# APPENDIX F

# MANITOBA–MINNESOTA TRANSMISSION PROJECT

## ENVIRONMENTAL MONITORING PLAN

## GOLDEN-WINGED WARBLER MONITORING REPORT 2017-2020

Prepared for

Licensing and Environmental Assessment Department

Manitoba Hydro

By

Wildlife Resource Consulting Services MB Inc.

October 2020

SENSITIVE DATA REDACTED

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# STUDY TEAM

Biologists and technicians who designed, participated in, and drafted the survey results included:

- Robert Berger – Design, analysis, surveys, and reporting
- Mark Baschuk – Reporting and mapping
- Kevin McRae – Data collection
- Thomas Wood – Data collection
- Marissa Berard – Data collection

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# INTRODUCTION

The golden-winged warbler (*Vermivora chrysoptera*) is listed as Threatened under the federal *Species at Risk Act* and under *The Endangered Species and Ecosystems Act* of Manitoba. Hybridization and competition with the blue-winged warbler (*Vermivora cyanoptera*) is a primary threat to golden-winged warbler populations (Edie *et al.* 2003; Environment and Climate Change Canada 2016). Other important threats include habitat loss, nest parasitism by the brown-headed cowbird (*Molothrus ater*), and mortality due to collisions with human-made structures (Environment and Climate Change Canada 2016).

The golden-winged warbler is an inhabitant of shrubby or early successional habitats near forest edges (Environment and Climate Change Canada 2016), it can be found in the Project regional assessment area (RAA), as indicated in the *Manitoba–Minnesota Transmission Project Environmental Impact Statement* (Manitoba Hydro 2015). The Manitoba–Minnesota Transmission Project (the Project) right-of-way (ROW) crosses through five critical habitat grid squares that have been delineated by Environment and Climate Change Canada in the Golden-winged Warbler Recovery Strategy (Environment Canada 2014). Right-of-way clearing, which occurred during the winter of 2019/2020 was estimated to affect 475 hectares (ha) of critical golden-winged warbler habitat. Of this, 473 ha are expected to regenerate into shrubby habitat that will likely be suitable for golden-winged warbler. Additionally, vegetation management prescriptions were developed prior to ROW clearing as part of the mitigation strategy, in an attempt to maintain or enhance golden-winged warbler habitat on the ROW (Manitoba Hydro N.D.). As described in the Environmental Monitoring Plan (Manitoba Hydro 2019), pre-construction, construction, and operation monitoring will identify changes in golden-winged warbler habitat and monitor for potential effects on the local golden-winged warbler population.

The objectives of the golden-winged warbler monitoring are to:

- monitor the response of the local golden-winged warbler population along the ROW;
- assess effectiveness of mitigation measures implemented;
- identify unexpected environmental effects of the project, if they occur; and
- identify additional mitigation measures to address unanticipated environmental effects, if required.

This report outlines the findings of two pre-construction monitoring surveys, conducted in 2017 and 2019, and one operation monitoring survey, conducted in 2020.

# METHODS

Golden-winged-warbler surveys were conducted twice prior to Project construction (pre-construction surveys) and once during operation. Pre-construction surveys for golden-winged warbler were conducted from June 8 to 12, 2017, and from June 17 to 19, 2019. Operation surveys were conducted from June 16 to 19, 2020. During all surveys, point counts with and without playback recordings were used to detect golden-winged warbler (Kubel and Yahner 2007). Survey sites were initially identified using a desktop analysis of available remotely-sensed data. Suitable golden-winged warbler habitat was identified in the area that overlaps five golden-winged warbler critical habitat grids that intersect the ROW using a habitat model (Stantec 2015; WRCS 2017a) and verified with high-resolution imagery. Survey sites were selected on the ROW and near the ROW (reference sites), spaced a minimum of 400 m apart, in potential high-quality habitat, that consisted of a mixture of shrubs and grassland near forest edge (Photo 1). The majority of sites were consistently surveyed during all survey years. However, the number of survey sites varied slightly among surveys due to permission access on private land (Table 1). Landowners off the ROW were contacted and permission to access their property was obtained prior to the survey.

**Table 1: Site types and numbers surveyed during the pre-construction surveys (2017 and 2019) and operation (2020) periods**

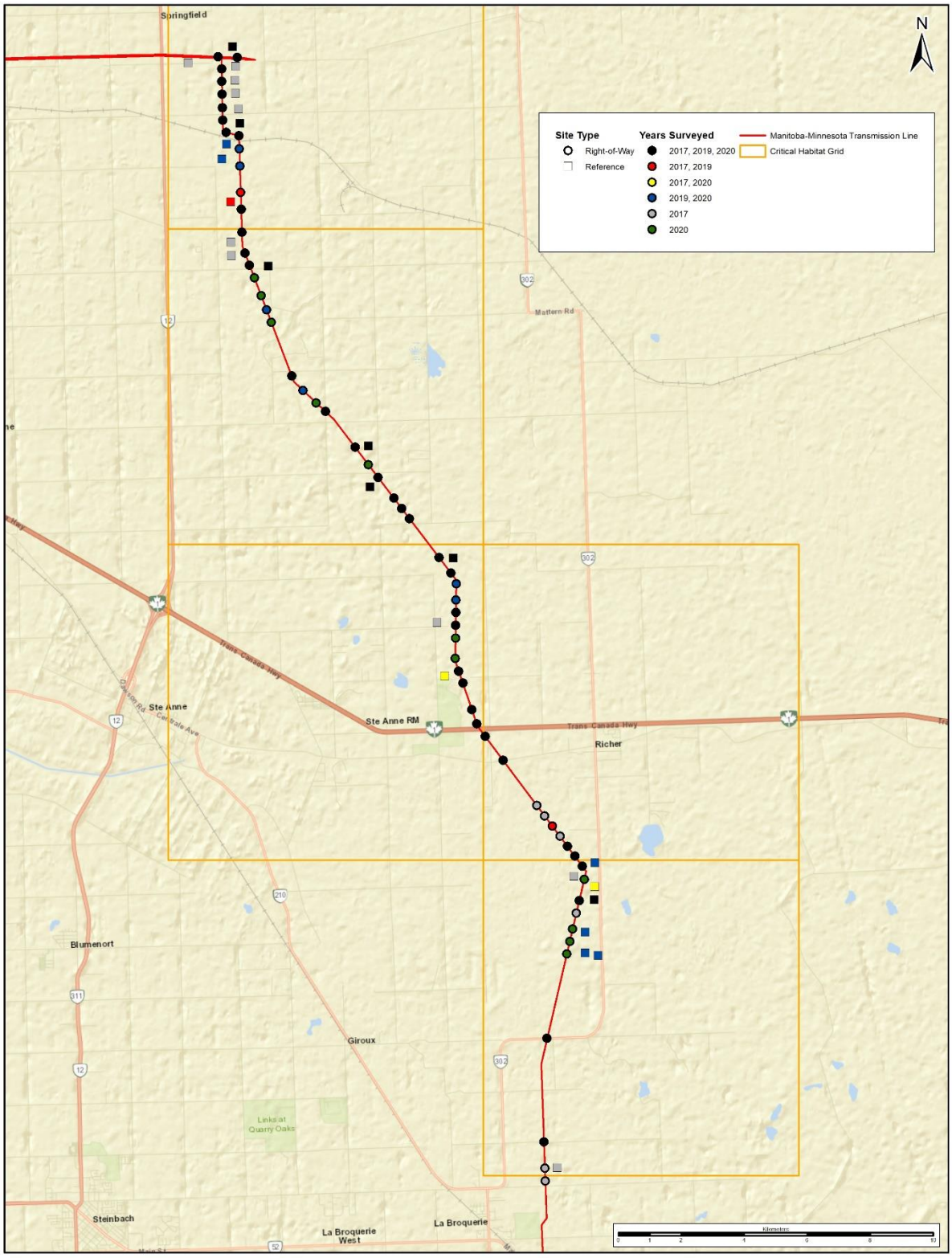
| Year | Site Type | No. Sites Surveyed | Total Sites |
|---|---|---|---|
| **2017** | ROW | 44 | 64 |
| | Reference | 20 | |
| **2019** | ROW | 44 | 58 |
| | Reference | 14 | |
| **2020** | ROW | 53 | 68 |
| | Reference | 15 | |

Surveys were conducted between 5:00 a.m. and 9:30 a.m. At each site surveyors listened for three minutes, played a recording of golden-winged warbler song for five minutes, and then listened for another two minutes. Recordings were played at 100 decibels with an MP3 player and speaker (Photo 2) (Artuso 2009). Broadcasting golden-winged warbler songs were conducted under Species at Risk Permit conditions issued by Manitoba Sustainable Development. All visual and aural detections of golden-winged warbler were noted over the 10-minute period. Incidental observations of other rare bird species were also noted during surveys.

A Fisher's exact test was used to compare the occupancy rates of ROW sites and the reference sites during the pre-construction surveys in 2017 and 2019 to the occupancy rates observed during the post-construction survey in 2020.

**Photo 1: Golden-winged warbler habitat at a reference site, June 2020**


**Photo 2: MP3 player (right) and speaker (left)**




**Map 1: Golden-winged warbler survey sites during the pre-construction (2017 and 2019) and operation (2020) periods**

# RESULTS AND DISCUSSION

Sixteen golden-winged warblers were observed at 13 sites in 2017, 27 were observed at 20 sites in 2019, and 14 were observed at 13 sites in 2020 (Table 2). Additionally, nine golden-winged warblers were observed incidentally in 2017, 28 were observed incidentally in 2019, and 2 were observed incidentally in 2020.

During all survey years most of the detections occurred in the northern portion of the study area, and relatively few were detected south of Highway 1 (Map 2; WRCS 2017b; WRCS 2019), indicating a potentially high abundance of golden-winged warblers and the presence of good-quality habitat in this area.

Many of the sites where golden-winged warblers were observed consistently during the survey years were in the northern portion of the study area. One site supported golden-winged warblers during all three years of the study, 12 sites that supported them during two of the study years, and 19 sites that supported birds for a single year (Map 2).

