurrences throughout the east portion of the RAA. Observations are concentrated in the areas surrounding the communities of Ste-Genevieve, Ross and Richer. In addition, six golden-winged warblers were detected during MMTP environmental assessment breeding bird surveys north and southwest of the community of Marchand, south of the community of Richer, and south of the Watson P. Davidson Wildlife Management Area (WMA) (Manitoba Hydro 2015).

Statement of Intent

The "*Recovery Strategy for the Golden-winged Warbler (Vermivora chrysoptera) in Canada*" was published in 2014 (Environment Canada 2014). Manitoba Hydro recognizes that a portion of the Manitoba-Minnesota Transmission Project intersects an area defined in this strategy as critical golden- winged warbler habitat. By utilizing an integrated vegetation management approach, application of standard operating procedures, best practices and the usage of adaptive

management techniques, Manitoba Hydro will endeavor to maintain or enhance the critical habitat of the golden-winged warbler within the Project right-of-way (ROW).

ROW Habitat Management Area for Golden-winged Warbler

For the purposes of this plan, a golden-winged warbler ROW Habitat Management Area (HMA) was developed. This area is comprised of the portion of the project ROW that intersects the five critical habitat grid squares as outlined in the recovery strategy (approximately 70 spans) (Map 1).

Within the "*Recovery Strategy for the Golden-winged Warbler (Vermivora chrysoptera) in Canada*" focal areas designate critical golden-winged warbler habitat on a broad scale throughout their range. Manitoba contains three focal areas, GL 1 near Dauphin along the western edge of the province, GL 2 in the Interlake, it is within GL 3 located in southeastern part of the province, through which the proposed ROW crosses. These focal areas are subdivided into 10 x 10km grid squares, based on the standardized UTM grid. A total of 177 grid squares occur in Manitoba, 60 of which are located in GL 3. Map 2 illustrates Potential Golden-winged Warbler Habitat and Critical Golden-winged Warbler Habitat Grids in the RAA intersected by the Project's transmission line ROW.

Goal and Objectives

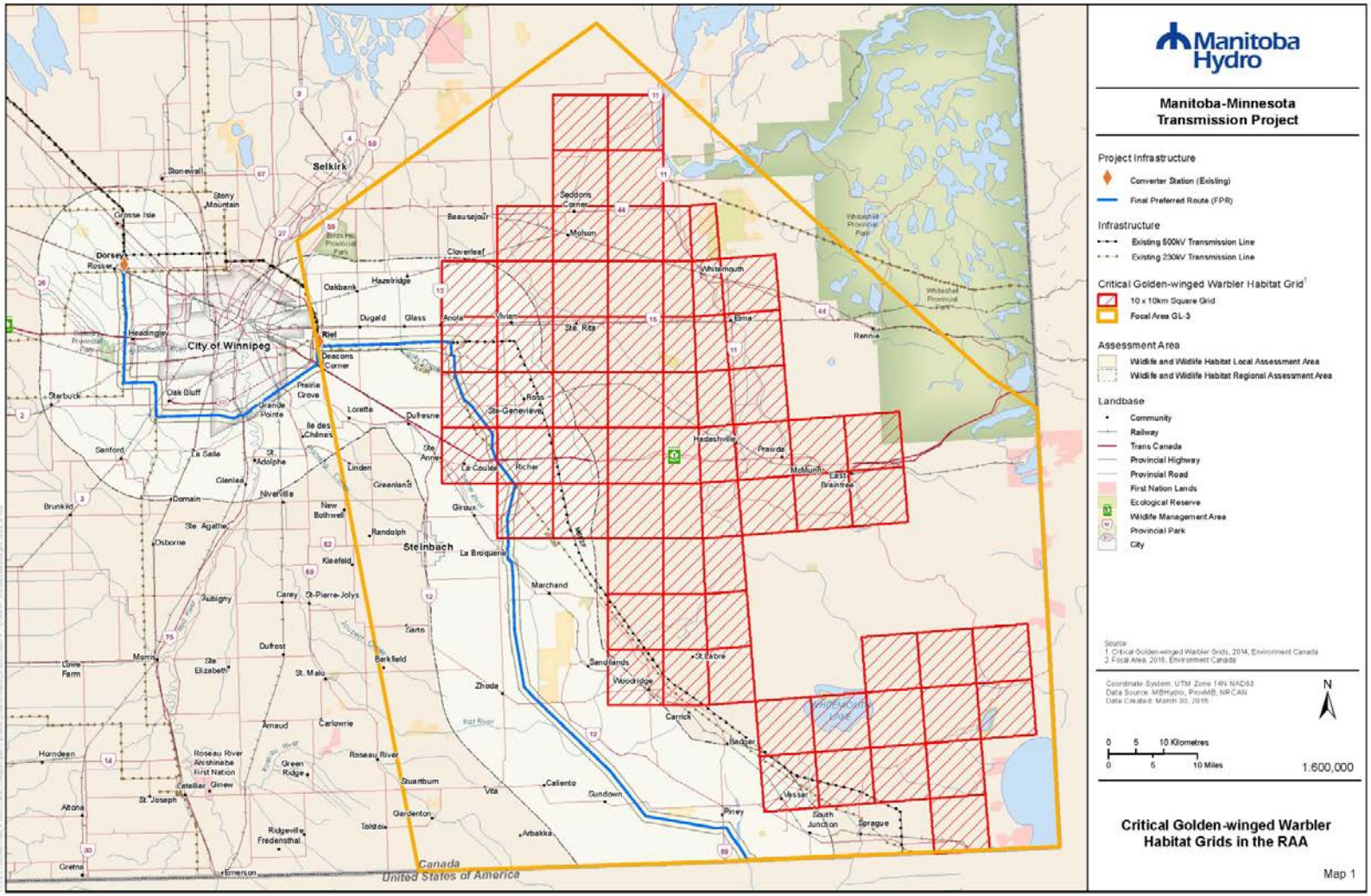
Goal: In sensitive areas of critical golden-winged warbler habitat, ROW vegetation will be selectively cleared and maintained using an integrated vegetation management approach to enhance long-term habitat suitability for golden-winged warbler.

Objective 1: To improve understanding of golden-winged warbler habitat distribution along the Project ROW.

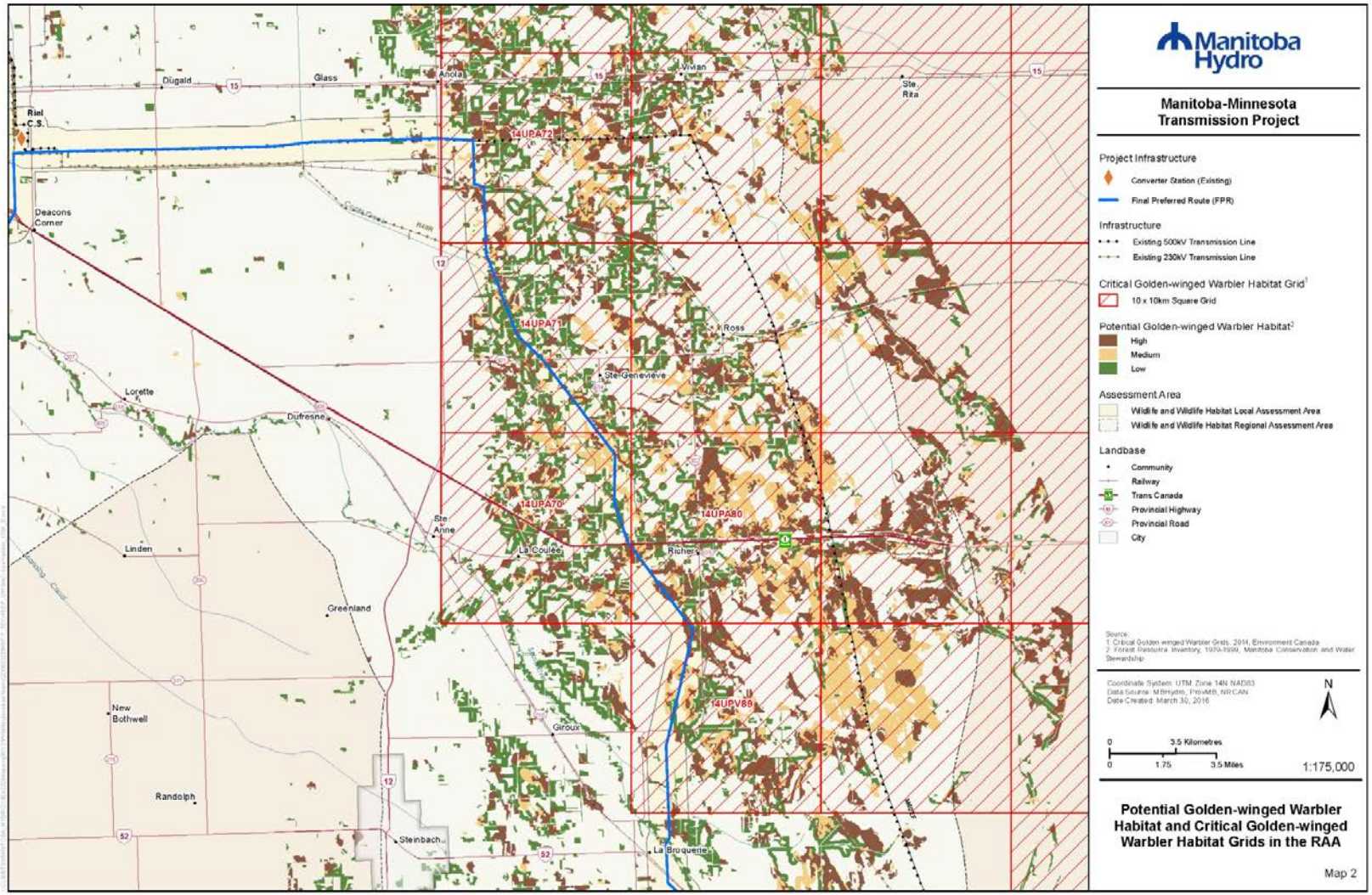
Objective 2: To apply construction clearing prescriptions suitable for the maintenance and development of potential golden-winged warbler habitat while allowing for safety considerations in the construction of the Project.

