

# Lake Winnipeg East System Improvement Transmission Project Environmental Effects Monitoring Report



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List of Revisions

<b>Number</b>	<b>Nature of revision</b>	<b>Section(s)</b>	<b>Revised by</b>	<b>Date</b>
1	Corrected camera trap survey results for moose	10.1	MH	10/01/2019
2	Corrected camera trap survey results for white-tailed deer	10.2	MH	10/01/2019
3	Corrected camera trap survey results for wolves	10.3	MH	10/01/2019

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## Abbreviations

ac	Alternating Current
EA	Environmental Assessment
EEMP	Environmental Effects Monitoring Plan
EPIMS	Environmental Protection Information Management System
EPP	Environmental Protection Program
GPS	Geographic Positioning System
km	kilometre
LWESI	Lake Winnipeg East System Improvement
kV	kilovolt
m	metres
PR	Provincial Road
ROW	Right-of-Way
SD	Sustainable Development

## 1 INTRODUCTION

This report presents the results of the environmental effects monitoring plan for the Lake Winnipeg East System Improvement (LWESI) Transmission Project, hereby known as “the Project”. This report is produced in compliance with clause 43 of *The Environment Act* licence No. 3210. Manitoba Hydro presents this information to inform stakeholders and the general public on progress made on construction and implementation of mitigation measures that minimize environmental effects.

This is the Project’s third annual monitoring report and describes construction progress from April 1, 2017 through March 31, 2018, but also includes some more recent monitoring results. Map 1 outlines the Lake Winnipeg East System Improvement Transmission Project area. Anyone interested in further information about this report or the Project is invited to contact Manitoba Hydro at:

Licensing and Environmental Assessment  
360 Portage Avenue (5),  
Winnipeg MB R3C 0G8  
1-877-343-1631 or 204-360-7888

## 2 PROJECT OVERVIEW

The Lake Winnipeg East System Improvement Transmission Project involves the construction and operation of a new 75km 115 kV transmission line from the Town of Powerview-Pine Falls to Manigotagan Corner Station, a new 115-66 kV transmission station west of the intersection of Provincial Road (PR) 304 and Rice River Road, and modifications to the existing Pine Falls Generating Station Switchyard.

## 3 PROJECT STATUS

Construction of the Project began in August 2015. The project officially came into service on June 30<sup>th</sup>, 2018.

### 3.1 Pine Falls Generating Station Switchyard Modifications

Improvements to the Pine Falls Generating Station switchyard were required to accommodate the Project. Staging and outage coordination activities are completed including relay building modifications, cable trench extensions, breaker replacements zone box installation and the installation of a new bus conductor.

### 3.2 115-66kv Transmission Station

The new 115-66kv switching station near Manigotagan accepts power from the generating station via a new 75 km transmission line. Station construction was completed in April 2018.