The occupancy rates of surveyed sites in 2020 (during operation) were between the values observed during the pre-construction surveys in 2017 and 2019 (Map 2). The occupancy rates observed in 2020 were not significantly different from those during the pre-construction surveys in 2017 ($P = 0.66$) or 2019 ($P = 1.00$). This suggests that ROW clearing did not impact golden-winged warbler numbers and no unanticipated local population effects were present.

As prescribed in the Golden-winged Warbler Vegetation Management Plan, a feathered edge containing a mixture of shrubs and perch trees was to remain to the extent possible in the ROW and mitigate for changes in habitat availability (WRCS 2017a). Although many sites retained perch trees along the periphery of the ROW edge, few locations had perch trees distributed in the middle of ROW. In addition, shrub growth did not appear to be retained as expected and typically remained only around small wetlands (Szwaluk 2020; Photo 5-Photo 5). Based on subjective evaluation of shrub and forb density on the ROW, the vegetation often appeared to be too sparse to be used as nesting habitat by golden-winged warblers in June 2020. The detection of most birds in the vegetation at the edge of the ROW corroborated where most of the suitable habitat remained. As a result, although habitat mitigation did not appear to meet all the objectives of immediately enhancing or maintaining golden-winged warbler habitat throughout the ROW, it did not affect population abundance. It is expected that by next growing season (2021), tall shrub cover (>4 m) will be increase in numerous areas along the ROW (Szwaluk 2020), increasing habitat suitability over the entire ROW for breeding golden-winged warblers.

**Table 2: Percent occupancy of surveyed sites during pre-construction (2017 and 2019) and operation (2020)**

| Year | Site Type | No. Sites Surveyed | No. Birds Detected | No. Sites w. Detections | Site Occupancy (%) |
|---|---|---|---|---|---|
| **2017** | ROW | 44 | 11 | 8 | 18 |
| | Reference | 20 | 5 | 5 | 25 |
| **2019** | ROW | 44 | 19 | 15 | 34 |
| | Reference | 14 | 8 | 5 | 36 |
| **2020** | ROW | 53 | 11 | 10 | 19 |
| | Reference | 15 | 3 | 3 | 20 |

No incidental observations of other rare bird species (*e.g.,* least bittern, short-eared owl) occurred during the surveys in 2017, 2019, or 2020.

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**Map 2: Number of years golden-winged warbler were detected at each site from the 2017, 2019, and 2020 surveys**

**Photo 3: Feathered edge and perch trees left along the right-of-way, May 2020**

**Photo 4: Shrubs remaining along the right-of-way, June 2020**

**Photo 5: Example of limited shrub and perch tree retention on the Manitoba-Minnesota Transmission Project ROW, June 2020**

# RECOMMENDATIONS

No additional mitigation actions appear to be required at this time. It is anticipated that as vegetation regrows on the ROW it will become more suitable for golden-winged warblers and should attract more individuals. If unanticipated effects are evident that would reduce the quality of golden-winged warbler habitat (e.g., substantially limited shrub and forb growth on the ROW), additional mitigation measures such as shrub planting would be prescribed at that time. As recommended in the Manitoba-Minnesota Transmission Project Environmental Monitoring Plan, further monitoring will occur in 2021 to examine for this possible outcome. Further analyses will also be required to assess the magnitude of predicted effects on golden-winged warbler habitat in the ROW, in particular the hypothesis that:

- $H_0$ (null): The construction and installation of the transmission line does not affect the habitat quality or density of golden-winged warbler.
- $H_1$ (alternate): The construction and installation of the transmission line does affect the habitat quality or density of golden-winged warbler.

This may include development of golden-winged warbler habitat models from remotely-sensed imagery and ground-based vegetation surveys.

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# APPENDIX A

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**Map 1: Golden-winged warbler observations, June 2017**

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**Map 2: Golden-winged warbler observations, June 2019**

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**Map 3: Golden-winged warbler observations, June 2020**

# APPENDIX G

# MANITOBA-MINNESOTA TRANSMISSION PROJECT:

# MAMMAL MONITORING PROGRAM TECHNICAL REPORT (2019/20)

DECEMBER 20, 2021

**Prepared for:**

Manitoba Hydro

**Prepared by:**

Joro Consultants

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|---|---|
| AC | Alternating Current |
| BACI | Before-After-Control-Impact |
| EIS | Environmental Impact Statement |
| FPR | Final Preferred Route |
| GHA | Game Hunting Area |
| GPS | Global Positioning Service |
| IR | Infrared |
| LAA | Local Assessment Area |
| MMTP | Manitoba-Minnesota Transmission Project |
| MSD | Manitoba Sustainable Development |
| RAA | Regional Assessment Area |
| RAI | Relative Abundance Index |
| RM | Rural Municipality |
| ROW | Right-of-way |
| SD | Secure Digital |
| VC | Valued Component |
| WMA | Wildlife Management Area |

# EXECUTIVE SUMMARY

Aerial surveys for ungulates and predators were replicated in 2020 as part of the wildlife monitoring requirements outlined in the Manitoba-Minnesota Transmission Line Project (MMTP) Environmental Monitoring Plan (2019). Surveys were conducted in previously identified survey units including two affected units and five control units. The 2020 survey represents data for the construction period. In total, 584 individual white-tailed deer tracks, or animals, were observed in the potentially affected and control survey units with a density of 1.3 deer/km$^2$. The distribution and relative abundance of deer densities in the 2020 construction phase matched patterns during pre-construction (2017-2018) and support hypotheses that null effects have been observed during the construction period relative to ungulate density, distribution, and mortality. The gradient in deer abundance observed is consistent across years, with fewer deer in the southwest, and greater densities to the north and east, corresponding to habitat cover and land-use. Although absolute densities in 2020 during construction were lower than pre-construction (2017-2018), these differences were not statistically significant, except for one control unit (E), which is a non-affected survey unit. Potentially affected survey units had no significant differences. Additionally, no moose or elk were observed in any of the survey units. Predator species observed included three bear and six wolves all observed in control units. Coyotes were not observed, and no predator tracks were found within affected areas and the null hypothesis of no predation effects has been accepted.

Camera trap monitoring was also replicated in 2019 and 2020, with a total of 16 camera trap arrays used in the study including 10 cameras positioned in potentially affected areas along the FPR and 6 cameras in reference or control areas. A combined total of 10,758 camera-days in the 2019 and 2020 seasons observed 1,505 white-tailed deer events (2,112 individuals), 284 black bear events (333 individuals), 44 gray wolf events (56 individuals) and 39 coyote events (42 individuals). Statistical analysis of control and affected site observations revealed no significant variation between treatments for white-tailed deer and black bear; observations of gray wolf and coyote were also similar between affected and control treatments, though total observations were too low for statistical analysis.

Both survey methods continue to support the predictions as outlined in the MMTP Environmental Impact Statement (EIS). Recommendations for further monitoring include ongoing replication of aerial surveys and trail camera studies and analysis to augment ungulate and predator distribution, abundance, and potential mortality risks to ungulates during the operation phase.

# 1.0 INTRODUCTION

Manitoba Hydro (MH) constructed the Manitoba Minnesota Transmission Project (MMTP), which consists of a 500 kilovolt AC transmission line in southeastern Manitoba. Construction of the MMTP began during the summer of 2019 and was completed in June of 2020. The Project originates at the Dorsey Converter Station northwest of Winnipeg and continues south around Winnipeg, within the Existing Transmission Corridor, the Southern Loop Transmission Corridor, and the Riel-Vivian Transmission Corridor, to just east of Provincial Trunk Highway 12. The route continues southward across the rural municipalities (RM) of Springfield, Tache, Ste. Anne, La Broquerie, Stuartburn, and exits at the Canada-United States border near the community of Piney.

This report provides the results of mammal monitoring including white-tailed deer and predators from aerial surveys conducted during winter in 2016, 2017, 2018 (pre-construction), and 2020 (during construction). Surveys were conducted to evaluate null and alternate hypotheses for ungulates (elk, moose, and white-tailed deer) relative to mortality, distribution, and abundance. Surveys also provided data on the distribution and abundance of predators (coyote and grey wolf) to test null and alternative hypotheses on their observed impact on ungulates as outlined in the MMTP Environmental Monitoring Plan (2019). Existing camera traps installed for pre-construction monitoring were also carried over into post-construction monitoring, with a total of 16 camera trap arrays used in the study with 10 cameras positioned in potentially affected areas along the FPR and 6 cameras in reference or control areas.

The purpose of this report is to summarize the results of the pre-construction aerial survey and trail camera data and to compare/contrast results from construction data and assess/accept null or alternate hypotheses related to Project effects. Narratives of results relative to the potential effects described in the EIS and Environmental Monitoring Plan are provided.

# 2.0 MAMMALS OVERVIEW AND PROJECT RELATED POTENTIAL EFFECTS

White-tailed deer are the predominant ungulate in the Project area, a Valued Component (VC) species, and an important species to the Project. Within Game Hunting Area (GHA) 35, white-tailed deer are a highly valued species for hunting and outfitting use. Previous monitoring reports have provided thorough species overviews as shared below (Stantec 2018).

> *Transmission line corridors create habitat edges for white-tailed deer that provide an ecotone with high quality forage resources and accessible hiding cover in adjacent forest (Reimers et al. 2000). Disturbed vegetation is favoured by white-tailed deer because of the high diversity of plants in those areas (Stewart et al. 2011). Riparian areas, edge habitats, and linear features function as important habitats for travel and forage. Therefore, white-tailed deer are not particularly susceptible to the effects of habitat fragmentation but may be susceptible to increased mortality associated with moving through higher risk areas created by habitat loss and degradation of matrix quality (Stewart et al. 2011).*
>
> *The EIS identified a potential Project effect of increased mortality risk from hunters and predators by enhanced access to white-tailed deer habitat in eastern portions of the Project, however the effect is expected to be minimal with no measurable effect on abundance anticipated. In that portion of the Project, white-tailed deer concentrations were noted in areas near Ste. Genevieve, Richer, Sundown, Piney, and in the Watson P. Davidson and Spurwoods WMAs. The deer population in the area is considered to be stable. Habitat loss and sensory disturbance effects from ROW clearing are considered minimal and short-term, ultimately resulting in a positive effect of enhanced deciduous browse forage and increased edge habitat during the operation phase.*

*Elk*

Studies regarding elk have been initiated by Manitoba Conservation and Climate. In addition, a Memorial University Master's program is reviewing components of elk populations with the same range as studied for the right-of-way (ROW). Both initiatives may provide future data and perspectives to supplement this monitoring effort.