Objective 3: To apply operational vegetation maintenance prescriptions suitable for the enhancement of potential golden-winged warbler habitat, while abiding by legal requirements for the safe operation and maintenance of the Project.

Objective 4: To monitor the response of the local golden-winged warbler population along the Project ROW.



Map 1. Critical Golden-winged Warbler Habitat Grids in the RAA.



Map 2. Potential Golden-winged Warbler Habitat and Critical Golden-winged Warbler Habitat Grids in the RAA.

Baseline Conditions

Landscape-scale habitat suitability for golden-winged warblers was determined for the five 10 x 10km grid squares that intersect the ROW using Manitoba Conservation and Water Stewardship Forest Resource Inventory Data. The habitat standards presented in Environment Canada Recovery Strategy (50-75% forest cover that is composed of 50% deciduous or mixed forest, with less than 30% coniferous forest) (Environment Canada 2014), were used as a reference to calculate suitable and non-suitable habitat.

At baseline, one of the five grid squares met the Environment Canada standards for being suitable golden-winged warbler habitat, while the remaining four contained an amount slightly below the recommended amount of suitable habitat (Table 1, Map 2). Suitable habitat consisted mainly of broadleaf forest. Mixedwood forest was scarce. The predominant non-suitable habitat at the landscape scale was agriculture. Developed areas and meadow were less abundant than agricultural land, but are still relatively common in each grid square compared to other habitat types (Table 1).

Table 1. Baseline habitat areas (ha) within the 10 x 10km grid squares intersected by the Project ROW based on Environment Canada's landscape-scale habitat definition (Environment Canada 2014).

		10 x 10km Grid Square				
	Habitat Type (ha)	**14PA70**	**14PA71**	**14PA72**	**14PA80**	**14PV89**
Habitat	Broadleaf	3,787	3,914	4,748	5,355	2,978
	Mixedwood	22	2	7	32	102
	Total	3,809	3,915	4,755	5,388	3,081
	Percent of Grid	38	39	48	54	31
Non-Habitat	Coniferous	13	22	67	45	456
	Developed	1,001	907	847	621	279
	Fields (Agriculture)	4,415	4,189	2,792	1,248	2,536
	Willow/Alder	394	365	679	1,277	877
	Marsh Muskeg	23	15	46	394	1,925
	Meadow	257	588	763	977	750
	Shelter Belts	89	0	3	0	0
	Treed Muskeg	0	0	47	1	87
	Water	0	0	0	51	10
	Total	6,192	6,085	5,245	4,612	6,919
	Percent of Grid	62	61	52	46	69

Habitat suitability for golden-winged warblers was also determined for the section of the ROW that intersects the five 10 x 10km grid squares. A more detailed habitat model presented in the EIS (Appendix C) was applied to Forest Resource Inventory data to identify potential nesting and foraging habitat (EIS Map 9-24). The ROW was defined by buffering the Project centreline by 80m for sections that will use self-supporting towers and 100m for sections that will use guyed-towers.

In the ROW that intersects the five 10 x 10km critical habitat grid squares, the Project ROW contains approximate totals of 64ha of high, 40ha of medium, and 57ha of low potential habitat for golden-winged warblers (Table 2). Much of the existing habitat within the proposed ROW is considered non-habitat for golden-winged warblers (Table 2, Map 2).

Table 2. Baseline habitat areas (ha) within the five 10 x 10km critical habitat grid squares within the Project ROW based on EIS habitat models.

	Habitat Type	**Potential Habitat Quality**			**Total (ha)**
		High (ha)	**Medium (ha)**	**Low (ha)**	
Habitat	Grassland	4.7	5.7	0.0	10.4
	Productive Forest	44.8	30.5	57.0	132.3
	Shrub	14.9	3.7	0.0	18.6
	Total	64.4	39.9	57.0	161.3
Non-Habitat	NA	NA	NA	NA	199.3
					360.6

Implementation Phases

Planning Phase

In developing this section the publications "The Best Management Practices for the Golden-winged Warbler Habitat on Utility Rights of way in the Great Lakes" (ND) and "Best Management Practices for Golden-winged Warbler Habitat in the Aspen Parkland Transition Zone of Canada" (ND) provided valuable guidance on how best to plan and maintain vegetation along a ROW for the benefit of golden-winged warblers.

Habitat Management Sites (HMS) will be approximately 10ha in size, which is roughly equivalent to the ROW area between three transmission towers (two spans). There are approximately 90 spans in total within the ROW habitat management area. The size of the HMS is derived from recommendations made by Roth et al. (2012), who suggest that management sites be 2ha in size if located within 300m of existing suitable habitat and 10ha in size when located further than 300m from existing suitable habitat. Potential Golden-winged Warbler Habitat (Map 2) and vegetation surveys as described below will inform the selection of the HMS.

The near and long-term habitat management objective for the golden-winged warbler is to provide a mosaic of different vegetation types that are preferred by this species within each HMS. Habitat preferences for this species have been well documented and are generally described as clumps of shrubs interspersed with herbaceous openings, adjacent to mature forest. Specifically, ideal golden-winged warbler habitat within a HMS is defined as: (GWWAWG 2013)

- Tall shrubs and saplings (1-4m) unevenly distributed as clumps, consisting of up 30-70% of the management site;
- Shrub and sapling clumps interspersed with herbaceous openings that are primarily composed of forbs with a smaller proportion of grasses;

- Low woody vegetation (1m), leaf litter, and bare ground that occupies less than 25% of the opening's space;

- Low density of overstory trees (10-15/ha).

As the Project proceeds, the first objective will be to validate the amount of potential golden-winged warbler habitat present within the proposed ROW using vegetation surveys. Vegetation surveys will use a combination of remotely-sensed data, including LiDAR (light detection and ranging) and high-resolution imagery, as well as data collected from the ground. Remotely-sensed data will be used to improve understanding of where potential golden-winged warbler habitat is located along the ROW. Both spatial and quantitative information of tree and shrub species, their heights and grass-forb habitat patches derived from LiDAR imagery will be mapped. One of the most important factors in developing clearing prescriptions will be to determine the extent of tree growth along the Project ROW. Trees are not compatible with the safe operation and maintenance of a transmission line and must be managed when their height exceeds the vegetation clearance requirements for the safe operation of a transmission line. The derived plant community distributions will be used to develop vegetation management prescriptions for each management site. As additional digital imagery and ground-based vegetation survey data becomes available for the Project development area, Manitoba Hydro will develop specific mapping products to help guide on the ground clearing activities in golden-winged warbler critical habitat.

Construction Phase

Clearing of the ROW for transmission line construction will be considerate and selective in areas designated as golden-winged warbler habitat from the vegetation mapping described above. Within each HMS (two spans), vegetation clearing will occur in two separate zones (Figure 1). Vegetation management in Zone 1 (0-12m on either side of the centreline of the ROW and up to a 100 x 100m cleared area around the tower base) will involve the clearing of all trees and shrubs to provide safe access and work areas at tower footprints and during conductor

stringing. Vegetation management within Zone 1 will likely involve the use of mechanical equipment such as feller-bunchers or mulchers to remove all standing woody vegetation.

Vegetation management within Zone 2 (12-50m on either side of the centreline of the ROW between tower footprints) will involve the selective removal of woody vegetation. In this zone, all trees will be removed, but other vegetation, particularly forbs, some saplings, and most shrubs will be retained to the extent possible. The use of feller-bunchers and hand clearing will likely be used to remove all trees in this zone. On the outer edges of Zone 2, clearing equipment operators will work closely in real-time with Manitoba Hydro environmental inspectors in an effort to develop a feathered edge by selectively clearing vegetation in an uneven pattern to create a mosaic of habitats as described in Petzinger et. al (ND), Artuso et al. (ND) and GWWAWG (2013).

The conceptual vegetation clearing prescription described above applies to forested habitat. Large shrubland, wet areas, and grassland dominated plant communities will not require vegetation clearing beyond Zone 1, and as such will be maintained as close as possible to their existing and naturally occurring state.

Clearing activities will take place during the non-breeding season to minimize the disturbance during this critical period. If any construction activities cannot be achieved during the non-breeding season, pre-clearing nest surveys will be conducted, and a set-back distance of 300m from breeding and nest sites will be used to prevent disturbances to golden-winged warblers (EIS, Ch. 22, Appendix E). In addition, supply and marshalling yards will be located in previously developed areas or in low potential golden-winged warbler habitat.

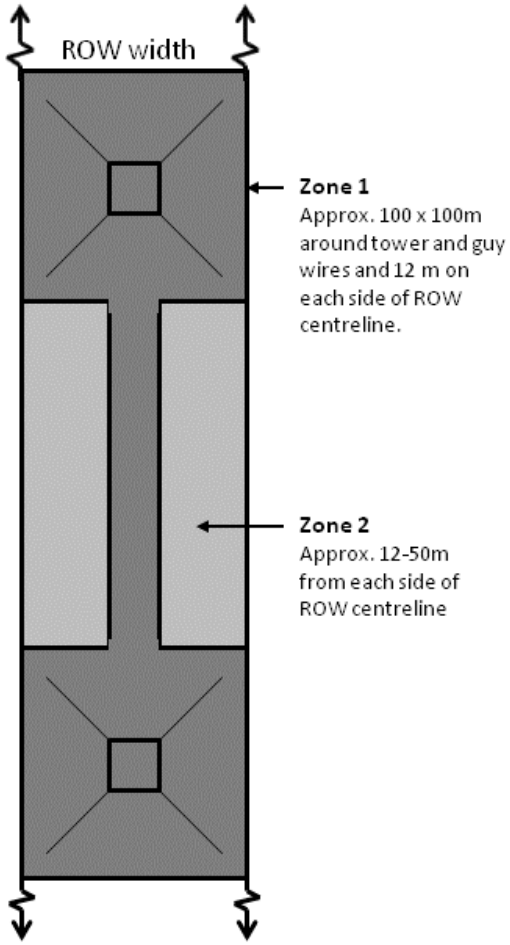


Figure 1. Vegetation clearing and management zones (100m ROW) within the five 10 x 10km critical habitat grid squares within the Project ROW (not too scale).