### 3.3 115 kV Transmission Line

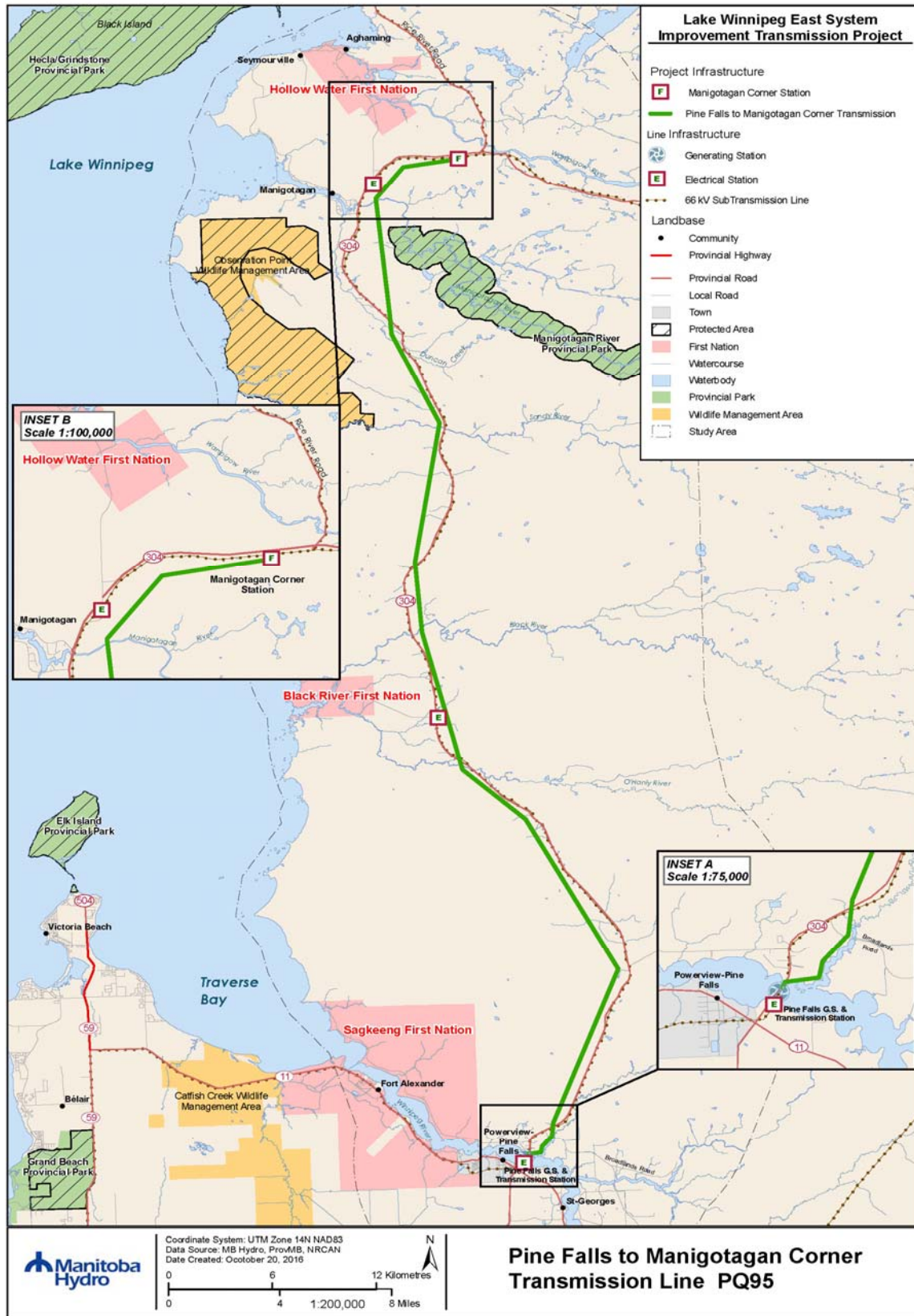
Clearing of the 60 meter ROW (right of way) was conducted in the winter 2015/16 in joint ventures with Sagkeeng First Nation, Black River First Nation, Hollow Water First Nation and electrical utility contractors. Tower assembly was conducted in 2016/17 in joint ventures with the same communities. Foundation construction and tower erection were completed in spring 2017. Transmission line stringing was completed in February 2018.



**Photo 1: Construction crews used helicopters to install conductors in 2017/18**



**Photo 2: Final tower construction was completed in 2017/18**



Map 1: Lake Winnipeg East System Improvement Transmission Project Area



## 2017/18 Environmental Effects Monitoring Highlights

Key monitoring highlights during this reporting period described in further detail in this document include:

- Surveys identified that most vegetation species of conservation concern were in good condition with some potentially benefitting from the right-of-way clearing activities as a result of additional sunlight and reduced competition afforded to herbaceous plants.
- Plants and plant communities important to Indigenous peoples appeared to be thriving in most areas.
- Plant species important to Indigenous peoples for food or medicine appeared to be having an excellent year for fruiting with blueberry and cranberry species fruiting profusely within the transmission line ROW.
- Aquatic plant species including sweetflag (Weekay), wild rice and sessile-fruited arrowhead were all observed to be in good condition with abundant flowering or fruiting.
- Willow cuttings were planted at locations where the transmission line crosses PTH 304 to enhance the visual barrier afforded by woody vegetation. Results from follow-up surveys indicate that planting survival was very low. Timing of planting, and hot dry weather likely prevented better survival. Follow up monitoring is planned for spring of 2019.
- Bird-wire collision monitoring was conducted at all major river crossings. Six bird collisions were identified across eight days of intensive surveys. These results indicate a very low rate of bird-wire collisions and signify the effectiveness of bird diverter mitigation.
- An aerial survey was conducted in the project area for moose, white-tailed deer, and wolves. 94 moose, nine white-tailed deer and two wolves were detected during the three day survey.
- With the support of Manitoba Hydro, a GPS wolf study has been ongoing within and neighbouring the Project study area by a PhD candidate from Memorial University. Preliminary information from a PhD study on wolf movements in the region indicates that wolves have avoided the Project area, to date, therefore limiting the likelihood of increased moose predation as a result of the Project.

## 4 ENVIRONMENTAL EFFECTS MONITORING PLAN OVERVIEW

Manitoba Hydro's commitment to environmental protection includes the development of a comprehensive Environmental Protection Program (EPP) for the Project. This includes monitoring and follow-up of biophysical environmental components identified in the environmental assessment. The Environmental Effects Monitoring Plan (EEMP) was approved by the Department of Sustainable Development (SD) on August 9<sup>th</sup>, 2016, and outlines the various monitoring activities that will occur during the different phases of the Project.