Previous monitoring reports have provided thorough species overviews as shared below (Stantec 2018).

> *As described in the EIS, the Vita elk population in Manitoba (fall/winter range) is shared with Minnesota (summer range) and is the only elk population with potential to interact with the Project. Long-term census data in Manitoba for this elk population are limited, with a stable population estimate of 100-150. Annual surveys (2004-2008) conducted in Minnesota estimated the population at 112-215 elk (MDNR 2009). The Vita elk range in Manitoba may overlap an eastern portion of the Project Regional Assessment Area (RAA; a 15 km buffer around the Project footprint) in areas near Vita and Caliento, however, EIS field studies did not detect elk occurrence within the ROW or Local Assessment Area (LAA; a 1 km buffer around the Project footprint), or RAA. The closest observations during baseline surveys were 20 km from the final preferred route. The ROW avoids the core areas known to support elk near Vita and Arbakka, with no anticipated significant adverse Project effects on the population. Since the filing of the EIS, MH has joined with the RM of Stuartburn, MSD, and the Nature Conservancy Canada to form the Vita Cross-Border Elk Monitoring Partnership. This new partnership is aimed to understand movements and home range size of elk by utilizing GPS collar technology in southeast Manitoba but is not part of this monitoring report.*

*Moose*

As described in the MMTP EIS, moose populations in southern Manitoba have experienced significant declines over the years. Previous monitoring reports have provided thorough species overviews as shared below (Stantec 2018).

> *Moose were a common ungulate species in southeastern Manitoba prior to the 1990s but populations in the region have since collapsed (Leavesley 2015, pers. comm., Rebizant 2015, pers. comm.). Despite the presence of suitable moose habitat (e.g., shrubby wetlands, alder swamps, sub-climax deciduous forest; Banfield 1974), moose are rare in southeastern Manitoba due to a combination of factors such as habitat fragmentation, predation by wolves, parasites, fire suppression, and unregulated harvest (Leavesley 2015, pers. comm., Rebizant 2015, pers. comm). The areas south of the Watson P. Davidson Wildlife Management Area heading southeast to the Spur Woods WMA and south of Piney, in the RAA was identified as containing moose habitat, especially near Piney (Black River First Nation, Long Plain First Nation and Swan Lake First Nation 2015).*

*Black Bear*

Previous monitoring reports have provided thorough species overviews as shared below (Stantec 2018).

*Black bears favor high landscape connectivity and are sensitive to significant habitat changes and disturbances that affect access to, and availability of, food resources (Rogers and Allen 1987, Gunson 1993, Kindell and Van Manen 2007). They are widely distributed as a consequence of food resource availability both spatially and seasonally (Gunson 1993, Costello and Sage 1994, Pelton et al. 1999, Pelton 2000), but local abundance may be variable depending on annual severity of weather and food availability. Bears may avoid linear development with active human activity, particularly during denning (Forman et al. 1997, Linnell et al. 2000).*

*The EIS indicates the black bear population within the RAA is stable (possibly increasing), with common occurrence and widespread distribution throughout areas supporting forest habitat; particularly at the forest-agricultural habitat interface, primarily east and south of the Watson P. Davidson WMA. Field studies identified bear activity within the vicinity of the proposed D604I ROW, along existing transmission line M602F, and other forested parts of the RAA, occupying forested areas near the communities of Richer, Marchand, Sundown, and Piney.*

*Black bears are an important species to subsistence users (First Nations and Metis) and to the livelihood of local commercial outfitters. The Project footprint will contribute to habitat fragmentation of natural habitat patches that may affect bear habitat availability, occurrence, and distribution. Measurable changes in abundance are not anticipated because of Project activities or disturbance because of routing and scheduling of construction activities.*

*Predators*

*The ROW and Project access development may enhance predator mobility into areas that were previously secure habitat for prey species, decrease predator search times for prey, and/or make prey escape more difficult. Predators such as wolves and coyotes may benefit from enhanced access, leading to increased predation of ungulates.*

# 3.0 MAMMAL MONITORING PLAN OVERVIEW

The MMTP Environmental Monitoring Plan (2019) identifies specific monitoring activities to evaluate several null and alternate hypotheses related to Project effects. To test these hypotheses, a Before-After-Control-Impact (BACI) has been implemented using data gathered during the mammal baseline (pre-construction), during construction and operation monitoring surveys described in this report and the Environmental Monitoring Plan (2019). Distribution of white-tailed deer, elk, wolves and coyotes through aerial surveys and camera trap studies have been conducted relative to the Project ROW to assess distribution and population trends as a factor of density in Project effected and control blocks to assess any potential of increased mortality. The monitoring program has been designed to test these hypotheses and are summarized as follows (MMTP Environmental Monitoring Plan, 2019).

- *Hypothesis 1:*
- $H_0$ (null): The construction of the transmission line does not affect the distribution of white-tailed deer.
- $H_1$ (alternate): The construction of the transmission line does affect the distribution of white-tailed deer.
- *Hypothesis 2:*
- $H_0$ (null): The operation of the transmission line does not affect the distribution of white-tailed deer.
- $H_1$ (alternate): The operation of the transmission line does affect the distribution of white-tailed deer.
- *Hypothesis 3:*
- $H_0$ (null): The operation of the transmission line does not change the mortality risk for white-tailed deer.
- $H_1$ (alternate): The operation of the transmission line does affect the mortality risk for white-tailed deer.

Initial monitoring focused on pre-construction baseline data collection to facilitate the validation of EIS predictions and verification of mitigation measures to determine if the Project has altered distribution and occurrence of ungulates and predators. Monitoring during construction and operation is to assess whether distribution and occurrence has changed relative to the baseline conditions. Monitoring is focused on white-tailed deer as this is the dominant ungulate in the Project area, as well as predators, which include wolves, coyotes, and black bears. Moose densities are known to be very low. Therefore, specific monitoring of moose populations was not conducted. However, all moose observations have been documented from both pre-construction and construction monitoring activities, including aerial transect and camera trap surveys.

Pre-construction baseline data provided information on the distribution and abundance of white-tailed deer, allowing for comparison with data collected during construction in January 2020 and

operation (anticipated for 2021) and beyond. These data were used to determine changes resulting from the development, to validate and accept the hypotheses and predictions in the EIS, and apply adaptive management if necessary, during the operational phase.

# 4.0 METHODS

## 4.1 Aerial Mammal Survey

Aerial transect surveys have been consistent and applied across the study areas across 7 survey blocks (A-G) and are illustrated on Map 1. These consist of potentially affected and control blocks to allow for comparison of densities throughout the Project area. Previous surveys were conducted March 7-9, 2016, February 8-9, 2017, and February 8-10, 2018 (pre-construction and on March 4-6, 2020 (during construction). Methods for all surveys followed those described in Stantec (2018) and include:

- Aerial survey of 400-m-wide, east-west transects spaced 1 km apart that comprise 40% (421 $km^2$) of the 1055 $km^2$ overall survey area (Map 2).
- Surveys were conducted using a Bell 206 Jet Ranger helicopter and four observers: the front-left and rear-right observers acted as primary observers on their respective sides while the data recorder in the rear-left and pilot in the front-right acted as secondary observers.
- Surveys were flown at approximately 120 m above ground level at speeds between 90-110 km/h during good environmental conditions:
    - temperature -20 to -30°C;
    - wind 10-20 km/h;
    - cloud ceiling >150 m;
    - no precipitation;
    - no fog or hoar frost;
    - adequate daylight (from one half hour after sunrise to one half hour before sunset);
    - with a snow base of ≥25 cm (MCWS 2015, unpublished).
- Using a handheld GPS (Garmin® GPSMAP® 62SC) the surveys focused on counting individuals as opposed to counting both tracks and individuals, as was done in 2014-2015, as counting tracks has the potential to decrease detection rates of observers. Track observations were collected for species such as gray wolf and coyote where possible.

### 4.1.1 Analytical Methods

To accommodate a future Before-After-Control-Impact (BACI) analysis, density statistics were generated for all survey units illustrated in Map 1. These units included the Final Preferred Route (FPR) with a 1 km buffer to represent potentially affected post-construction units (survey units A and B), following Linnell *et al.* (2000) and Benitez-Lopez *et al.* (2010). Five units are considered control units (survey units C-G). All survey units were georeferenced and survey data were summarized and mapped using ArcGIS® ArcMap 10.8. During-construction data (2020) were compared to pre-construction baseline data and summarized by survey unit and

year. White-tailed deer density is calculated as the number of individuals observed per unit area surveyed.

Summary statistics were calculated in CRAN R (R Core Team 2020). Statistics include means for 2017-2018 (excluding 2016 as in previous reports), and pooled means for 2017-2020. To test pre-construction densities compared to construction densities collected in 2020, a Crawford-Howell (1998) t-test for case-control comparisons was performed and significance was assessed using p-values. This test calculates a t-test (and associated t-value) for comparing single observations (i.e., the single year construction densities in each survey unit) to a set of several observations (i.e., pre-construction densities in the survey units), and is suitable for small sample sizes. Observed densities during the 2020 construction phase are only considered significantly different from the pre-construction baseline, when the p-value calculated on a t-value is less than 0.05. P-value is the probability that the observed density differences are random, so the lower the P-value, the more likely it is not random.

## 4.2 Camera Trap Survey

Large mammals, particularly white-tailed deer, elk, and black bear are the primary targets of the camera trap study, but incidental observations of other species (i.e., moose) and human activity were also recorded. In this study, infrared (IR) camera trap arrays are used to monitor mammal activity along the FPR (i.e., potentially affected sites) and adjacent control areas (>500 m from the FPR).