Operations Phase

161 The goal of long-term habitat management is to provide golden-winged warbler habitat as
162 described above within the HMS. Following construction, within forested areas, shrubs and
163 other vegetation will regenerate naturally through the spread of suckers and new growth from
164 the existing seed bank. During operation and prior to vegetation management activities,
165 Manitoba Hydro will assess vegetation diversity, distribution and height along the ROW. These
166 results will be compared to the habitat preferences of golden-winged warbler (see Planning
167 Section above). Where ROW vegetation characteristics substantially deviate from golden-

winged warbler habitat preferences, as outlined in Petzinger et. al (ND), Artuso et al. (ND) and GWWAWG (2013), Manitoba Hydro will adjust vegetation management prescriptions within HMS accordingly using an adaptive management approach.

Typically, vegetation management along transmission line ROWs occurs every 8-10 years (EIS, Section 2.13.3). Vegetation within Zone 1 will be maintained as a mosaic of grass, forbs and low shrubs to prevent interference with the transmission line and allow access for transmission line inspection and maintenance. Vegetation management in this zone will likely use a combination of mechanical mowing and the selective application of herbicides to prevent tree growth.

Vegetation within Zone 2 will be selectively managed to remove all trees but maintain the presence of a forbs, grasses, saplings, and a low and tall shrub layer. Along the outer edge of this zone, management will likely include the use of selective brush mowing and/or hand-clearing of trees to leave patches of shrubs and taller woody vegetation to create a feathered edge, as shown in Figure 2. Selective herbicide use may also be applied to prevent tree growth. Manitoba Hydro has considered the general vegetation management techniques described by Roth (2012b) to maintain specific habitat conditions for golden-winged warbler.

Figure 2. Example of high quality golden-winged warbler habitat along a transmission line ROW with a feathered edge (Petzinger et al. (ND). Photo credit Tom Langen).

Burning is not considered as a management tool in this plan due to risk of wildfire, the presence of private property, and other logistical constraints. Habitat management within farmland, pasture, or other developed land types is not practicable due to private land considerations and the lack of suitability for golden-winged warblers.

To maximize the diversity and habitat structure in the ROW, vegetation management will be staggered in space and time amongst HMS. An adaptive management approach will be used to determine the timing of vegetation prescriptions in each HMS as habitat development depends on numerous environmental factors. By alternating vegetation management within parts of Zone 2 over a suitable period (dependent on local environmental conditions), different stages of regenerating forest will develop within a single habitat management site and enhance the potential habitat suitability for golden-winged warblers (Figure 3).

Project Monitoring

The Manitoba-Minnesota Transmission Project - Environmental Monitoring Plan (Appendix 22C) outlines monitoring activities for bird species of conservation concern, including golden-winged warblers.

These monitoring objectives include:

- Identify the location of bird species of conservation concern within or in close proximity to the Project footprint with the purpose of establishing a Control-Impact monitoring program for known individuals and/or groups;
- Monitor species of conservation concern in close proximity to the transmission line and compare annual site fidelity and abundance to nearby control sites; and
- Determine the effectiveness of mitigation measures and, if appropriate, propose revisions to the existing plans or develop new mitigation options should unexpected impacts to birds occur as a result of construction or operation activities.

Figure 3. Examples of high quality (top) and poor quality (bottom) golden-winged warbler habitat in a transmission line ROW ((GWWAWG (2013). Photos credits from top and bottom: Sara Barker Swarthout; and Amber Roth)

References:

Artuso, C., Will, T. Friis, W., Moulton, L., Swarthout, S.B. ND. Best management practices for golden-winged warbler habitat in the Aspen Parkland Transition Zone of Canada. Golden-winged Warbler Working Group Publication. 2 pp.

Environment Canada. 2014. Recovery strategy for the golden-winged warbler (*Vermivora chrysoptera*) in Canada. Species at Risk Recovery Strategy Series. Environment Canada, Ottawa, 57 pp.

GWWAWG (Golden-winged Warbler Working Group). 2013. Best management practices for golden-winged warbler habitats in the Great Lakes Region. Golden-winged Warbler Working Group Publication. 8 pp.

Manitoba Hydro. 2015. Manitoba - Minnesota Transmission Project. Environmental Impact Statement. Chapter 9. Assessment of potential effect on wildlife and wildlife habitat.

Petzinger, S., Langen, T.A., Kubel, J.E., Roth, A., and Swarthout, S. ND. Best management practices for golden-winged warbler habitat on utility rights-of-way in the Great Lakes. Golden-winged Warbler Working Group Publication. 2 pp.

Roth, A.M., Rohrbaugh, R.W., Aldinger, K., Bakermans, M.H., Barker Swarthout, S., Buehler, D.A., Confer, J.L., Crawford, D., Friis, C., Fowlds, R.M., Larkin, J.L., Loegering, L.J., Lowe, J.D., Piokowski, M., Rosenberg, K.V., Smalling, C., Terhune, T.M., Vallender, R., Will, T., and Wood, P.B. 2012. Golden-winged warbler breeding season conservation plan. In Roth, A.M. Roohrbaugh, R.W., Will, T., Beuhler, D.A. editors. Golden-winged warbler status review and Conservation Plan. Available from www.gwwa.org/.

Roth, A.M., Rohrbaugh, R.W., Will, T., and Buehler D.A. 2012b. Golden-winged warbler status and review and conservation plan. Golden-winged Warbler Working Group Publication 175 pp. Available from www.gwwa.org/.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

The vegetation management for Golden-winged Warbler habitat is described in general terms (p. 9-77, 9-82, 9-118) but lacks details.

Please describe the vegetation management plan and effectiveness monitoring plan for Golden-winged Warbler.

RESPONSE:

Details of the Right-of-Way (ROW) Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation of the Manitoba–Minnesota Transmission Project and implementation through the Integrated Vegetation Management Program (IVMP) was presented in response to Question #EC/MH-003 (attached to CEC-IR-049).

Based upon work that has been conducted over the past few months, the MMTP Environmental Monitoring Plan (Appendix 22C) will be updated to include a monitoring program for Golden-winged warbler habitat as found below:

Golden-winged Warbler Habitat

Golden-winged warbler habitat will be sampled, and the implementation of the golden-winged warbler management plan will be verified. A primary objective will be to validate the amount of potential golden-winged warbler habitat present within the proposed ROW. A combination of remotely-sensed data and high-resolution imagery will be used to determine potential habitat, which will be identified by Manitoba Hydro. Mapped information is anticipated to include tree and shrub species and heights, and open patches.

Habitat Management Sites (HMS) will be approximately 10ha (roughly equivalent to the ROW area between three transmission towers), which is derived from recommendation by Roth et al. (2012). Both habitat mapping and ground surveys will inform the selection of HMS. Habitat preferences for the golden-winged warbler are generally described as shrub cover interspersed with herbaceous openings, adjacent to mature forest.

In suitable golden-winged warbler habitat, pre-construction surveys will involve quantitative native vegetation surveys, along the transmission line ROW. Sites selected for surveys will have plots established for future vegetation monitoring. Vegetation will be sampled for composition, abundance and structure. Sampling of selected sites will follow methods outlined by Redburn and Strong (2008) and involve the establishment of five 2.5m by 2.5m quadrats with a 1m by 1m nested quadrat spaced at 5m increments along a 30m transect for shrubs 1-2.5m tall and herbs and low shrubs ≤1m tall, respectively. Transects will be located on sites considered representative of the stand being sampled. The first quadrat will be placed at the 5 m mark. The composition of tree cover >2.5m tall will be estimated using a 20m by 30m plot centered on each transect. Transects will be permanently located along the transmission line ROW, longitudinally, and approximately in the centre of the ROW, but off the equipment path. Plant cover will be estimated to the nearest 1% for species <15% cover and nearest 5% for those with higher cover. GPS coordinates and photographs will be taken at each sampling site.

Environmental monitoring of golden-winged warbler habitat (after construction) will occur at the same sites previously surveyed, to assess the change in vegetation. Environmental monitoring will involve the identical quantitative methods described above (native vegetation survey). All sites will be photographed. The collection of vegetation information will occur at a similar time during the growing season to maximize the comparability of data. After field sampling, the data will be digitized and mean values for vegetation cover will be calculated. Total species cover, species richness and diversity measures will be calculated for each plot. Statistical testing may be used to determine if differences occur between baseline samples and post-clearing.

Through the application of adaptive management, Manitoba Hydro is committed to the continual improvement of the draft Environmental Monitoring Program (Appendix 22C). The program's objectives, techniques, and methods will be continually improved based on information acquired through the environmental licensing process, public hearings, and current or ongoing Manitoba Hydro monitoring efforts for SOCCs in other parts of Manitoba.

References:

Redburn, M.J. and W.L Strong. 2008. Successional development of silviculturally treated and untreated high-latitude *Populus tremuloides* clearcuts in northern Alberta, Canada. Forest Ecology and Management, 255: 2937-2949.

Roth, A.M., Rohrbaugh, R.W., Aldinger, K., Bakermans, M.H., Barker Swarthout, S., Buehler, D.A., Confer, J.L., Crawford, D., Friis, C., Fowlds, R.M., Larkin, J.L., Loegering, L.J., Lowe, J.D., Piokowski, M., Rosenberg, K.V., Smalling, C., Terhune, T.M., Vallender, R., Will, T., and Wood, P.B. 2012. Golden-winged warbler breeding season conservation plan. In Roth, A.M. Roohrbaugh, R.W., Will, T., Beuhler, D.A. editors. Golden-winged warbler status review and Conservation Plan. Available from www.gwwa.org/.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.3**

QUESTION:

The federal Recovery Strategy for the Golden-winged Warbler in Canada (Environment and Climate Change Canada 2016a) designates parts of the PDA as critical habitat. The 2016 Policy on Critical Habitat Protection on Non-federal Lands (Environment and Climate Change Canada. 2016b) states that SARA may supersede the laws of the province or territory for "activities likely to result in the destruction of critical habitat".

The 2016 Policy Report identified above lays out a series of steps with respect to critical habitat protection. Has Manitoba Hydro had any discussion with Province of Manitoba with respect to implementation of this Policy regarding Golden-winged Warbler? What was the outcome?

RESPONSE:

Manitoba Hydro is aware of the Proposed *Species at Risk Act Policy on Critical Habitat Protection on Non-federal Land*, and has engaged both the Province of Manitoba and Federal Government on potential project effects on Golden-winged warbler.