The scope of this plan includes physical and biological components of the environment. The purpose of the EEMP is to identify the key activities that will be conducted as part of the monitoring and follow-up component of the Environmental Protection Program that will verify potential effects and effectiveness of mitigation.

The objectives of the EEMP are to:

- Confirm the nature and magnitude of predicted environmental effects as stated in the environmental assessment (EA);

- Assess the effectiveness of mitigation measures implemented;
- Identify unexpected environmental effects of the Project, if they occur;
- Identify mitigation measures to address unanticipated environmental effects, if required;
- Confirm compliance with regulatory requirements; and
- Provide baseline information to evaluate long-term changes or trends.

Environmental components requiring follow-up monitoring are discussed further in this annual Environmental Effects Monitoring Report include:

- Aquatics;
- Vegetation;
- Birds;
- Mammals; and
- Access

## Adaptive Management

Manitoba Hydro has accumulated a wealth of knowledge and lessons learned from previous monitoring programs. The successes of those programs have been useful in developing the EEMP for the Project. This previous experience has been used to improve upon the plan's approach, methods and key environmental monitoring activities.

Going forward, an adaptive management framework will continue to be used to deal with unexpected outcomes or events based on monitoring information gathered. Data will be reviewed as collected to determine if any of the environmental thresholds specified in the EEMP have been exceeded due to shortfalls in impact prediction, ineffective mitigation measures or inadequate monitoring approaches. Actions will be developed in response to these contingencies.

## 5 IMPLEMENTATION OF MONITORING AND FOLLOW-UP ACTIVITIES

Environmental monitoring helps validate the accuracy of the environmental assessment and effectiveness of mitigation measures. Manitoba Hydro utilizes internal staff for the implementation of the EEMP, funded participation of Indigenous community representatives, and retained highly qualified specialists in appropriate disciplines. Manitoba Hydro's Environmental Protection Information Management System (EPIMS) will also play a major role in managing the EEMP implementation, coordination of field work, data collection and communications amongst the monitoring team.

### Environmental Inspection Staff

Reporting to a Senior Manitoba Hydro Environmental Assessment Officer, an on-site construction Environmental Inspector was retained and trained for the 2017/18 transmission line construction season. In addition, Manitoba Hydro's Licensing and Environmental Assessment Department provided advice and guidance to environmental inspectors on all conditions outlined in the *Environment Act* licence.

### Community Involvement

In addition to providing employment and business opportunities through the Project, Manitoba Hydro is committed to engaging local community-based environmental expertise during the construction of the Project. In 2017/18, Manitoba Hydro approached affected First Nation communities to request they recommend interested individuals from their community to work as community representatives for the Project.

This community representative position provided an opportunity for an individual from Sagkeeng First Nation to perform site visits and observe ongoing construction activities. The community representative was trained in environmental protection procedures, equipment and inspection documentation. Environmentally sensitive sites were evaluated for proper signage and identification and

mitigation measure compliance (Photo 3 and 4). The community representative served as both environmental monitor and community liaison. As a community liaison he kept community leadership informed on the status of construction activities through daily reporting and also informed the Manitoba Hydro construction supervisor of any community related concerns.

### Data Management

As the Project's EEMP requires and generates large amounts of data, the EPIMS was developed to manage, store and facilitate the transfer of Environmental Protection Program data and information amongst the Project team. The EPIMS will facilitate the transfer of knowledge and experiences encountered on a daily basis during construction activities from environmental inspectors and community environmental monitors to specialists that are responsible for monitoring project effects on a real time basis. As well, monitoring results and mitigation measure adaptations will be communicated back to construction staff and contractors.



**Photo 3: Environmental protection signage installed to assist construction crews**



**Photo 4: Access trail monitoring is continuing after decommissioning**

<b>Table 1: 2017/18 Monitoring Activities by Environmental Component</b>		
<b>Component</b>	<b>Environmental Indicator</b>	<b>2017/18 Monitoring Status</b>
Aquatics	Condition of Watercourse and Banks	Completed
Vegetation	Vegetation Species of Conservation Concern	Plant survey conducted
	Plants and Plant Communities important to Aboriginal peoples	Plant survey conducted
	Rehabilitation	Plant survey conducted
	Invasive and Non-Native Species	Plant survey conducted
Birds	Stick Nests	None identified within the Project right-of-way
	Bird Collision and Bird Diverter Monitoring	Conducted in spring and autumn 2018
	Bird Species of Conservation Concern	Completed
Mammals	Moose	Aerial and ground surveys conducted
	White-tailed Deer	Aerial and ground surveys conducted
	Wolves	Aerial and ground surveys conducted
Access	Humans on ROW	Human access survey ongoing

## 6 ENVIRONMENTAL COMPONENT MONITORING

Multiple environmental components were identified for follow-up in the environmental assessment and technical reports. For each environmental component, one or more environmental indicators were selected to focus monitoring and follow-up efforts as indicated in the EEMP (Table 1). Map 2 shows an overview of monitoring site locations.