Survey efforts focused on large, contiguous patches of intact forested habitats between Provincial Highway 12 and the Canada-U.S. border that are most likely to be affected by habitat fragmentation. The LAA in this extent includes softwood forest (36% total area), hardwood forest (18%), and mixedwood forest (4%). Site selection aimed to sample each forested habitat equally in both potentially affected sites and control sites; however, the lack of mixedwood forest within the LAA limited its inclusion.

Existing camera traps installed for pre-construction monitoring were carried over into post-construction monitoring, with a total of 16 camera trap arrays used in the study with 10 cameras positioned in potentially affected areas along the FPR and 6 cameras in reference or control areas (Map 3). These include one long term monitoring camera site (MMTP_LTM_012) originally installed in 2015, and 15 monitoring camera sites originally installed in May 2017. No new camera trap sites were established for post construction monitoring.

Camera traps were checked and redeployed/reset in June 2018 and again in April 2019, with the final data retrieval to date occurring in October/November 2020 or January 2021. For post-construction monitoring assessment in this report, data between November 2018 and October 2020 were analyzed and reported on, divided into winter (November – April) and summer (May – October) cohorts.

IR cameras were attached to trees at approximately 1 m from ground level and all vegetation that might falsely trigger or obscure the camera view was removed within at least 5 m, where possible. Reconyx™ cameras were used in continuous photo capture mode (i.e., a 2-photo burst with no time delay) and using compact flash type I/II or SD (Secure Digital) memory cards.

### 4.2.1 Analytical Methods

Results of camera trap surveys were provided by MH, generated following established photo analysis. All photographs were classified using MH's Camera Trap Data Classification Guide (Manitoba Hydro 2014) to identify the number, age, sex, and species involved in each camera event. A camera event is considered to be any number of individuals of a particular species captured on camera within a one-hour period. An annual relative abundance index (RAI; number of photo events / camera-days) is calculated for key species (i.e., white-tailed deer, black bear, gray wolf, and coyote), year, and season (summer [May-October] and winter [November-April]) at each of the 23 IR camera trap sites (10 affected sites, and 6 control sites). Analyses were not constrained to a minimum number of operational days per site/season combination. Box plots of annual RAIs are be used to visualize differences between IR camera trap treatments (i.e., potentially affected sites vs. control sites). A two-sample T-test was used to test for differences between RAI treatment means of each species (after a F-test was used to determine equality of sample variances).

# 5.0 RESULTS

The following sections describe the results of pre-construction aerial mammal and camera trap surveys conducted between 2016 and 2020. Figure 1 shows an example of a black bear den observed during aerial survey. In some instances, pre-construction data have been grouped into treatment categories (e.g., potentially affected) to facilitate comparisons with data gathered during the construction and operation phases. All null and alternate hypotheses were evaluated and tested resulting in the current acceptance of the null hypotheses of no detectible Project effects on the distribution of ungulates and predators and no indication of decreased ungulate densities as a result of increased mortality. The following sections provide the results of the analyses conducted during the pre- and during construction period.

**Figure 1: Example of black bear den observation during aerial survey**

## 5.1 Aerial Mammal Survey

*Ungulates*

The density trends are considered to be representative of white-tailed deer populations in the survey area during the years surveyed and there are no detectible or significant changes in densities which support the null hypotheses relating to changes in distribution, abundance or mortality.

As a result of poor snow conditions, data from 2016 are not considered robust, and subsequently not used in the calculation of any statistics in this report, including mean density comparisons. Overall, the total density of deer observed in the reporting area in 2020 (Table 1) were lower (1.3 deer/km$^2$), compared with 2017 (2.3 deer/km$^2$) and 2018 (2.0 deer/km$^2$). Deer

densities observed in 2020 were highest in north-eastern and eastern control survey units (survey units C, D, and E) with densities ranging from 1.46-2.55 deer/km$^2$, while western survey units ranged from 0.26-0.91 deer/km$^2$ (Table 2). Density of deer in the survey units along the Final Preferred Route (FPR) were lower than the control blocks to the north-east, with unit B having a higher deer density than unit A, but these densities were higher than the south-west control survey units F and G. The pattern in deer densities observed in 2020 for both the control and potentially affected survey units matches the pre-construction surveys in terms of relative abundance, but in general, there were consistently higher deer densities in all survey units in 2017 and 2018 compared with 2020 (Figure 2; Table 1 and Table 2). That said, the lower densities of deer observed in 2020 (during construction) are not statistically significant from the 2017-2018 (pre-construction) survey units, except for one control survey unit (E). This unit is not affected by the construction, and the variation is likely a result of annual variation in natural deer populations and their distribution.

There were no elk observations in 2016-2018 and moose observations have been limited to three tracks in 2018, in the southeast corner of the survey area (Map 4). These results support the assumption of the null hypothesis that the Project has had no effect on elk or moose distribution or abundance.

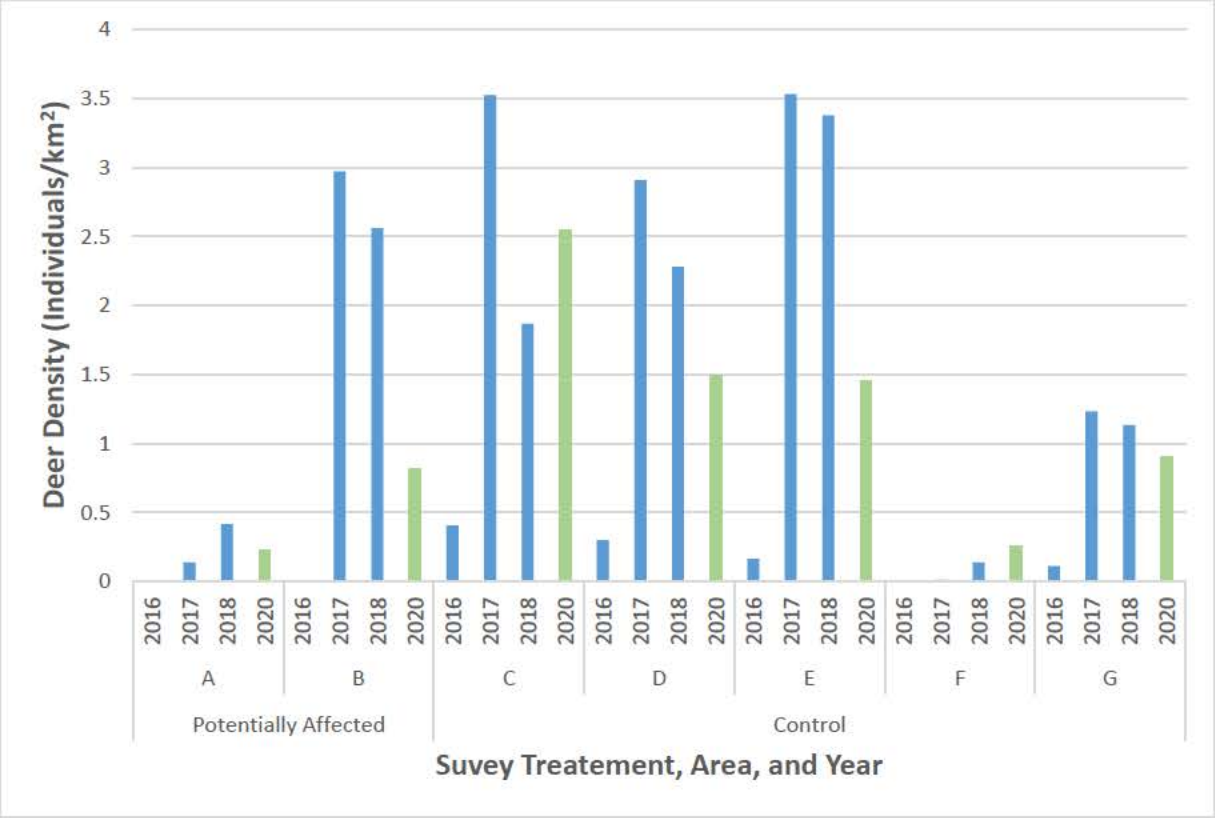


**Figure 2: Summary of white-tailed deer densities by survey treatment, survey unit, & year, pre-construction (blue) and during construction (green)**

**Table 1: Summary statistics of white-tailed deer individuals observed in 2016-2020**

| Year | No. of Observations | No. of Individuals | Min. Group Size | Max. Group Size | Density (deer/km²) |
|---|---|---|---|---|---|
| 2016 | 45 | 83 | 1 | 5 | 0.2 |
| 2017 | 311 | 978 | 1 | 16 | 2.3 |
| 2018 | 299 | 840 | 1 | 12 | 2.0 |
| 2020 | 216 | 548 | 1 | 18 | 1.3 |

**Table 2: Summary of white-tailed deer densities by survey treatment, unit, and year. Statistics include means for 2017-2018 (excluding 2016 as in previous reports) and pooled means for 2017-2020, also provided are t-values from the Crawford-Howell (1998)**

| Survey Treatment | Survey Unit | Year | Survey Unity Density (deer/km²) | Mean Survey Unit Density (deer/km²) 2017-2018 Pooled (2017-2020) | t-value | p-value |
|---|---|---|---|---|---|---|
| | A | 2016 | 0.00 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Potentially Affected | | 2017 | 0.14 | 0.28 | -0.195 | 0.877 |
| | | 2018 | 0.42 | | | |
| | | 2020 | 0.23 | (0.26) | | |
| | B | 2016 | 0.00 | 2.77 | -5.48 | 0.115 |
| | | 2017 | 2.97 | | | |
| | | 2018 | 2.56 | | | |
| | | 2020 | 0.82 | (2.12) | | |
| Control | C | 2016 | 0.41 | 2.70 | -0.10 | 0.935 |
| | | 2017 | 3.52 | | | |
| | | 2018 | 1.88 | | | |
| | | 2020 | 2.55 | (2.65) | | |
| | D | 2016 | 0.30 | 2.59 | -2.03 | 0.291 |
| | | 2017 | 2.91 | | | |
| | | 2018 | 2.28 | | | |
| | | 2020 | 1.49 | (2.23) | | |
| | E | 2016 | 0.17 | 3.45 | -14.83 | 0.043 |
| | | 2017 | 3.53 | | | |
| | | 2018 | 3.38 | | | |
| | | 2020 | 1.46 | (2.79) | | |
| | F | 2016 | 0.00 | 0.08 | 1.74 | 0.332 |
| | | 2017 | 0.02 | | | |
| | | 2018 | 0.14 | | | |
| | | 2020 | 0.26 | (0.14) | | |
| | G | 2016 | 0.11 | 1.18 | -3.23 | 0.191 |
| | | 2017 | 1.23 | | | |
| | | 2018 | 1.13 | | | |
| | | 2020 | 0.91 | (1.09) | | |

*Predators*

Observations of wolf and coyote have not illustrated any detectable changes in densities or occurrence from the pre- and during-construction period (Table 3).