Details of our efforts and discussions with the government to protect critical habitat for Golden-winged Warbler was presented in response to Question #EC/MH-003 (attached to response CEC-IR-049).

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.5**

QUESTION:

No targeted surveys were conducted for Eastern Tiger Salamanders (Endangered) even though this species occurs in the RAA. Surveys conducted for other amphibian species are unlikely to be effective. For example, unlike Northern Leopard Frog, tiger salamanders overwinter underground rather than in ponds.

How were the potential impacts on Eastern Tiger Salamanders assessed and mitigated without knowledge of their distribution, habitat use, and abundance in the study area?

RESPONSE:

The environmental impact statement considered the best available information to assess the potential impact of the project on eastern tiger salamanders. Section 2.5.1.1 and Section 2.5.1.2 of the Wildlife and Wildlife Habitat Technical Data Report include a description of desktop and field studies and a summary of the status of eastern tiger salamander in Manitoba and Canada. As described in the 2013 *COSEWIC Assessment and Status Report on the Eastern Tiger Salamander*, this salamander is only known from six sites in Canada. The amphibian field studies conducted for this environmental impact statement identified what is likely a new site in the tributary of the Rat River, but this site is located greater than 7 km from the proposed project.

MCWS_MH-I-059 and MCWS_MH-I-064 (attached) provide further information on how Manitoba Hydro has considered eastern tiger salamanders in project planning and monitoring.

References:

COSEWIC. 2013. COSEWIC assessment and status report on the Eastern Tiger Salamander *Ambystoma tigrinum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 53 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm)

SUBJECT AREA: **Wildlife and Wildlife Habitat, Biophysical Monitoring**

REFERENCE: **MCWS MMTP IR No 2 - Item 4**

QUESTION:

2.4.2 Reptiles/Amphibians

This plan focuses on riparian areas, and northern leopard frog and snapping turtle habitat. This should include eastern tiger salamanders as well, for reasons explained in our comments on Chapter 22 - Appendix 22C – Section 4.4.1. Eastern tiger salamanders breed in small ponds that do not have fish or snapping turtles. Their biggest threat is dewatering or accidental introduction of fish. Any pond found to have salamander egg masses should be avoided until late summer when the larval salamanders have metamorphosed and left the water. Additional concerns are flooding and ditching that is conducted in such a way that will allow fish to access these sites.

RESPONSE:

Manitoba Hydro does anticipate the need for dewatering of small ponds and is not aware of any mechanism during its normal course of construction or operations by which fish would be accidentally introduced into small ponds. Any work in small ponds would occur under frozen ground conditions with no ditching planned to be conducted during construction or operations. While Manitoba Hydro understands the critical status of the eastern tiger salamander, we believe there is a very low risk of any potential effects during the construction or operation of this Project based on the threats stated above, EIS field studies conducted to date, and the proposed scheduling and timing of construction practices. However, Manitoba Hydro will expand its proposed amphibian monitoring program to include eastern tiger salamander, as outlined in MCWS_MH-I-064. Manitoba Hydro will share any observations of eastern tiger salamander with the Manitoba Conservation Data Centre.

SUBJECT AREA: **Environmental Protection, Follow-up and Monitoring, Biophysical Monitoring**

REFERENCE: **MCWS MMTP IR No 2 - Item 4**

QUESTION:

4.4.1 Amphibians

This plan only proposes to monitor for northern leopard frogs. The prairie population of this species is listed federally largely because of declines in Alberta and western Saskatchewan. We have not listed them provincially under The Endangered Species and Ecosystems Act because they appear to be abundant and widespread throughout most of Manitoba, with the possible exception of the southwestern corner of the province. A much bigger concern in this study area is the eastern tiger salamander. Southeastern Manitoba is the only place left in Canada where they have not yet been extirpated. Manitoba Conservation and Water Stewardship personnel are currently conducting surveys for this species and it is likely that this species will be listed provincially in the near future. This plan must include an eastern tiger salamanders monitoring component. Please note that this will require a minimum 2 years of baseline survey data to be collected prior to the construction period.

RESPONSE:

Manitoba Hydro is committed to conducting surveys and a monitoring plan for northern leopard frogs to ensure cooperation and compliance with the Federal *Species at Risk Act*. However, in light of recommendations provided here by Manitoba Conservation and Water Stewardship, Manitoba Hydro will expand this northern leopard frog monitoring program to also include eastern tiger salamanders. These surveys will consist of visual encounter surveys at suitable wetland sites. In total, two years of baseline data will be collected prior to construction.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.5**

QUESTION:

Water quality sampling was conducted for frogs even though there were no anticipated changes in water quality (p 9-120).

How will water quality data be used for monitoring effects on amphibians?

RESPONSE:

Wetland monitoring, including water quality data collection, helped characterize baseline habitat conditions and identity sensitive sites at permanent and semi-permanent ponds used by amphibians. Water quality information was collected as part of a larger suite of biophysical data collected to better characterize existing conditions of the Project area, including the water quality of waterways such as creeks, drains and wetlands. As described in the environmental monitoring plan (Appendix 22C), wildlife and wildlife habitat monitoring will include variety of survey techniques to understand potential effects to amphibians, including water quality sampling.

Manitoba Hydro does not anticipated effects to amphibians due to water quality changes as a result of the Project. During construction, mitigation measures designed to reduce impacts to water quality and wetlands will be implemented, including an Erosion Protection and Sediment Control Plan. Further information can be found in the Construction Environmental Protection Plan (Appendix 22A).

Through the application of adaptive management, Manitoba Hydro is committed to the continual improvement of the draft Environmental Monitoring Program (Appendix 22C). The program's objectives, techniques, and methods will be continually improved based on information acquired through the environmental licensing process, public hearings, and current or ongoing Manitoba Hydro monitoring efforts in other parts of Manitoba.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.5**

QUESTION:

There is no discussion about the probability of occurrence of Mottled Duskywing (an Endangered butterfly) in the RAA, its habitat, or potential effects. What are the expected impacts of the project on Mottled Duskywing?

RESPONSE:

Mottled duskywing (*Erynnis martialis*) is discussed in Section 9.4.2 of the Wildlife and Wildlife Habitat Chapter and Section 2.6.2.1 of the Wildlife and Wildlife Habitat Technical Data Report. Mottled duskywing observations are from pine woodlands located more than 10 km east of the Final Preferred Route (COSEWIC 2012; MB CDC 2014).

As part of project planning, Manitoba Hydro worked to reduce project effects on wildlife, including mottled duskywing, by routing west of the Sandilands Provincial Forest. On this basis, the Project is not anticipated to have an effect on mottled duskywing.

References:

COSEWIC. 2012. COSEWIC assessment and status report on the Mottled Duskywing Erynnis martialis in Canada [online]. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 35 pp. Available from http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_hesperie_tachetee_mottled_duskywing_1213_e.pdf

MB CDC (Manitoba Conservation Data Centre). 2014. Historical records and species and plant database [online]. Available from http://www.gov.mb.ca/conservation/cdc.

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.5**

QUESTION:

There is very little discussion on the effects of the project on Moose populations even though Moose are declining in southeastern Manitoba and there is First Nations interest in the species. The only mention in the environmental effects assessment (p9-68 to 9-101) refer to the positive effects of increased browse with little discussion of how the project might contribute to recovery or further decline. Please elaborate on the expected impacts on important Moose habitat such as calving, aquatic feeding and wintering areas as well as population impacts related to increased hunting, better access for predators, and increased White-tailed Deer populations.

RESPONSE:

According to Manitoba Sustainable Development, moose have been considered rare or very uncommon in southeast Manitoba (GHA 35A and GHA 35) since a major population collapse in the 1990s (Chapter 9 of the EIS and Section 2.3.1.2.3 of Wildlife and Wildlife Habitat – Technical Data Report). Factors contributing to their collapse include predation by wolves, parasites (e.g., brainworm), fire suppression, and unregulated harvest. Manitoba Sustainable Development is not actively managing for the recovery of moose populations in or around the project area (i.e., no protected status, no hunting conservation closures, disease management programs, access management, predator management, research, etc.) like they are in other parts of the Province (Province of Manitoba 2015). Only two sets of moose tracks were encountered during wide-ranging aerial and ground surveys conducted in the project area over multiple years.

Given the very low density of moose in southeast Manitoba and the widespread extent of existing threats to moose, it is unlikely that the Project will have incremental effects on their population.

References:

Province of Manitoba. 2015. Province advises additional moose hunting closures in west-central Manitoba. 2015. Media Bulletin - Manitoba. http://news.gov.mb.ca/news/index.html?item=36459

SUBJECT AREA: **Wildlife and Wildlife Habitat, None**

REFERENCE: **Chapter 9, Section 9.5**

QUESTION:

The access management plan (p. 9-11) will be applied for construction and operation but will do little to restrict access to the public. Increased use by ATVs and snow machines leading to increased hunting pressure and disturbance to wildlife is likely, and much of the line is on private land where options for access control are limited.

Please elaborate on the potentially significant residual effects of increased human access.

RESPONSE:

The Access Management Plan has a multitude of options for access control on private and crown lands as described on pg 20-21 of Chapter 22 Appendix 22B. As the Project Development Area has a mixture of ownership including Manitoba Hydro, Private and the Crown these options have the ability to restrict access where the respective landowners on their lands deem access restrictions are required. Manitoba Hydro is prepared to assist private landowners or the Crown in the implementation of these control measures to mitigate access related concerns. Access control measures have been implemented by Manitoba Hydro and landowners on the Bipole III and Lake Winnipeg East System Improvement Projects.

As stated in the Wildlife section (9.5.3.3.2), the Project will result in a 1.3% increase in fragmentation in the RAA. Most of the areas traversed by the new ROW are heavily fragmented by agriculture and development such as roads and highways. The potential for the Project to increase access to remote areas is limited to two forested areas south of the Watson P. Davidson WMA and wildlife mortality risk may increase in these areas. The effect of increased access was assessed as being not significant because it would not affect the long-term persistence or viability of wildlife populations; diminish the potential for or prolong threats to

species recovery that are contrary or inconsistent with federal recovery strategy or action plans; or diminish the capacity of critical habitat to provide for the recovery or survival of wildlife at risk.