## 7 AQUATICS

The potential effect of the Project on aquatics was a component of the environmental assessment. One of the main risks to existing fish habitat from transmission line construction is damage to stream banks and riparian vegetation leading to loss of cover and in-stream sediment delivery. In recognition of this, mitigation measures such as buffers were prescribed to protect streams and habitat. The monitoring program for this component was focused on evaluating the effectiveness of mitigation at stream crossings and prescribing any remedial actions. Final site visits were conducted in 2017 from a helicopter and ground surveys. All sites were in compliance with no additional mitigation required. The final report was completed in 2016/17. No aquatics related surveys were conducted in 2017/18.



**Photo 5:** A small creek south of the Sandy River showing the preservation of the riparian zone and regrowth of vegetation along the ROW

## 8 VEGETATION

Vegetative change can be an important indicator of environmental effects of the Project.

### 8.1 Species of Conservation Concern

Surveys conducted from July 24-27, 2018 at seven plots identified that most species of conservation concern (SCC) were in good condition with some potentially benefiting from the right-of-way clearing activities as a result of additional sunlight and reduced competition afforded to herbaceous plants.

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, some loss of habitat has occurred for rare and uncommon plants within the Project area, including some elm and ash species. However the habitat changes have been confined to the Project right-of-way and station site. Dwarf bilberry (*Vaccinium caespitosum*) has still not reemerged at one site where it was previously found on the ROW. The re-appearance of Dwarf Bilberry may require several years.

*Assess the effectiveness of mitigation measures implemented:*

With the exception of dwarf bilberry, which could not be relocated at one site, mitigation measures have ensured that vegetation at Environmentally Sensitive Sites is in good condition following construction.

*Identify unexpected environmental effects of the Project, if they occur:*

With the exception of dwarf bilberry, which could not be relocated at one site, no unexpected environmental effects have been observed.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

To date, none required.

*Confirm compliance with regulatory requirements:*

Compliance with regulatory requirements continues.

*Provide baseline information to evaluate long-term changes or trends:*

Survey information will contribute to evaluating long-term changes or trends in SCC in this Project area.



**Photo 6: Herbaceous vegetation regrowth on the ROW**

## **8.2 Plants and Plant communities important to Indigenous Peoples**

Surveys conducted July 24-27, 2018 at 17 plots identified that most species of importance to Indigenous peoples appeared to be thriving in the Project ROW.

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, some loss of habitat has occurred for plants important to Indigenous peoples within the Project area. However many species were having an excellent year for fruiting with blueberry and cranberry species fruiting profusely within the right-of-way. Aquatic plant species including sweetflag (weekay), wild rice and sessile-fruited arrowhead were all observed to be in good condition with abundant flowering or fruiting.

*Assess the effectiveness of mitigation measures implemented:*

In general, due in part to the effectiveness of mitigation measures and suitable moisture conditions plants in surveyed plots appeared to be in good and healthy condition.

*Identify unexpected environmental effects of the Project, if they occur:*

Despite the removal of mulch material, the re-appearance of dwarf bilberry at one survey site has not occurred as expected. Depending on future moisture conditions this plot may require a few more years to reestablish.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

To date, none required.

*Confirm compliance with regulatory requirements:*

Compliance with regulatory requirements continues.

*Provide baseline information to evaluate long-term changes or trends:*

Survey information will contribute to evaluating long-term changes or trends in plants important to Indigenous peoples in this Project area.



**Photo 7: Monitoring plot with healthy, fruit-bearing plants within the ROW**

### 8.3 Invasive and Non Native Plants

Surveys were conducted in July 2018 at key locations along the ROW. White sweet clover (*Melilotus albus*) and Canada thistle (*Cirsium arvense*) continue to be the two most prevalent non-native and invasive species within the right of way.

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, Project construction had minimal effect on the spread of invasive species. Non-native or invasive plants were observed along some portions of the transmission line, typically close to PTH 304, but these species were very likely present prior to the clearing of vegetation and have since benefitted from the reduction in tree and shrub cover. These species continue to be found only within upland areas with wetland communities largely free of these species.

*Assess the effectiveness of mitigation measures implemented:*

Mitigation actions in the construction Environmental Protection Plan to limit the exposure of mineral soils by clearing equipment appeared to be at least partially successful. The periodic regrowth of tree and shrub cover will naturally suppress these species in the future.

*Identify unexpected environmental effects of the Project, if they occur:*

No unexpected environmental effects have been observed.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

Manitoba Hydro and its contractors will continue to apply a clean equipment protocol to limit the spread of these species.