**Table 3: Summary statistics of gray wolf and coyote observations in 2016-2020**

| Species | Year | Observation Type | No. of Observations | No. of Individuals | Min. Group Size | Max. Group Size |
|---|---|---|---|---|---|---|
| Gray Wolf | 2016 | Individual | 0 | 0 | 0 | 0 |
| | | Track | 10 | 12 | 1 | 3 |
| | 2017 | Individual | 4 | 13 | 1 | 8 |
| | | Track | 8 | 31 | 1 | 8 |
| | 2018 | Individual | 2 | 2 | 1 | 1 |
| | | Track | 4 | 6 | 1 | 3 |
| | 2020 | Individual | 0 | 0 | 0 | 0 |
| | | Track | 6 | 6 | 1 | 1 |
| Coyote | 2016 | Individual | 1 | 2 | 2 | 2 |
| | | Track | 18 | 19 | 1 | 2 |
| | 2017 | Individual | 5 | 6 | 1 | 2 |
| | | Track | 6 | 6 | 1 | 1 |
| | 2018 | Individual | 4 | 4 | 1 | 1 |
| | | Track | 0 | 0 | 0 | 0 |
| | 2020 | Individual | 0 | 0 | 0 | 0 |
| | | Track | 0 | 0 | 0 | 0 |

## 5.2 CAMERA TRAP SURVEY

A total of 10,758 camera-days from 16 cameras were assessed between November 2018 and October 2020 to assess RAI between potentially affected sites and control sites (Appendix 2, Table 1). There were no moose or elk observations, and data discussed hereafter pertain to white-tailed deer, black bear, gray wolf, and coyote. There were a total of 1,872 wildlife events recorded over the 2019 and 2020 study periods (Table 4), including 1,505 white-tailed deer events (2,112 individuals), 284 black bear events (333 individuals), 44 gray wolf events (56 individuals) and 39 coyote events (42 individuals). Statistical analyses and boxplots were conducted on the dataset divided into winter (November – April) and summer (May – October) study periods. Table 4 provides a summary of camera trap survey events and individual species recorded during the post-construction monitoring period. Detailed trail camera data and results of statistical analyses are provided in Appendix 2.

**Table 4: Summary of camera trap survey events and individuals in affected and control areas recorded in 2019-2020 post-construction monitoring.**

| | | White-tailed Deer | | Black Bear | | Gray Wolf | | Coyote | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Affected** | **Control** | **Affected** | **Control** | **Affected** | **Control** | **Affected** | **Control** |
| 2019 | Observation Days | 3534 | 2190 | 3534 | 2190 | 3534 | 2190 | 3534 | 2190 |
| | Events | 323 | 647 | 71 | 49 | 15 | 10 | 13 | 13 |
| | # of Individuals | 448 | 943 | 78 | 57 | 18 | 12 | 14 | 15 |
| 2020 | Observation Days | 2883 | 2151 | 2883 | 2151 | 2883 | 2151 | 2883 | 2151 |
| | Events | 121 | 414 | 9 | 155 | 10 | 9 | 6 | 7 |
| | # of Individuals | 154 | 567 | 13 | 185 | 14 | 12 | 6 | 7 |
| **Total** | **Observation Days** | **6417** | **4341** | **6417** | **4341** | **6417** | **4341** | **6417** | **4341** |
| | **Events** | **444** | **1061** | **80** | **204** | **25** | **19** | **19** | **20** |
| | **# of Individuals** | **602** | **1510** | **91** | **242** | **32** | **24** | **20** | **22** |

*White-tailed Deer*

White-tailed deer was observed at 12 of 16 sites during summer and 13 of 16 sites in winter 2019/2020 (Map 5 and 6, Photo 1). There was no significant difference between RAI means during summer with 0.12 ± 0.11 and 0.31 ± 0.41 for potentially affected and control sites, respectively ($p = 0.37$; Figure 2a). Similarly, there was no significant difference between RAI means during winter with 0.11 ± 0.11 and 0.20 ± 0.19 for potentially affected and control sites, respectively ($p = 0.33$; Figure 2b).


**Figure 3: A white-tailed deer captured on a trail camera**

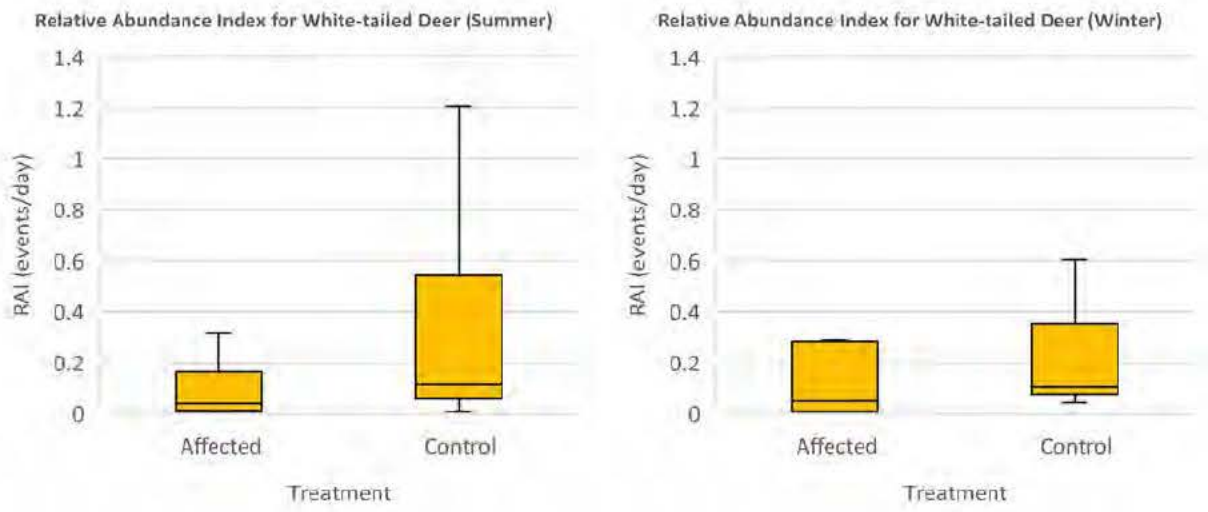


**Figure 4a and 5b: Box plot of white-tailed deer relative abundance index (RAI) for potentially affected and control sites, for summer (Figure 5a on left, May-October 2019 and 2020 combined) and winter (Figured 5b on right, November 2018-April 2019 and November 2019-April 2020 combined).**

*Black Bear*

Black bear was observed at 11 of 16 sites during summer (no data for winter months as black bears typically hibernate during this period; Map 7, Photo 2). There was no significant difference between RAI means with 0.07 ± 0.08 and 0.09 ± 0.15 for potentially affected and control sites, respectively (p = 0.83; Figure 3).

**Figure 5: A black bear captured on a trail camera**

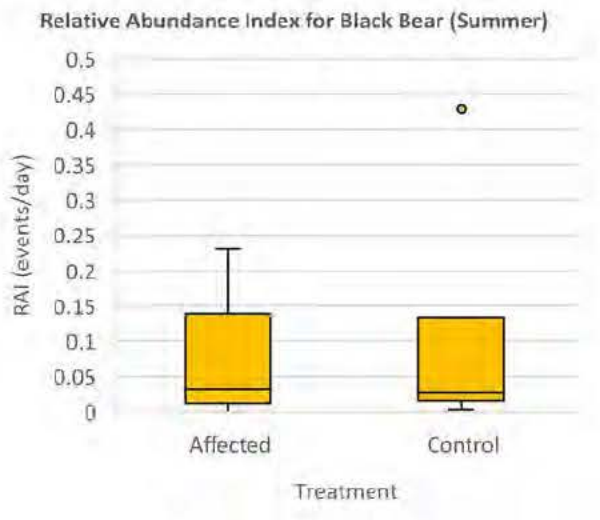


**Figure 6: Box plot of black bear relative abundance index (RAI) for potentially affected and control sites between November 2019 and October 2020, summer and winter combined.**

*Gray Wolf and Coyote*

Gray wolf was observed at 9 of 16 sites during both summer and winter (Map 8, Photo 3) and coyote was observed at 8 sites in each period (Map 9, Photo 4). The limited number of gray wolf and coyote observations precludes formal analyses.


**Figure 7: A gray wolf captured on a trail camera**


**Figure 8: A coyote captured on a trail camera**

# 6.0 DISCUSSION

The densities and distribution of white-tailed deer and predators across all survey blocks during the construction period is consistent with pre-construction data described in the EIS. This confirms Hypothesis 1, that distribution of white-tailed deer has not changed, and density estimates confirm no detectible increase in mortality during the construction phase. White-tailed deer densities remain highest in dense forested areas found in the eastern survey blocks, as observed during pre-construction surveys. During the survey periods (March), deer are expected to utilize dense forest due to lower snow cover compared to more open areas where snow depth can reduce mobility and foraging opportunities (Nelson and Mech 1986). Although not statistically significant, there were slight trends in reduced densities across most survey blocks during the pre-construction phase. There is a pattern in abundance across the survey area, with more deer in the northeast than southwest corresponding to habitat and land-use differences across the study area. This suggests overall, population trends in the region are not related to Project construction during the winter of 2020. One control block (E) showed a slight decline during the 2020 construction period; however, this block is not affected by the Project. Natural annual variability of white-tailed deer populations and their distribution is well known to be influenced by late season snow cover, spring weather (fawn survival), and hunting policy (Fuller 1990). Camera trap surveys similarly identified no significant variation between affected and control treatments during the 2019 and 2020 monitoring seasons. Post-construction aerial surveys were initiated in 2021 but were canceled due to poor weather restrictions. Annual surveys during the operation period are required to confirm and accept Hypothesis 2 and 3 that there will be no effect on deer densities or mortality as a result of operation.