SUBJECT AREA: **Vegetation and Wetlands, None**

REFERENCE: **Chapter 10, Section 10.3**

QUESTION:

The assessment of landscape intactness focused on vegetation patches greater than 200 ha (p. 10-21).

What are the impacts of fragmentation of smaller patches of vegetation?

RESPONSE:

Assessment of landscape intactness focused on vegetation patches larger than 200 ha based on Government of Canada (2013) guidance that these are critical for supporting biodiversity, especially with respect to certain wildlife species that require large patches of interior forest habitat. Smaller patches typically have lesser amounts of interior habitat (if any), and as such, fragmentation itself has little effect on the quality of the remaining habitat; instead the impact is better measured as habitat loss (Fahrig 2017), which has been assessed as change in native vegetation cover class abundance, distribution, and structure (Section 10.5.3).

References:

Fahrig, L. 2017. Ecological responses to habitat fragmentation *per se.* Evolution and Systematics 48 (in press).

Government of Canada. 2013. How Much Habitat is Enough? Third Edition. Environment Canada, Toronto, Ontario. Available at: http://www.ec.gc.ca/nature/E33B007C-5C69-4980-8F7B-3AD02B030D8C/894_How_much_habitat_is_enough_E_WEB_05.pdf.

SUBJECT AREA: **Vegetation and Wetlands, None**

REFERENCE: **Chapter 10, Section 10.3**

QUESTION:

The vegetation classification system included only 24 classes (Table 10-1), resulting in the loss of some ecologically significant distinctions. For example, only three forest classes were recognized (coniferous, deciduous, and mixed).

Why was this level of vegetation classification employed rather than the Forest Ecosystem Classification for Manitoba or equivalent?

RESPONSE:

Two data sets were primarily used in the evaluation of habitat and landcover classes - the Forest Resource Inventory (FRI) and the Federal Landcover Cover Class information. The FRI provides information on species composition, site class, age class and crown closure. The FRI polygons were also delineated at a large scale (1:15,840). The FEC information, although informative for ground cover and ecosite information, does not provide the necessary information to be used for the habitat models. There is also no complete FEC database for the Province of Manitoba. The FRI classes that were displayed on the maps in the TDRs and EIS were also generalized for communicative purposes. The FRI provides greater detail than that which was grouped into the generalized categories found on the maps.

The LCC data provided the evaluation team with information on the different crop types. This is the only dataset with crop type information and that is why it was utilized.

SUBJECT AREA: **Vegetation Management, None**

REFERENCE: **Chapter 10, Section 10.3**

QUESTION:

It is unclear how widely herbicides will be used. The Integrated Vegetation Management Plan (Chapter 22) suggests that herbicides will be used along with other treatments but the proposed extent of use is vague. Please provide an overview of the vegetation management program and details on how extensively herbicides will be used. In addition, how will species such as spreading dogbane and milkweed, as members of the natural vegetation community that will be encountered along the route, be addressed? These and other native species are also listed under The Noxious Weed Act.

RESPONSE:

An overview of the vegetation management program is explained in CEC-IR-059_Attachment. Manitoba Hydro cannot predict how extensively herbicides will be used for MMTP at this time. Manitoba Hydro will be developing an Integrated Vegetation Management Plan that considers a variety of factors including existing vegetation, vegetation response to clearing activities, habitat management plans (please refer to CEC-IR-050), land use, and identification of sensitive sites.

Manitoba Hydro understands the importance of milkweed to the Monarch Butterfly and will only implement control measures, as per the *Noxious Weeds Act*, if there's an economic or environmental impact to adjacent landowners. In addition, under the *Noxious Weeds Act*, Manitoba Hydro may be directed to implement control measures. Manitoba Hydro is obligated under the *Noxious Weeds Act* to control/destroy weeds, such as dogbane, as listed by regulation. The control/destroying of noxious weeds may require different methods depending on species, density, and location. Control/destroy methods may include mechanical methods such mowing, or chemical methods such as back-pack selective herbicide application.

Transmission Line & Transmission Station

VEGETATION MANAGEMENT PRACTICES

Manitoba Hydro

In operating and maintaining its major transmission line system Manitoba Hydro must manage the vegetation that grows under the transmission lines and in the transmission stations. This publication has been prepared to provide background information and a general understanding of Manitoba Hydro's transmission line system vegetation management practices.

Does Manitoba Hydro Have A Vegetation Control Policy?

Vegetation control practices fall within Manitoba Hydro's responsibilities to build, operate and maintain transmission line facilities that provide a reliable supply of electricity while being safe to the public and respectful of the environment. Manitoba Hydro must take steps to prevent trees from growing to a height where they could interfere with the reliable operation of a transmission line; impede access to crews to do maintenance and repairs; create a fire hazard; or create an unsafe condition to people or the environment. Keeping transformer station yards in a weed free condition is also part of this ongoing responsibility.

Manitoba Hydro's Environmental Management Policy states....

Manitoba Hydro is committed to protecting the environment. In full recognition of the fact that Corporate facilities and activities affect the environment, Manitoba Hydro integrates environmentally responsible practices into its business, thereby:

- Preventing or minimizing any adverse impacts, including pollution, on the environment, and enhancing positive impacts;
- Meeting or surpassing regulatory requirements and other commitments;
- Considering the interests and utilizing the knowledge of customers, employees, communities, and stakeholders who may be affected by Manitoba Hydro's actions;
- Reviewing our environmental objectives and targets annually to ensure improvement in environmental performance;
- Continually improving the Environmental Management System;
- Documenting and reporting activities and environmental performance.

All measures to control tree growth on transmission lines and weed growth in transmission stations are implemented with full respect for these environmental policies.

Before a transmission line (115 000 volts and higher) is constructed and operated Manitoba Hydro conducts a detailed site selection and environmental assessment (SSEA) study. The SSEA process includes a comprehensive public involvement program to ensure input from communities, landowners, and other stakeholders with an interest in the project. The SSEA process is designed to study and document the environment within which the line is to be located. It also assesses and documents potential impacts associated with constructing and operating the transmission line. Through the identification of these potential impacts measures can be prescribed to avoid, reduce, eliminate or compensate for impacts incurred when

the line is constructed and operated. The SSEA will also consider impacts associated with line clearing and right-of-way maintenance including the need for future tree control programs. The SSEA results are documented in an Environmental Impact Statement which is used to support an application to Regulatory authorities for environmental approval(s) to build and operate the transmission line or transmission station.

Why Does Manitoba Hydro Need Vegetation Management Practices?

Transmission Lines

Before a transmission line can be built and operated Manitoba Hydro must first clear the tree growth from the right-of-way. The voltage of the transmission line and the type of structure used determine the width of the right-of-way and the width of clearing required. Transmission line rights-of-way are typically cleared to a width of 40 - 60 meters using tracked dozer type equipment. ***Manitoba Hydro does not use herbicides to clear new rights-of-way before building the lines.***

The root system of the cleared deciduous trees (those that lose their leaves in the fall) will send up suckers or re-growth in the first spring following clearing operations. Physical disturbance of the surface layers during right-of-way clearing and line construction also causes seeds from the cones of cleared spruce, pine and tamarack trees to become embedded in soil where they may germinate new seedlings. If not controlled, tree suckers and seedlings will grow to a size and density where they would be a physical barrier affecting the ability to access the right-of-way to do line inspection, maintenance and repairs and could eventually grow to a height where they become a very serious threat to the safe, reliable operation of the transmission line. This situation poses hazards to people, property, forests, customers and the transmission line itself. Manitoba Hydro cannot allow trees to grow to a size and density where they become a threat to line operation, line reliability or public safety. Vegetation control is practiced periodically throughout the life of a transmission line to prevent this from happening.

Transmission Stations

Manitoba Hydro designs its transmission station facilities as level, well drained, stone-surfaced and fenced industrial sites. Specific design criteria for buildings and grounds maintenance procedures must be met when operating and maintaining transmission stations. These ensure Manitoba Hydro meets or exceeds safety, station grounding and operational requirements. Weed control is important as weeds may contribute to:

- poor drainage conditions
- altered electrical grounding of the station
- fire hazard situations in the spring and fall
- hazardous conditions for workers who require well drained and dry surface material to maximize electrical safety when working around live wires and energized equipment
- reducing the ability for trucks and heavy equipment to move around the station yard
- the general unsightliness of the facility
- non-compliance with provincial Noxious Weed Act

Most other utilities around the world have concluded, after many years of implementing programs to control weed growth in and around transformer station yards, proper herbicide applications offer the only effective method to control weeds which grow in all transmission station yards. Other methods including hand weeding, hand cultivation, weed blankets, hot steam and biological control methods, have proven to be non-practical and/or ineffective.

What Is A Vegetation Control Cycle?

Transmission Lines

A "vegetation control cycle" is the period of time between implementing consecutive vegetation / tree control programs on a transmission line right-of-way. Most electrical utilities have an objective of making this time period as long as possible to reduce costs and impact on the environment. Any transmission line right-of-way will see many vegetation control cycles during its period of operation (50+ years). The length of a control cycle will depend on the tree species being controlled and the methods being used to control the species. Some methods have a short cycle time but are more effective and desirable for controlling very young tree suckers while others can have a longer cycle if trees can be allowed to grow taller before they are controlled. Experience shows that throughout the life of any transmission line it will be necessary to use a number of tree control methods on a right-of-way. Combinations of methods in successive years can also be effective in lengthening the control cycle.

Several methods are available to Manitoba Hydro for controlling tree growth (suckers & saplings) on power line rights-of-way. These range from mechanical removal – to hand cutting – to broadcast and selective spraying of tree re-growth with herbicides – to selective herbicide treatments to individual stems and stumps – to doing nothing where desirable vegetation has occupied the right-of-way.

As described and illustrated in Drawing # 1 (inside back cover) the vegetation control cycle for a particular transmission line really starts in the first spring following the initial right-of-way clearing for line construction. It is in this first spring that the roots of the cleared deciduous trees and shrubs start to send up suckers or re-growth. Profuse and dense suckering will always occur after cutting down deciduous species like birch, poplar, elm, aspen, ash, willow, maple, oak, willow, maple, cranberry, saskatoon, chokecherry, alder, willow and dogwood. Many of the ground cover plants including herbs, sedges and grasses will also begin to re-occupy the right-of-way at this time.