*Provide baseline information to evaluate long-term changes or trends:*

Survey information will contribute to evaluating long-term changes or trends in invasive plants in this Project area.



**Photo 8: Highway crossing with encroaching white sweet clover**

## 9 BIRDS

### 9.1 Bird-Wire Collision Monitoring

The presence of transmission lines in proximity to areas of high bird activity may lead to bird – wire collisions. Manitoba Hydro installed bird diverters along transmission line sections that transect areas of high bird activity. Pre-construction surveys identified sensitive sites for birds, which were used to select locations for bird diverters. Bird-wire collision monitoring was conducted in the spring and autumn of 2018, after the project was completed.

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, some bird-wire collisions were anticipated as a result of the Project. It was also predicted that although some individual birds may collide with wires, otherwise healthy populations are not expected to be affected. Monitoring surveys have confirmed that bird-wire collision rates are well below North American averages, and healthy populations have not been affected.

*Assess the effectiveness of mitigation measures implemented:*

Mitigation efforts, including Project routing and installation of bird diverters appear to be effective.

*Identify unexpected environmental effects of the Project, if they occur:*

No unexpected environmental effects have been observed.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

To date, none required.

*Confirm compliance with regulatory requirements;*

Compliance with regulatory requirements continues.

*Provide baseline information to evaluate long-term changes or trends:*

Survey information will contribute to broader and long-term trends in bird-wire collisions across Manitoba Hydro infrastructure.



**Photo 10:** Canada geese migrating over the transmission line. Bird diverter devices were installed in areas of high bird activity.



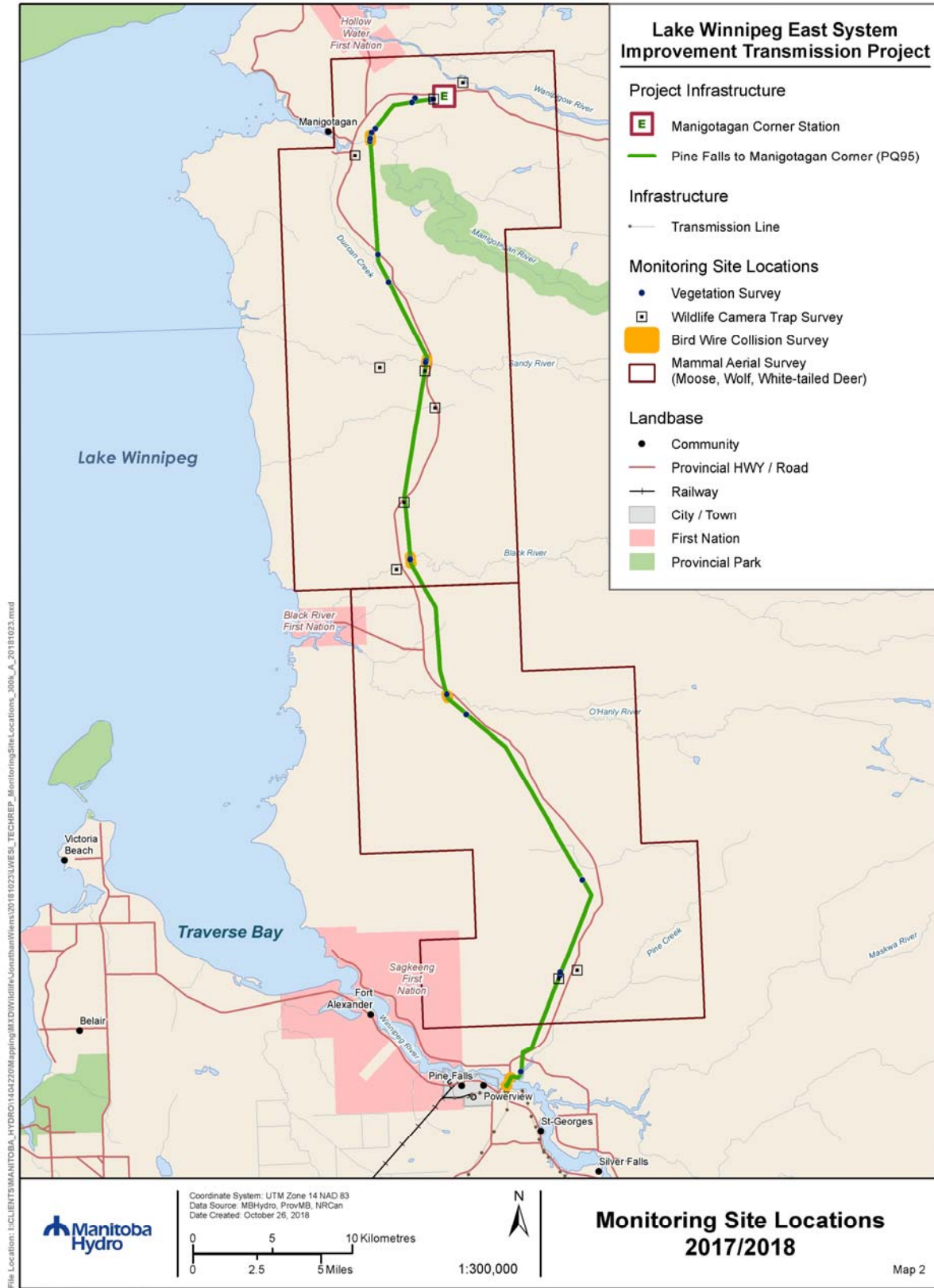
**Photo 9:** Biologist conducting a bird-wire collision survey along the right of way