Low numbers of gray wolves and coyotes have been observed during both pre- and during construction (six wolves in 2018 and 2020). Additionally, camera traps identified Gray Wolf events at 9 sites during the 2019 and 2020 seasons combined, with 25 events and 30 observations documented in 2019 and 19 events and 26 observations in 2020, and no notable difference in RAI between control and affected treatments in either year. Similarly, Coyote were identified at 8 sites during the 2019 and 2020 seasons combined, with 26 events and 29 observations documented in 2019 and 13 events and 13 observations documented in 2020, with similar trends between affected and control treatments. As with deer and elk, Hypothesis 2 and 3 supports no detectible effects of the Project operation on increased predators and the associated predation on ungulates. Earlier observations of a wolf pack in 2017 have not been observed during the surveys since. Observations and presence of coyotes should be interpreted with caution, as the survey is a onetime event for that year, and they become more mobile in February and March, which coincides with breeding season (Roy and Dorrance 1985). Coyotes are also generally recognized to be nocturnal, and their habitat selection may be associated with transition forest-agricultural lands, particularly during the breeding season. It is also more

difficult to detect coyotes during winter in dense forest, and their distribution is pack-dependent, rather than individuals being evenly distributed over the landscape, making them difficult to observe.

As discussed, aerial surveys for ungulates and predators are recommended and are anticipated during the winter of 2022 to assess the Null Hypotheses on the distribution of ungulates and associated potential for increased predation.

# 7.0 FUTURE MONITORING

Replication of the aerial surveys during the winter of 2022 is required to further assess operation effects and hypothesis testing as outlined in the MMTP Environmental Monitoring Plan (2019) due to poor survey conditions in 2021. Ongoing monitoring using trail cameras is recommended to augment data to determine distribution and abundance of ungulates and predators during the operation phase of the Project. Further reporting on the results of the 2022 anticipated aerial ungulate and predator survey is required.

# 8.0 REFERENCES

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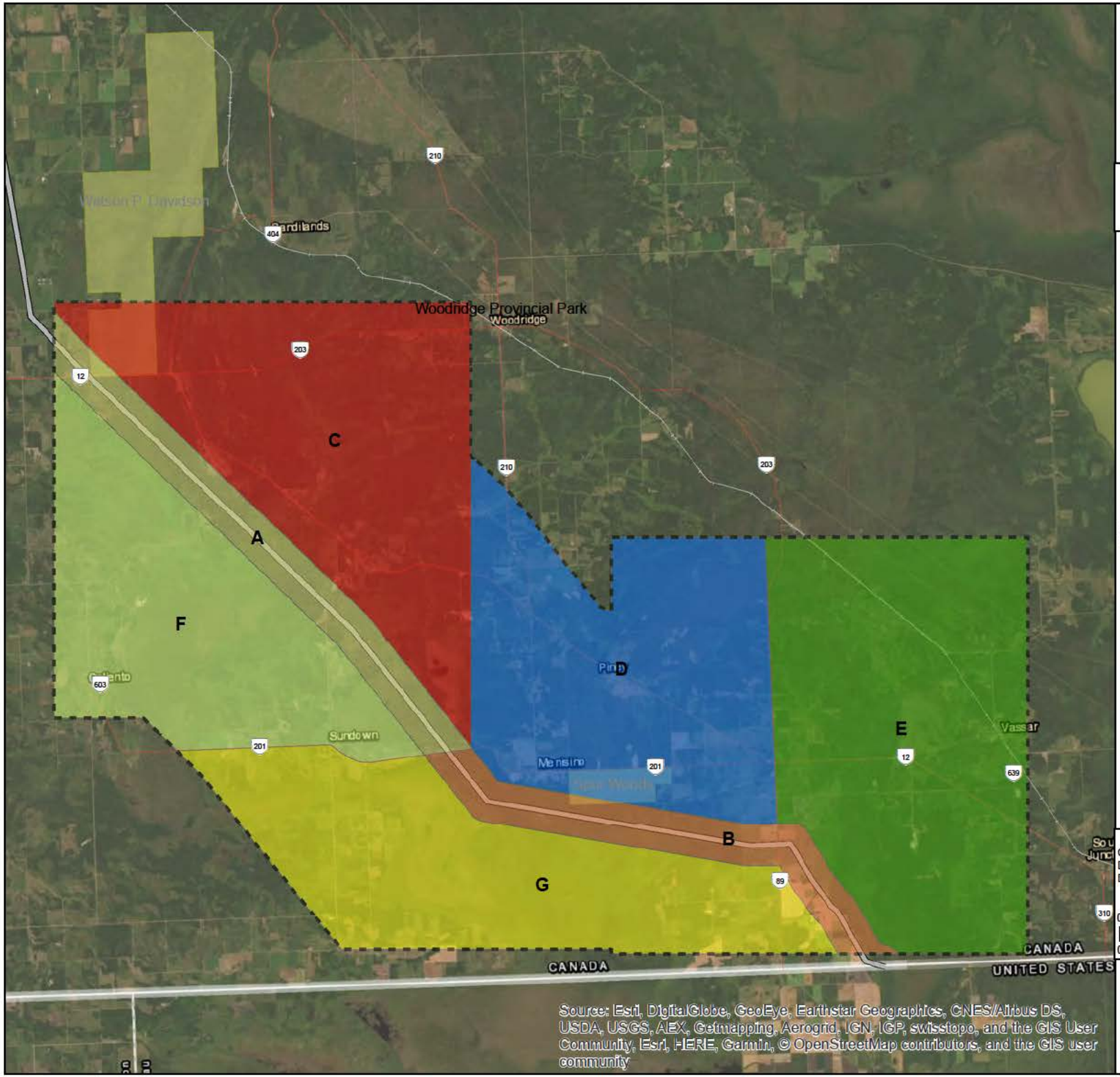
# APPENDIX 1: MAPS

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# Manitoba-Minnesota Transmission Project

## Aerial Mammal Survey Area

- A
- B
- C
- D
- E
- F
- G
- Survey Area (2016-2020)
- MMTP Transmission Line

## Landbase Data

- Community
- Railway
- Provincial Road / Highway
- Wildlife Management Area
- Provincial Park

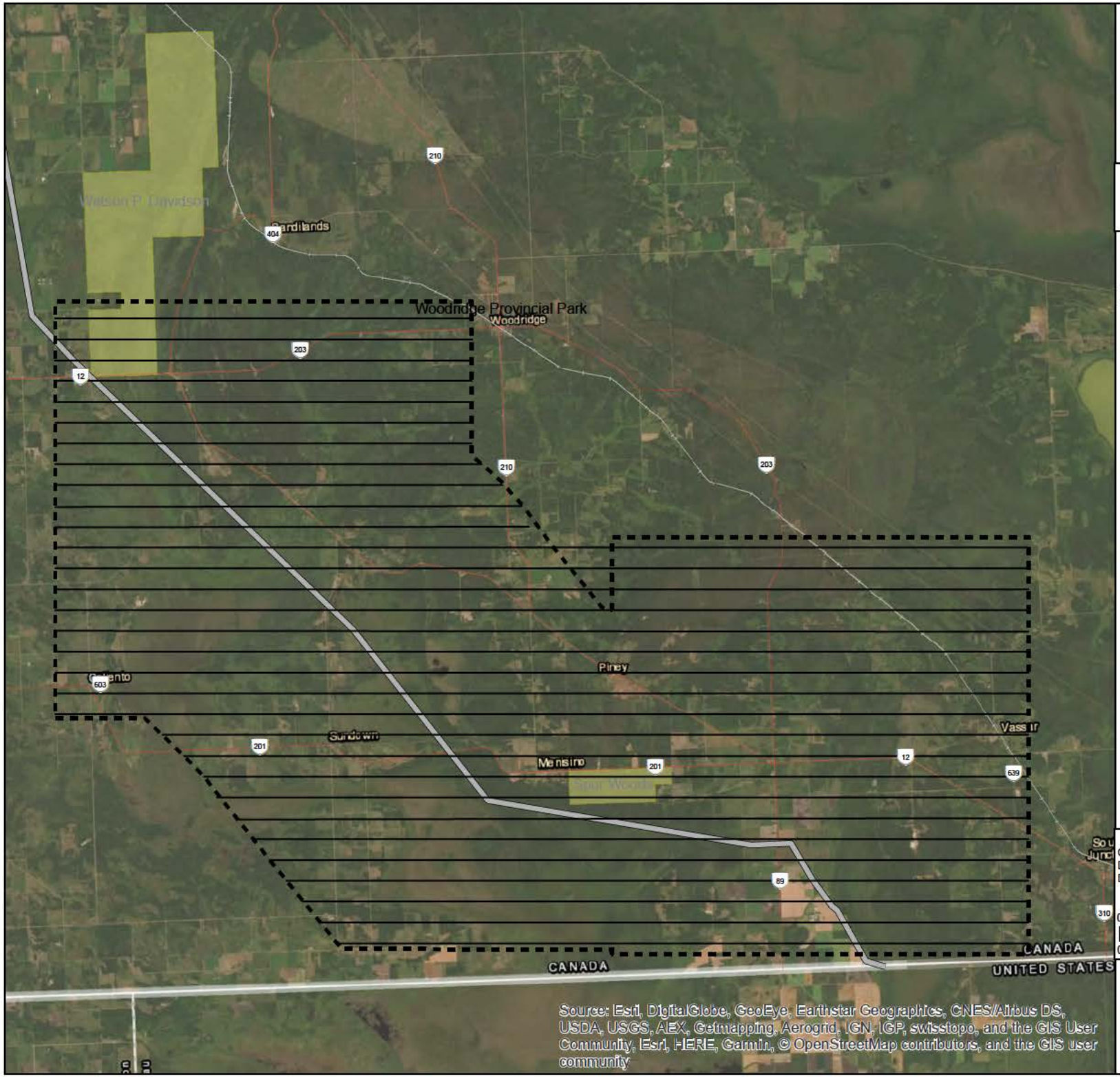
Coordinate System: UTM Zone 14N NAD83
Data Sources: MB Hydro, Joro, ESRI
Date Created: Dec 23, 2020