During clearing and construction activities, which typically occur under frozen ground conditions, the heavy equipment working on the right-of-way will physically crush seed cones releasing spruce, pine and tamarack seeds which may also germinate in this first summer following clearing of the right-of-way.

By the end of the first summer, particularly in areas where deciduous trees were initially cleared, there will be sucker growth that reaches 1-2 meters in height. The sucker growth tends to be very thick and can be mixed with pioneer plant species like Fireweed. It is typically after the second summer, for a new line, that Manitoba Hydro will conduct its first line patrol to document where there is prolific re-growth of deciduous trees. After a few summers following line construction the coniferous species are only very small seedlings hidden in the overgrowth of suckering trees and pioneer plants species such as Fireweed and grasses/sedges. This is the time when right-of-way managers plan for the future vegetation control needs of the line.

The vegetation re-growth information will be used to plan for the first vegetation / tree control program for the transmission line right-of-way. This is the start of the vegetation control cycle. The first vegetation control cycle is complete only when a tree control program is implemented, results monitored and a second tree control program planned. Vegetation management must be continuous for the life of the transmission line.

Transmission Stations

Undertaking vegetation control programs in all transmission station yards is also critical. The control cycle begins with conducting an annual weed control survey in each transformer station yard to document the weed problems present. This information is then used to plan actions to remove the weed problem. The specific control actions may be implemented almost immediately or may be planned for implementation in the following year. In many stations it is necessary to undertake some weed control annually using herbicide products approved for controlling weeds in these types of facilities.

Who is responsible for the tree control programs on transmission line rights-of-way?

Manitoba Hydro does vegetation control on both the distribution system (lower voltage lines supplying customers) and transmission system. This document primarily addresses the transmission system.

The responsibility of maintaining the transmission system lies with the Transmission Line Construction & Line Maintenance Division of Manitoba Hydro's Transmission & Distribution Business Unit. Within the Division the responsibility for vegetation control on transmission lines falls within the responsibilities of the Transmission Line Maintenance Managers – North & South. These two groups are responsible for the day to day maintenance of all the transmission lines within their assigned geographical area. This organizational group is most knowledgeable of the lines themselves and the terrain crossed and is properly equipped to access all portions of the lines at any time of year.

Manitoba Hydro's Forestry Section staff is available to the Division to provide supporting expertise and advice related to a variety of tree control methodologies including non-herbicide and herbicide methods. This group maintains good knowledge and expertise related to tree control methods and equipment and the herbicide products used on Manitoba Hydro property. The Forestry Section obtains the necessary provincial authorizations (Pesticide Use Permits) required in accordance with the Pesticide Use Permit Regulation of the Manitoba Pesticide & Fertilizer Control Act. This group must also submit to Manitoba Conservation "Post Seasonal Reports" in accordance with this same regulation. The Forestry Section also ensures all those in direct supervision of staff applying herbicides on Manitoba Hydro's transmission lines and transmission stations are properly licensed in Manitoba to conduct this type of work.

What methods are used to control tree growth on rights-of-way?

Mechanical Clearing Methods

a.) Winter Shearing

Currently the most extensively used tree control method on northern transmission line rights-of-way is the Winter Shearing method (Figure 1). There has not been any large scale northern transmission line herbicide use since 1990. The Winter Shearing method is used only in the winter months and involves wide-track crawler tractors equipped with a front mounted V-Blade traversing back and forth along right-of-way sections to shear off the woody growth at the frozen ground surface. Some northern rights-of-way have seen 2 & 3 control cycles using this method. The advantages of this method include:

- the work is done during frozen conditions on rights-of-way which could not be easily accessed during non-frozen ground conditions

- the method is more economical on a cost per hectare basis (Figure 2) than other methods which could only be practiced during summer months (e.g., herbicide control, mowing)
- with good productivity rates (e.g., hectares per hour) the method allows for a large number of hectares of tree re-growth to be controlled in a single season using a small labor force
- the method allows for a longer period of time between treatments (5-12 years depending on location and site conditions)
- results are immediate
- work is done in winter months when there is less wildlife use of the rights-of-way

The sheared material is generally pushed into windrows as the crawler tractors move back & forth along the right-of-way. The material left on the right-of-way will settle down onto the soil surface after snow melt and will decompose to return organic material to the soil. The method however does not reduce the number of hectares of deciduous tree re-growth requiring re-treatment over time because the sheared trees will sucker back. In areas of spruce or pine re-growth only, this method does result in a long control cycle by removing trees until such time that seeds from these species again germinate on the right-of-way.

Figure 1: Northern Transmission Line Tree Control History 1990 - 2002

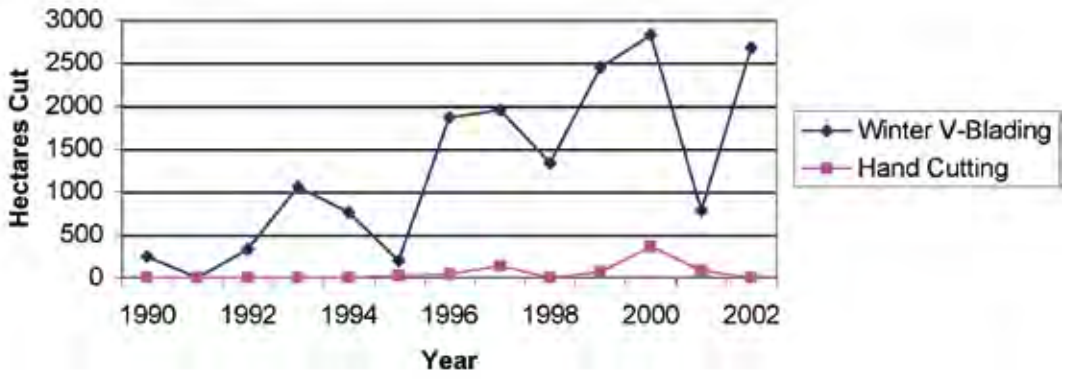
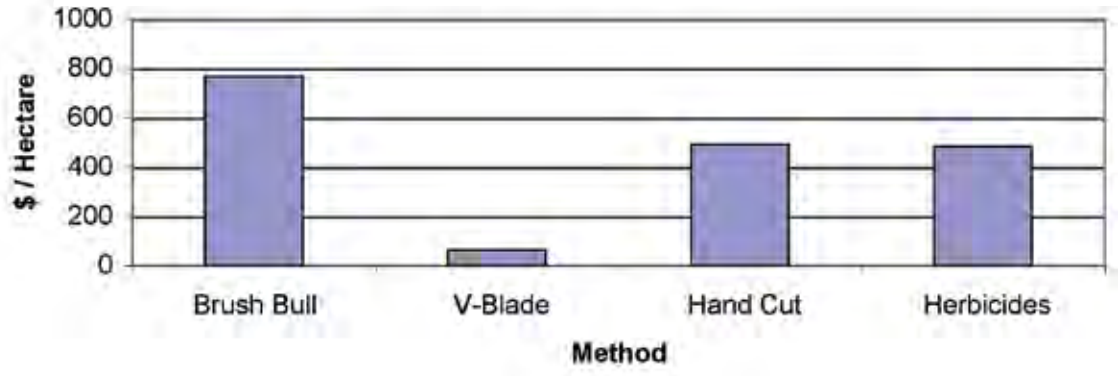


Figure 2: Cost Comparison Of Northern Transmission Line Tree Control Methods

(Herbicidle Costs are For Southern Transmission Line Work)



b.) Mowing (Brush Bulls / Mulchers)

Tree re-growth on rights-of-way can be mowed using rubber tired or tracked tractor units equipped with a special mower head or flail type cutting head. Typically these units can mow a 6 -8 foot (2.5 – 3m) swath as they move along the right-of-way. This type of equipment is used where larger re-growth is present. The equipment is designed to chip or grind the woody material into smaller pieces which are dispersed behind the cutting unit as it works. The woody material will settle on the ground surface and eventually decompose adding organics to the soil. These units are typically only used where summer access is possible and do not work well under snow cover conditions.

As with the winter shearing these units do not eliminate the deciduous tree re-growth. The deciduous tree roots will continue to sucker back onto the right-of-way and repeat cycles are required every 5-7 years.

c.) Hand Cutting

Hand cutting involves the use of brush saws and/or chainsaws to cut down tree re-growth and to remove tall danger trees along right-of-way edges. This method is labor intensive and it's use by the remoteness of many transmission lines. To work in remote areas with this method on a large scale would require aerial support and temporary or mobile work camps and support systems. Hand cutting on transmission lines is typically done in small and sensitive areas like river bank buffers and park areas. It is also done periodically to control individual tall trees that are close to interfering with transmission line operation and safety. This method is used frequently on small areas during line patrols. Hand cutting tends to be a very costly method to remove large areas of tree re-growth occurring on transmission line rights-of-way.

Herbicide Treatments

Throughout North America there are many well accepted herbicide control products and methods for transmission line rights-of-way. Herbicides are a very effective tool which a right-of-way manager can integrate with several other tree control methods over a long period of time. Herbicides provide a tool to effectively strive for development of stable plant communities on the rights-of-way. Stable plant communities have very long periods of "do nothing" between control cycles. There are several herbicide methods currently available to Manitoba Hydro as follows:

a.) Broadcast Ground Spraying

In using this method, specially designed rubber-tired or tracked herbicide spray units traverse back and forth along the right-of-way to deposit large droplets of a solution of water and herbicide product over the leaves of the tree re-growth. The herbicide solution is delivered through a specially designed spray nozzle that produces large droplets that do not easily drift off target. Broadcast spraying is typically done in areas of dense young (1-2m tall) tree growth covering the entire right-of-way width and then only when trees are actively growing and when the weather conditions allow safe application of the herbicide solution.

b.) Selective Handgun Spraying

In selective handgun spraying a solution of water and herbicide is delivered to target trees through a hand operated spray gun . This method is very effective in that the operator can direct the herbicide solution at the undesirable species while avoiding, where possible, desirable low shrubs and other plant species. This promotes growth of desirable species on the right-of-way as the unsprayed plants will continue to grow and thrive. These plants will then compete against trees for nutrients and growing space and thusly help to reduce the return of undesirable tree species onto the right-of-way. This method is widely used with other tree control methods to move toward establishing stable plant communities on rights-of-way.

c.) Basal Bark Sprays

In this method a spray solution is carefully directed to the lower portion of the stem of target tree species. The method can be used when the tree is actively growing or when it is dormant for the winter. The method is highly selective and works well to remove small pockets of low density deciduous tree re-growth. In this method a solution of oil and herbicide is typically used.

d.) Stem Injections

This is a very selective herbicide application method where herbicide is injected into the bark of an individual tree. This method works well in areas such as river crossing buffers which are typically very sensitive to broadcast herbicide application. The herbicide stays within the individual tree stem and is not released to the surrounding environment. Because of the highly selective application method its use is more common in small areas with a few stems to be treated or where one may not want to use hand cutting or mechanical cutting methods.

e.) Stump Treatments

This method involves the application of a herbicide solution to a recently cut deciduous tree stump. It will prevent the tree roots from sending up "suckers" and thusly provides long term control. This method works well in conjunction with hand cutting of small areas. It also works well where it has been necessary to return many times to small areas to re-cut trees growing back in the area. It also works well in small areas which are difficult and costly to access repeatedly. As the method is used on individual stumps it is highly selective in what is controlled.