## 9.2 Stick Nests

An aerial stick nest search was conducted by an experienced biologist prior to Project clearing in 2015. No stick nests were detected and therefore no additional mitigation or monitoring was required.

## 9.3 Bird Species of Conservation Concern

Bird species of conservation concern monitoring is complete and was reported on in the 2016/17 annual report.



Map 2: Lake Winnipeg East System Improvement Transmission Project Monitoring Site Locations

## 10 MAMMALS

The potential effect of the Project on mammals was the focus of the environmental assessment especially for moose (*Alces alces*), wolves (*Canis lupus*), and white-tailed deer (*Odocoileus virginianus*). All species occur within the Lake Winnipeg East System Improvement Transmission Project study area.

The overall objectives of the mammals monitoring program are to expand baseline knowledge, ensure compliance with regulatory requirements and environmental report commitments, monitor and measure mammal responses to ROW creation, and assess the success of mitigation measures. The EEMP outlines the species-specific monitoring commitments for moose, wolves, and white-tailed deer.

### 10.1 Moose

Manitoba Hydro conducted an intensive aerial ungulate survey of the Project area from February 11-14, 2018. 47 survey blocks were identified ('3 minute grid' - 3.5km x 5.5km) that intersect a five kilometer buffer of the LWESI right-of-way. These survey blocks were derived from the same spatial grid Manitoba Sustainable Development utilizes in conducting Gassaway-style moose population surveys in Game Hunting Area 26.

A Bell 206 Jet Ranger helicopter was used to fly a 500 m spacing intensive grid survey at a 122 m altitude with an average air speed of 100km/hr. Pre-loaded GPS flight lines ensured complete coverage on a east to west orientation. Two experienced observers recorded observations of moose, white-tailed deer, wolves, and tracks of moose, deer, wolves and snowmobiles.

A total of 94 moose were detected during the survey with the bull:cow:calf ratio of 35:40:19. 7.5% of the cows had twins. This equates to an average density of approximately 10 moose/100 km<sup>2</sup>. A reduced number of moose were detected in 2018 than 2017, but numbers were similar to 2016.

Moose appeared to have an uneven distribution in the survey area, but were generally found in higher numbers to the east of the Project area.

The average distance of moose to the ROW was 3,914 m, a small increase from 3,753 m in 2017, but similar to 3,915 m detected in 2016. Average distance to Provincial Trunk Highway 304 was 3,483 m, also a small increase from 3,093 m in 2017 but similar to 3,525 m detected in 2016. Approximately 25% of moose exhibited moderate hair loss due to winter tick.

Although 2017/18 was the final year for aerial surveys, an additional year of monitoring will be added to the survey schedule. This change is being made as a part of adaptive management to account for delays in the construction schedule and variation in survey results. The additional survey will help in understanding changes in moose distribution and provide some inferences on changes in relative abundance of both moose and white-tailed deer.

Early results from the camera trap survey have shown the presence of moose occurring at 4 of 5 ROW monitoring sites and 4 of 5 control monitoring sites over an average 158 trap days in 2017/18. When data was pooled, there was no significant difference between the number of moose detected on the ROW monitoring sites versus the control monitoring sites (p-value = 0.0867). A larger sample size in future years to allow for more fulsome analysis.

No moose were killed or injured as part of the Project activities and no moose carcasses or evidence of moose mortalities were identified by construction crews in 2017/18. In addition bird, vegetation, mammals monitoring crews did not find any evidence of moose mortalities while conducting their field activities.

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, some habitat loss and alteration has occurred as a result of the Project. However the changes have been confined to the Project right-of-way and station site. When considering the data collected as part of multiyear aerial surveys, there has been little evidence that moose have avoided the Project area. No Project related moose mortalities due to vehicle collisions or other sources have been reported by environmental inspectors or construction crews.

Preliminary information from a PhD study on wolf movements in the region indicates that wolves have avoided the Project area, to date, therefore limiting the likelihood of increased moose predation as a result of the Project.