N

0 3 6 Miles
0 6 Kilometers
1:250,000

## Aerial Mammal Survey Area and Survey Units for Analysis

Map 1




Manitoba Hydro

Joro Consultants

# Manitoba-Minnesota Transmission Project

## Aerial Mammal Survey Area

- Survey Area (2016-2020)
- Multispecies Survey Transects
- MMTP Transmission Line

## Landbase Data

- Community
- Railway
- Provincial Road / Highway
- Wildlife Management Area
- Provincial Park

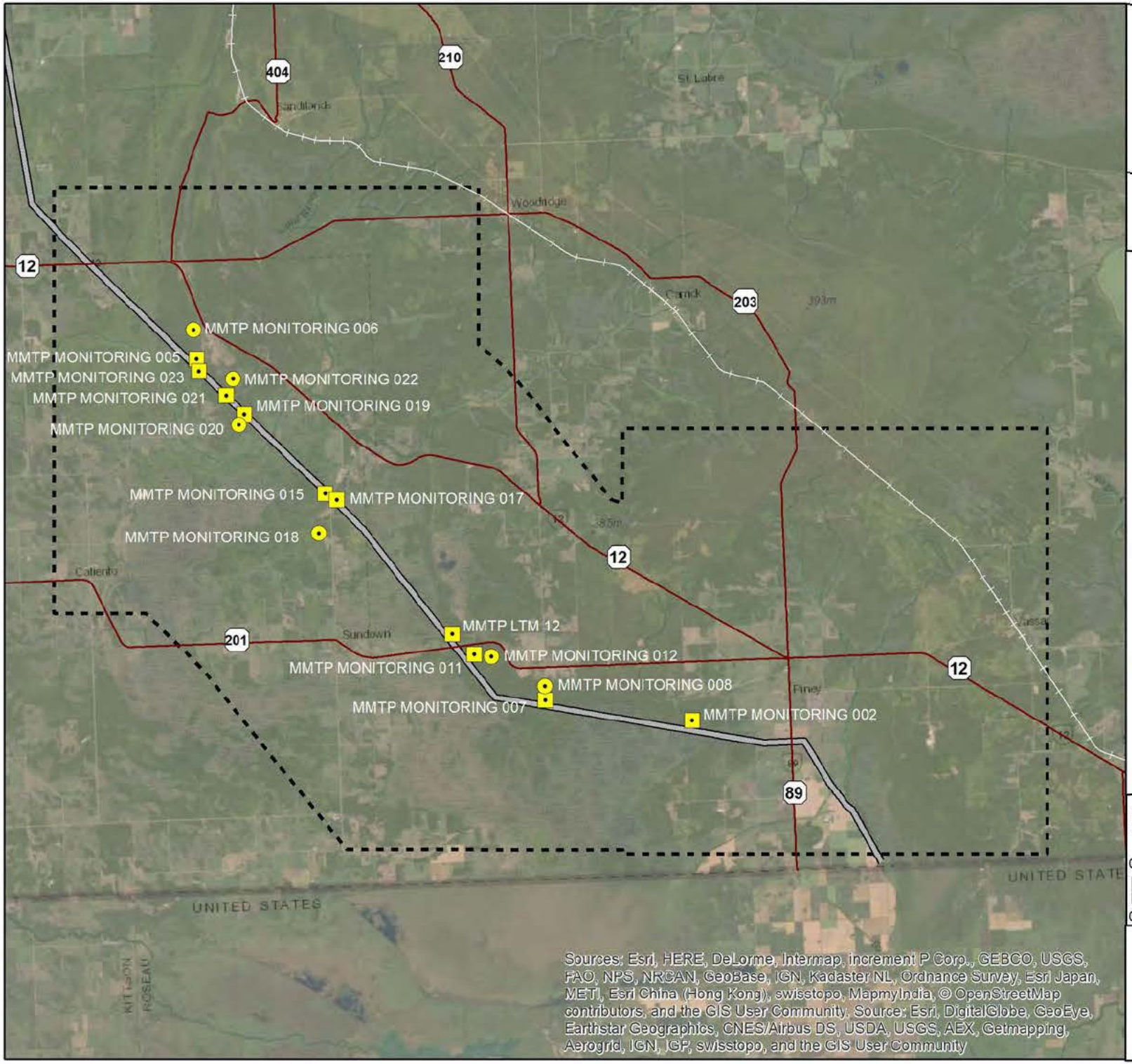
Coordinate System: UTM Zone 14N NAD83
Data Sources: MB Hydro, Joro, ESRI
Date Created: Dec 23, 2020

N

0 6 Kilometers
0 3 6 Miles
1:250,000

## Aerial Mammal Survey Transects

Map 2

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**Manitoba - Minnesota Transmission Project**

Camera Trap Survey Observations 2019-2020

Mammal Camera Trap Locations 2019-2020

- Affected
- Control

Mammal Survey Area

- Survey Area (2016-2020)
- MMTP Final Preferred Route (FPR)

Landbase Data

- Provincial Road / Highway
- Railway

Coordinate System: NAD 1983 UTM Zone 14N
Data Source: MB Hydro, Joro, ESRI, NRCAN
Date Created: Nov 9, 2021

N

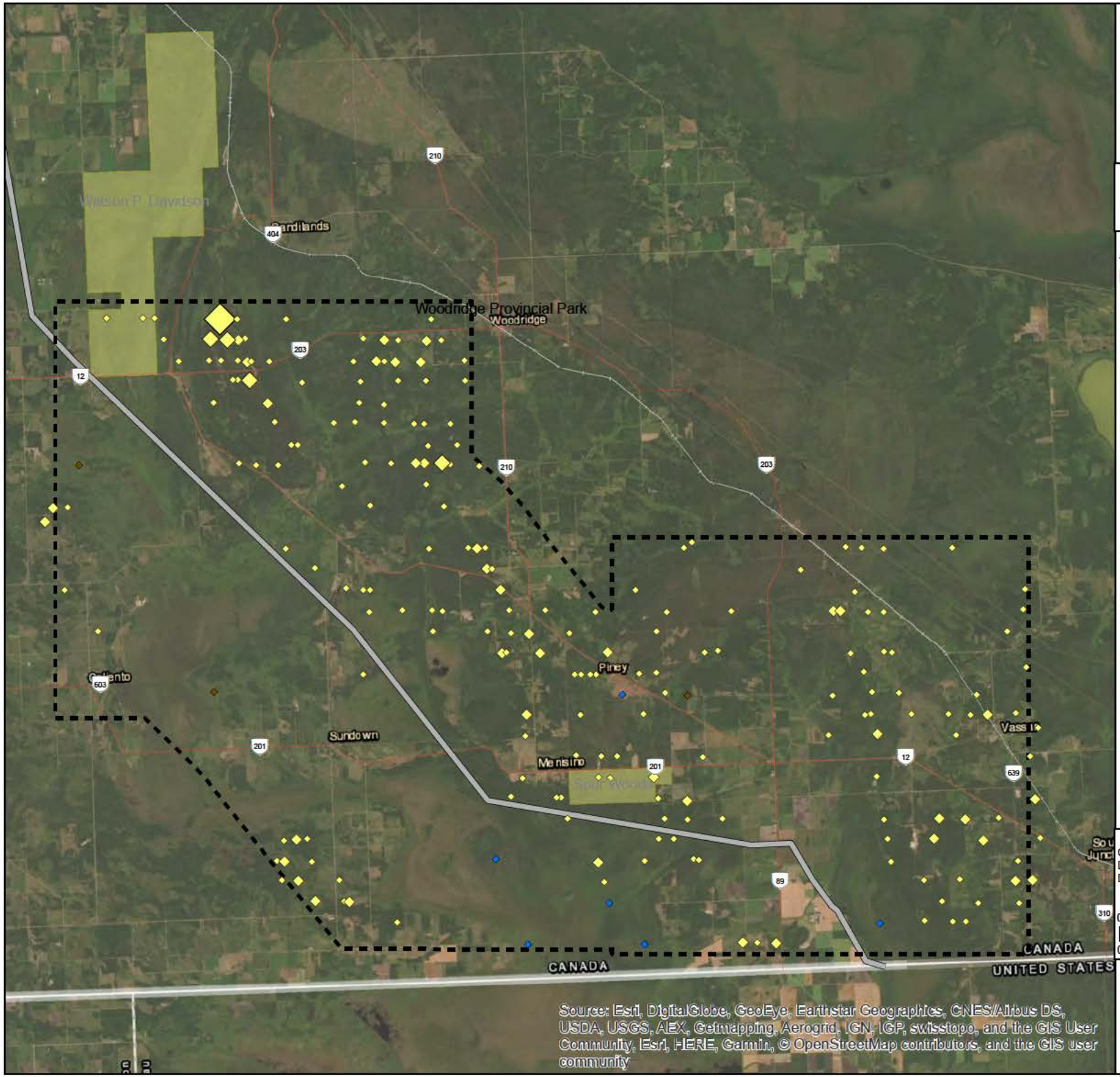
0 6 Kilometers

1:250,000

0 3 6 Miles

**Camera Trap Survey Locations 2019-2020**

Map 3

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# Manitoba-Minnesota Transmission Project