Biological Control

Manitoba Hydro has funded some research into biological control but does not yet have proven methods that are known to work on our rights-of-way. It is very apparent a carefully prescribed tree control program, will over time, encourage the growth of desirable species on rights-of-way which will then act as a form of biological control. This makes it hard for a tree species that have been removed to seed back onto a right-of-way. Natural competition from other plants is a form of biological control.

Danger Tree Removal

Manitoba Hydro must monitor all transmission line rights-of-way edges for trees that may fall onto the lines. These trees are called "danger trees". They are typically removed during line patrols using chainsaws. Occasionally where transmission lines are located on rights-of-way where the initial clearing widths were minimized it is necessary after several years to conduct a widening of the right-of-way using hand cutting methods.

g.) Tree Trimming

Tree trimming is required on transmission line rights-of-way where taller trees are allowed to remain under or adjacent to the lines for aesthetic or environmental reasons. These situations typically occur in cities, towns and in specific locations within provincial or federal parks. Tree trimming on energized transmission lines is done exclusively by Manitoba Hydro staff who are fully qualified to work in and around energized transmission lines. Special electrical knowledge and training is required to work around energized circuits. Tree trimming also requires special equipment, tree trimming skills and knowledge to work on tall trees. Tree trimming contractors who have certified utility arborists on the crews are however often used on lower voltage distribution lines.

How does Manitoba Hydro choose which method to use?

When prescribing tree control practices for transmission lines several factors must be carefully considered. Consideration of the volume of work or length of line to be treated; vehicle access limitations; environmental sensitivities; the species, growth stage and size of the tree problem (age/height/density); workload planning; timing; contract versus in-house options; and finally costs involved are all important factors. Several of the methods described in the previous section may be used during the life of a transmission line to control tree growth.

A "one method only" approach to any line will not work well over the long term due to the wide variety of terrain and environmental conditions that exist on and adjacent to transmission lines. For example, if a winter shearing program is prescribed to control tree re-growth on a section of high voltage transmission line right-of-way it will also be necessary to prescribe other methods and approaches to control tree growth in smaller sensitive areas or segments within the overall line section. In such cases there could be several stream and river crossing with sensitive riparian areas where winter shearing would not be used. In these situations chainsaw hand clearing followed by a herbicides applied to the freshly cut stumps may be prescribed. The two prescriptions may not happen at the same time depending on the situation, location, timing and workload priorities.

There are many situations and circumstances where herbicides are not an option for controlling tree growth on portions of transmission lines. In some cases the Manitoba Environment Act License issued for the line prohibits their use and in others Manitoba Hydro will decide that given the location and situation at hand herbicides cannot be used (e.g., trees are too tall, herbicides are not suitable in the local environment or the species present, herbicide use will present a risk to adjacent land use, timing is wrong, costs are too high, and right-of-way access in summer time is not available).

In making a decision on what method to use, all of the tree control methods described earlier, which are well accepted in the industry, are available as options to be considered for the problem at hand. The objective is to prescribe a method or combination of methods that provide acceptable tree control at a reasonable cost while trying to achieve a long tree control cycle and ultimately a stable plant community on the right-of-way.

Why are chemicals called herbicides used?

Herbicide application, when properly prescribed and applied, is recognized as an accepted and effective method to control tree growth. There are Federally approved & registered products specifically designed for right-of-way tree control situations. The Province of Manitoba also decides which herbicide products can be used in Manitoba and under what conditions they may be used. The Province also sets guidelines for the rates at which products may be used; how they may be applied; when they may be applied; and where they may not be used. Direct supervisors of herbicide applicators working for Manitoba Hydro on Manitoba Hydro rights-of-way must be trained and licensed by the Province before applying herbicides to rights-of-way. In point of fact most applicators themselves are also licensed by Manitoba.

Manitoba Hydro must also apply each year to Manitoba Conservation for "Pesticide Use Permits" issued under the Manitoba Environment Act before any herbicide program is implemented. Manitoba Hydro must also provide a "Post Seasonal Report" to Manitoba Conservation by year end. This report provides specific information on the work that was done including the herbicide products used, the quantities used of each product, the locations where each product's was applied, the name of the applicator(s) and other information as required by the Province. These Regulatory requirements of Canada and Manitoba are in place to ensure only approved herbicides are used safely and properly.

How does Manitoba Hydro notify the public of its proposed vegetation control programs?

Herbicide Programs

Manitoba Hydro's Forestry Section inititiates public notifications related to proposed herbicide applications to rights-of-way and transmission stations in accordance with requirements of the Provincial Pesticide Use Permit Regulation and in accordance with Manitoba Hydro's internal public notification policies.

The Provincial Pesticide Use Permit process requires Manitoba Hydro apply for a pesticide use permit issued by Manitoba Conservation. In making this application Manitoba Hydro must identify which pesticide (i.e.; herbicide) products are intended to be used; where they are intended to be used; the equipment/methodology to be used; and which Provincially Licensed Applicators will be applying the pesticide. The Regulation also requires the public be notified when an application for a Pesticide Use Permit has been made. To achieve this Manitoba Hydro will typically place advertisements in the Winnipeg Free Press and/or local newspaper in the vicinity of where the work is to be completed. Manitoba Hydro will also contact landowners with property adjacent to the right of way that is to be treated with a herbicide to inform them of the proposed work and to address concerns related to carrying out the program adjacent to their land. This would also include contacting First Nations should herbicide use be proposed on Reserve Lands.

Non-herbicide Programs

When non-herbicide tree control work is to occur on private property it is Manitoba Hydro's policy to contact the landowner prior to entering the property to do the work. For work that is to occur on First Nations Reserve lands Manitoba Hydro would, in advance of the program, contact the Chief & Council of the affected First Nation. Where work is to be done on rights-of-way crossing Crown lands Manitoba Hydro must obtain a Work Permit from Manitoba Conservation prior to work beginning.

What has been the history of northern herbicide use since 1990?

There are over 4200 kilometers of transmission lines in northern Manitoba to be monitored annually for tree re-growth problems. The last transmission line spraying of significance on a northern transmission line occurred in 1990 on a 230 kV transmission line running between Flin Flon and The Pas. Instead of using herbicides, right-of-way vegetation managers treat approximately 2000 hectares of right-of-way each winter using hand cutting, mechanical mowing and winter shearing methods to control tree re-growth.

Since 1985 the use of herbicides on northern transmission lines has diminished to where only very small sections of transmission rights-of-way have recently been treated with herbicide. These involved application of herbicide to woody growth in and around tower bases to allow annual monitoring of tower footing movement and to highly selective individual stem treatments on small sections of rights-of-way.

Since 1985 Manitoba Hydro has, in its overall use of herbicides, significantly reduced the amount of active ingredient (ai) used per treated hectare of right-of-way or station yard (Figure 3 & 4). A review of Post Seasonal Control Reports since 1985 confirms that since 1991 tree control programs using herbicide products have been, for the most part, on the distribution lines (66 kilovolt & lower lines) and not on transmission lines (115 kilovolt & higher lines). Although Figure 5 shows a slightly increasing trend in the amount of area treated annually with herbicides to control tree re-growth this trend is exclusively due to increased use of herbicides on the distribution system. The trend of increasing hectares of weed control each year is largely due to recent acquisition of Centra Gas and Winnipeg Hydro. Manitoba Hydro has also, since 1985, significantly reduced the use of soil residual herbicide products. This trend is confirmed

in Figure 6. Herbicide products used by Manitoba Hydro today are much more selective in the species they control and have minimal soil residue lingering into the next growing season.

Although aircraft are still commonly used elsewhere in North America to apply herbicides, Manitoba Hydro does not use aircraft to apply herbicides to rights-of-way and has no plans to re-introduce the method in the foreseeable future. Manitoba Hydro does however remain current with respect to various application methodologies and equipment available in the industry and will assess its suitability for Manitoba Hydro's right-of-way situations.

With the exception of the North Central Project (because of specific conditions of its Environment Act Licence prohibiting herbicide use on the project) herbicides are used in all transmission stations in northern Manitoba. Manitoba Hydro makes use of herbicide products to control weeds in transmission stations which are effective but do not have long term soil residual properties (i.e.: where herbicide effects on plants can be seen into the second growing season). Additionally Manitoba Hydro has, since 1985, significantly reduced the active herbicide ingredient applied per hectare annually in station weed control programs.