*Assess the effectiveness of mitigation measures implemented:*

Mitigation efforts, including Project routing, vegetation buffers, access management, and construction timing windows appear to have been effective.

*Identify unexpected environmental effects of the Project, if they occur:*

No unexpected environmental effects have been observed.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

To date, none required.

*Confirm compliance with regulatory requirements:*

Compliance with regulatory requirements continues.

*Provide baseline information to evaluate long-term changes or trends:*

This monitoring will help in understanding changes in moose distribution and provide some inferences on changes in relative abundance of both moose and white-tailed deer in the Project area.





**Photo 11: Moose detected in a camera trap**

## 10.2 White-tailed Deer

Manitoba Hydro conducted an intensive aerial ungulate survey of the Project area from February 11-14, 2018. 47 survey blocks were identified ('3 minute grid' – 3.5km x 5.5km) that intersect a five kilometer buffer of the LWESI right-of-way. These survey blocks were derived from the same spatial grid Manitoba Sustainable Development utilizes in conducting Gassaway-style moose population surveys in Game Hunting Area 26.

A Bell 206 Jet Ranger helicopter was used to fly a 500 m spacing intensive grid survey at a 122 m altitude with an average air speed of 100km/hr. Pre-loaded GPS flight lines ensured complete coverage on a east to west orientation. Two experienced observers recorded observations of moose, white-tailed deer, wolves, and tracks of moose, deer, wolves and snowmobiles.

A total of nine deer were detected in the survey. No deer or deer tracks were detected in the northern portion of the study area.

Early results from the camera trap survey have shown the presence of white-tailed deer occurring at 2 of the 5 ROW monitoring and 2 of the 5 control sites after ~158 trap days in 2017/18. When data was pooled, significantly more deer were detected on the ROW monitoring sites than at control monitoring sites (p-value < 0.001). White-tailed deer were primarily detected in the southern portion of the study area.

No white-tailed deer were killed or injured as part of the Project activities in 2017/18.

The overall low number of white-tailed deer detected during this survey period corresponds to what was detected in previous survey periods. The recent scarcity of deer in this study area has been attributed to severe winters in 2013/14 and 2014/15.

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, some habitat loss and alteration has occurred as a result of the Project. However the changes have been confined to the Project ROW and station site.

*Assess the effectiveness of mitigation measures implemented:*

Mitigation efforts, including Project routing, vegetation buffes, access management, and construction timing windows appear to be effective.

*Identify unexpected environmental effects of the Project, if they occur:*

No unexpected environmental effects have been observed.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

To date, none required.

*Confirm compliance with regulatory requirements;*

Compliance with regulatory requirements continues.

*Provide baseline information to evaluate long-term changes or trends:*

This monitoring will help in understanding changes in white-tailed deer distribution and provide some inferences on changes in relative abundance of both moose and white-tailed deer in the Project area.



**Photo 12: White-tailed deer detected in a camera trap on the right of way near Pine Falls generating station**

### 10.3 Wolves

Early results from the camera trap program have shown that wolves have been detected on 1 of 5 ROW monitoring sites, and 2 of 5 control monitoring sites after ~157 traps days in 2017/18. When data was pooled, significantly more wolves were detected on the control monitoring sites than at ROW monitoring sites (p-value < 0.001).

Two wolves were detected as part of intensive aerial ungulate surveys for moose and white-tailed deer.

Manitoba Hydro has sponsored a Memorial University PhD student who is investigating the movement patterns of wolves along linear features (e.g. highways, gravel roads, trails, transmission lines) in southeastern Manitoba. This multi-year study involves placing GPS collars on wolves and tracking them throughout the year. The results will help Manitoba Hydro understand the extent wolves use linear features, and other natural features to move within their environment.

Early results of this study have shown that all linear features in the study area were selected for by wolves with the exception of transmission ROWs adjacent to a primary road. Among linear features selected for, secondary roads had the highest probability of use, followed by ROWs without an adjacent primary road and waterways.

Transmission ROWs with an adjacent primary road, including the Lake Winnipeg East System Improvement Project were avoided by wolves. The continuation of this multi-year study will help improve our understanding of wolf movements.

No wolves were killed or injured as part of the Project activities in 2017/18. In addition no wolf mortalities were observed by Project staff (i.e. hunter or vehicle collisions).

*Confirm the nature and magnitude of predicted environmental effects as stated in the EA:*

As predicted in the EA, some habitat loss and alteration has occurred as a result of the Project. However the habitat changes have been confined to the Project right-of-way and station site.

*Assess the effectiveness of mitigation measures implemented:*

Mitigation efforts, including Project routing, vegetation buffes, access management, and construction timing windows appear to be effective.

*Identify unexpected environmental effects of the Project, if they occur:*

No unexpected environmental effects have been observed.

*Identify mitigation measures to address unanticipated environmental effects, if required:*

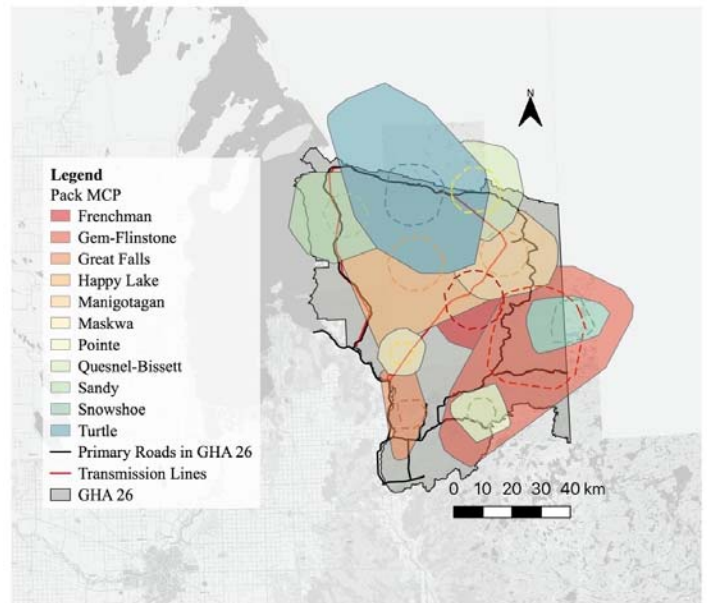
To date, none required.

*Confirm compliance with regulatory requirements;*

Compliance with regulatory requirements continues.

*Provide baseline information to evaluate long-term changes or trends:*

This monitoring will help in understanding changes in wolf distribution and provide some inferences on changes in movements before and after the Project.



**Photo 13: Graduate students from Memorial University are conducting analysis of wolf home range and movements in the Project area**



**Photo 14: Student conducting analysis of wolf den in the Project area**

## Compliance Monitoring Summary 2017/18

- Environmental inspectors were employed by Manitoba Hydro for the Lake Winnipeg East System Improvement Transmission Project to conduct compliance monitoring to ensure mitigation measures outlined in the environmental protection plan, licences, permits and approval were adhered to during construction.
- Construction related activities did not result in any wildlife mortalities.
- Throughout the winter construction season, an environmental inspector conducted daily inspections of all Project sections. Inspection reports indicated there were no major issues and work was in compliance with applicable approvals and permits. Minor spills and rutting were cleaned up and reported to regulators, as required.
- The regional Conservation Officer periodically toured the site with Manitoba Hydro staff to ensure compliance with the Project licence and environmental protection plans.

## 11 ACCESS

In September 2015, Manitoba Hydro began right-of-way access monitoring with camera traps on existing all-weather access trails along the Project area. In May 2016, after the construction season, all camera traps were redeployed along the existing sites as well as four more along the cleared ROW to document the frequency of access along the access road as well as the ROW. These 20 cameras will continue to be maintained in the 2017/18 monitoring period. Analysis of the photos captured has yet to be conducted, but preliminary results indicate low human use. Detailed analysis will assist in documenting change of wildlife and human use of the Project area.

Once the Project was in-service access trail decommissioning was initiated as required by Manitoba Sustainable Development. This involved the placing large boulders, trenching, and felling trees over unnecessary access trails to prevent future vehicular traffic.

## 12 COMPLIANCE MONITORING

Compliance monitoring involves reviewing Project activities for adherence to legislation, licence conditions, permits, and environmental protection plans.

The compliance monitoring program included the use of a dedicated environmental inspector to observe and verify the implementation of all Project related mitigation measures. Community representatives also supported these efforts towards compliance monitoring. Information generated from this program is used within adaptive management to improve both mitigation measure effectiveness and overall monitoring program design.

A Manitoba Sustainable Development Conservation Officer conducted routine inspections of the Project. For the 2017/2018 construction season, no enforcement warnings or notices were issued.

## 13 FUTURE MONITORING

The following monitoring activities are planned for 2018/19. The environmental effects monitoring plan contains detailed descriptions of all monitoring activities. Community representatives from local indigenous communities will continue to be invited to participate and provide input into the monitoring program.

### Aquatics

Stream crossing surveys are now completed.

### Birds

Bird related surveys are now completed.

### Vegetation

Post construction surveys will continue in 2018/19 in accordance with the EEMP. This includes surveys for species of conservation concern, non-native and invasive plants, plants and plant communities important to Indigenous peoples.

### Mammals

Post construction surveys will continue in 2018/19 in accordance with the EEMP. These include camera trap and aerial surveys for moose, white-tailed deer, and wolves.

### Access

Surveys will continue in 2018/19 in accordance with the EEMP. These include camera trap surveys along the Project area, including access points.