Figure 3: Tree Control Herbicide Programs
(Transmission & Distribution Lines Combined)
Active Ingredient Use 1985 - 2002

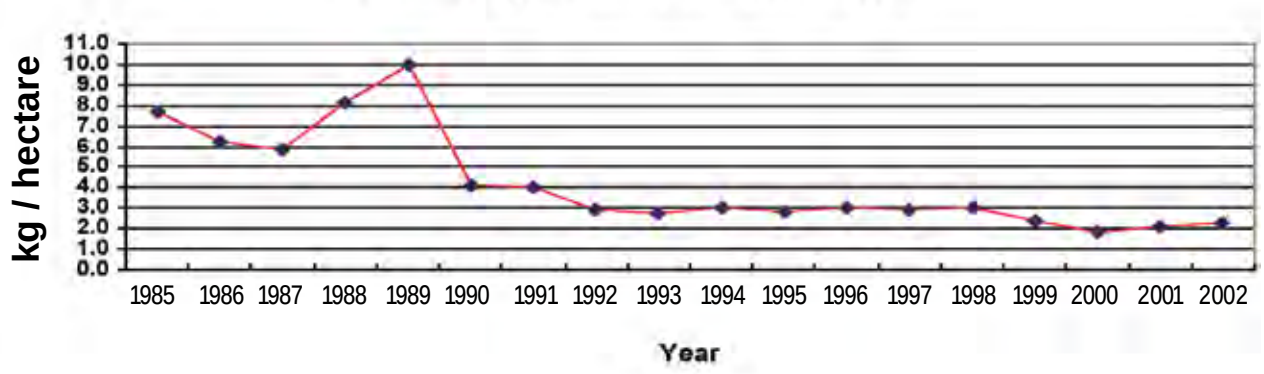


Figure 4: Station Weed Control Herbicide Programs
(Transmission & Distribution Combined)
Active Ingredient Use 1985 - 2002

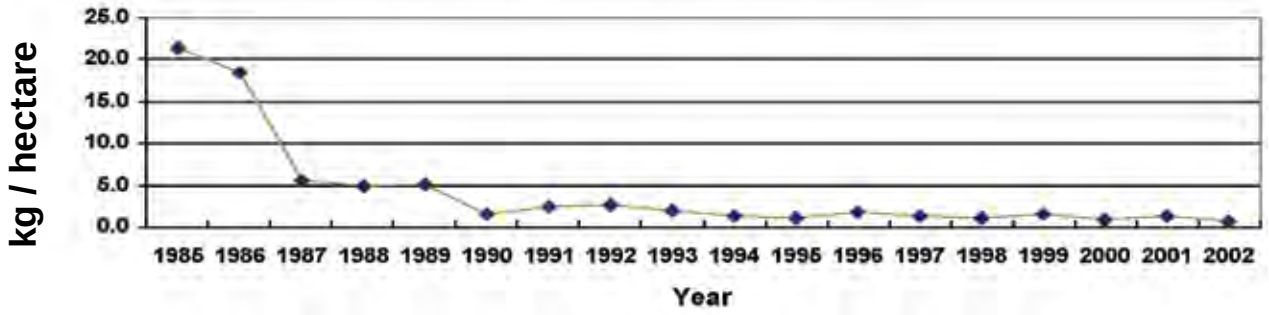
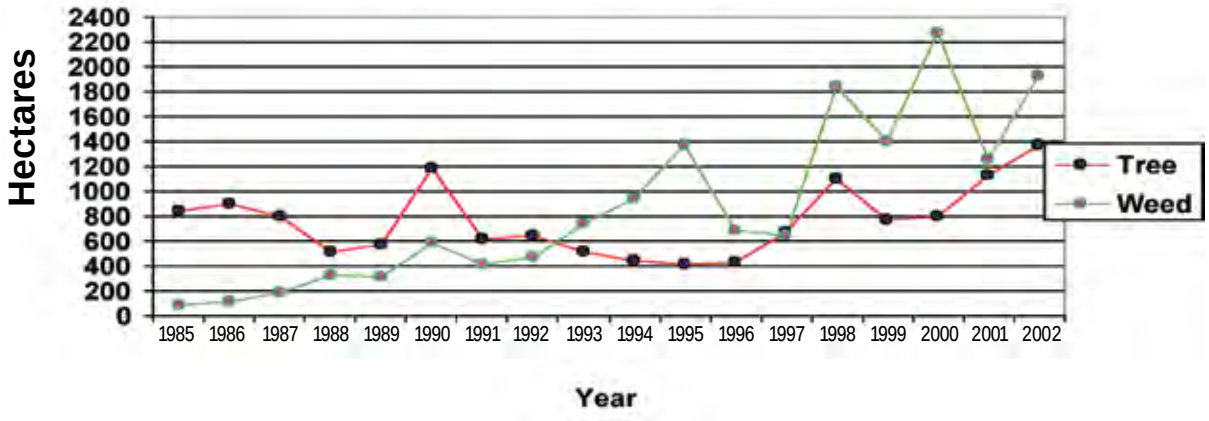


Figure 5: Tree & Weed Control Herbicide Programs
(Transmission & Distribution Combined)
Area Treated 1985 - 2002



Drawing #1 — Vegetation Control Cycle

Step 1

"RIGHT-OF-WAY CLEARING"

Trees on the Transmission line right-of-way are cleared to allow line construction and operation

Step 2

"RIGHT-OF-WAY RECOVERY FROM TREE CLEARING"

In the spring of the first summer following right-of-way clearing the roots of the deciduous trees and shrubs start to send up suckers. The pioneer plants species (herbs/forbs/grasses/sedges) start to grow back within the Right-of-way. Seeds released from crushed pine and spruce seed cones may germinate and grow under the suckers and other plants now growing on the right-of-way

Step 3

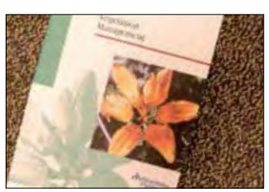
"DOCUMENT TREE RE-GROWTH"

After two growing seasons following the clearing of the right-of-way the first transmission line patrol is completed to monitor & document tree re-growth occurring on the new right-of-way. This survey will document those locations (recorded by span #'s) along the right-of-way with deciduous tree suckering now present

Step 4

"A VEGETATION MANAGEMENT PLAN"

The line patrol information is analyzed and compiled to develop a long term plan and approach, including budget estimates, scheduling information and a prescription for method(s) that could be used for controlling the tree re-growth



Step 5

"PLAN FOR IMPLEMENTATION"

The Vegetation Management Plan is further refined where more detailed plans are developed including:

- assignment of dollars to the tree control program
- confirming the method(s) to be used to control the tree re-growth
- finalizing work schedules
- obtaining all necessary regulatory approvals prior to work being started
- preparing contract specifications where required
- selection & awarding of Contract(s)/ organizing of MH work crews

Step 6

"IMPLEMENT TREE CONTROL PROGRAM(S)"

Conduct of the tree control program(s) on the right-of-way

Step 7

"ASSESS RESULTS"

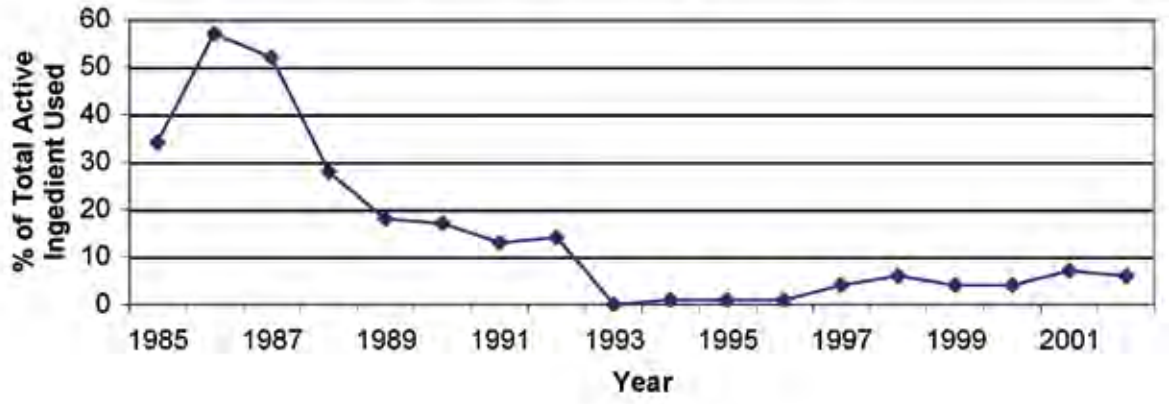
Patrol the work areas to assess effectiveness of control methods and to develop plans to correct deficiencies

Step 8

"DOCUMENT TREE RE-GROWTH"

Two years after the previous tree control work conduct another line patrol to document and map the locations and extent of tree growth problems on the right-of-way

Figure 6: Residual Herbicide Use Expressed As A Percent Of Total Active Ingredient Use



In Closing…

Tree and weed control responsibilities required to operate and maintain transmission lines and transformer stations are taken very seriously at Manitoba Hydro. This work must be carried out periodically on all transmission lines and transmission stations. However Manitoba Hydro also takes its environmental stewardship policies very seriously when prescribing methods and conducting any work to control tree and weed growth on transmission facilities. In this way the environment can be protected as the work is being done.

Manitoba Hydro

820 Taylor Avenue
P.O. Box 815
Winnipeg, MB
R3C 2P4
Telephone: (204) 474-4060
Fax: (204) 475-0273

SUBJECT AREA: **Vegetation and Wetlands, None**

REFERENCE: **Chapter 10, Section 10.5**

QUESTION:

Clearing the ROW will result in the permanent loss of 12% of the forest cover in the LAA (Table 10-15). The magnitude of this effect is ranked as "low" because no native vegetation classes will be lost in the LAA.

What is the rationale for characterizing a 12% loss of forest cover as "low"?

RESPONSE:

To the best of our knowledge there are no rare or uncommon forest classes known in the LAA. In the past, Manitoba listed native vegetation communities that were considered rare in the province. However, the Manitoba Conservation and Water Stewardship Wildlife Branch is revising these communities of conservation concern (see EIS 10.4.3), so they are no longer listed by the Manitoba Conservation Data Centre (Friesen 2014 pers. Comm.). The anticipated 12% loss of forest cover in the LAA was rated low because the affected forest cover classes are common in the LAA and no single forest cover class (i.e., deciduous forest, mixedwood forest, coniferous forest) will be lost from the LAA as a result of the Project. Forest cover loss will occur largely on the New ROW in an 80 m to 100 m wide strip over a length of 121 km of the Project ROW resulting in 522 ha or approximately 2 sections of forest cover loss throughout the new ROW.

Reference:

Friesen, C. 2014. Biodiversity Information Manager. MBCDC, Winnipeg Manitoba. Contacted by Glenda Samuelson, Business Centre Discipline Lead, Stantec Consulting Ltd, Regina, Saskatchewan. September 3, 2014.