## Aerial Mammal Survey Observations 2020

| Bear | Deer | Wolf |
|---|---|---|
| 1-3 | 1-3 | 1-3 |
| | 4-6 | |
| | 7-9 | |
| | 10-12 | |
| | 12-15 | |
| | 16-18 | |

## Aerial Mammal Survey Area

- Survey Area (2016-2020)
- MMTP Transmission Line

## Landbase Data

- Community
- Railway
- Provincial Road / Highway
- Wildlife Management Area
- Provincial Park

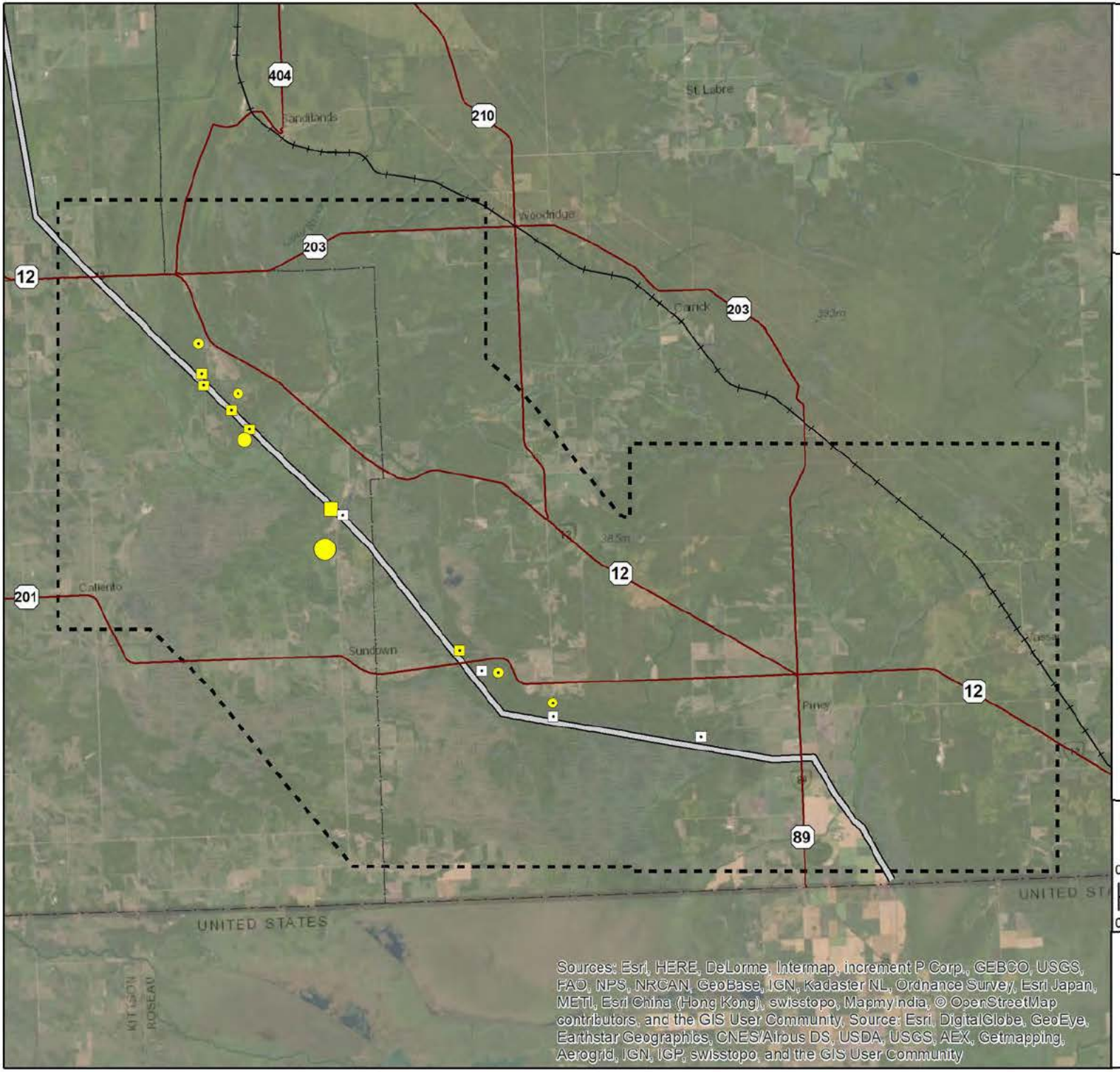
Coordinate System: UTM Zone 14N NAD83
Data Sources: MB Hydro, Joro, ESRI
Date Created: Dec 23, 2020

N

0 6 Kilometers
0 3 6 Miles
1:250,000

## Aerial Mammal Survey Observations 2020

Map 4




Manitoba Hydro

Joro Consultants

# Manitoba - Minnesota Transmission Project

## White-tailed Deer RAI Values (Summer)

| Control | | Affected |
|---|---|---|
| ⊙ | 0.00 | ⊡ |
| ⊙ | >0 - 0.25 | ⊡ |
| ● | 0.26 - 0.50 | ■ |
| ⊗ | 0.51 - 0.75 | ⊠ |
| ● | >0.75 | ■ |

Mammal Survey Area

MMTP Transmission Line

Mammal Aerial Survey Area

Landbase Data

Provincial Road / Highway

Railway

Coordinate System: NAD 1983 UTM Zone 14N
Data Source: MB Hydro, Joro, ESRI, NRCAN
Date Created: Nov 9, 2021

N

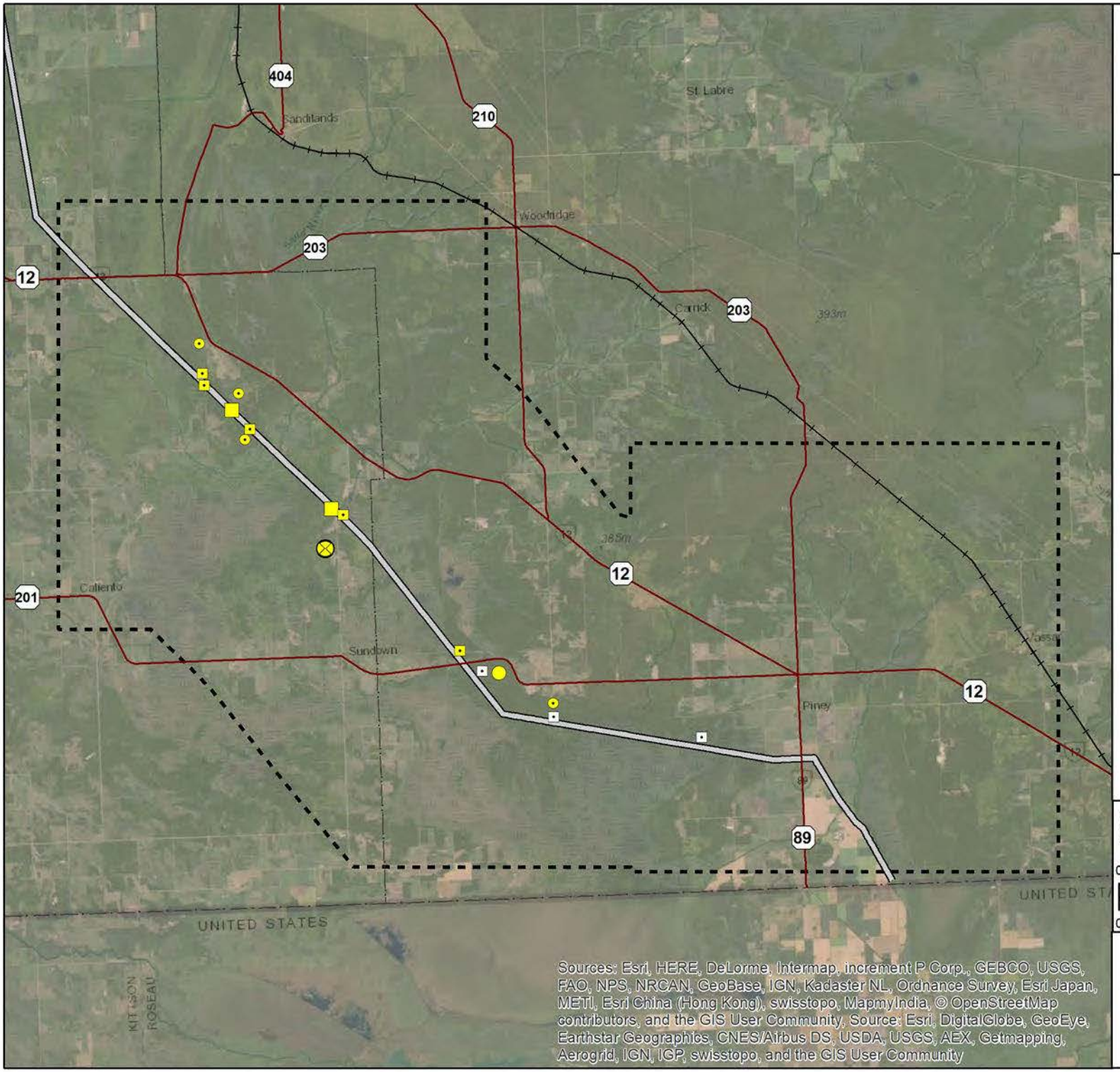
0 6 Kilometers

1:250,000

0 3 6 Miles

## Camera Trap Results 2019-2020 White-tailed Deer - Summer

Map 5




Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Manitoba Hydro

Joro Consultants

**Manitoba - Minnesota Transmission Project**

**White-tailed Deer RAI Values (Winter)**

| Control | | Affected |
|---|---|---|
| ⊙ | 0.00 | ⊡ |
| ⊙ | >0 - 0.25 | ⊡ |
| ● | 0.26 - 0.50 | ■ |
| ⊗ | 0.51 - 0.75 | ⊠ |
| ● | >0.75 | ■ |

Mammal Survey Area

MMTP Transmission Line

Mammal Aerial Survey Area

Landbase Data

Provincial Road / Highway

Railway

Coordinate System: NAD 1983 UTM Zone 14N
Data Source: MB Hydro, Joro, ESRI, NRCAN
Date Created: Nov 9, 2021

N

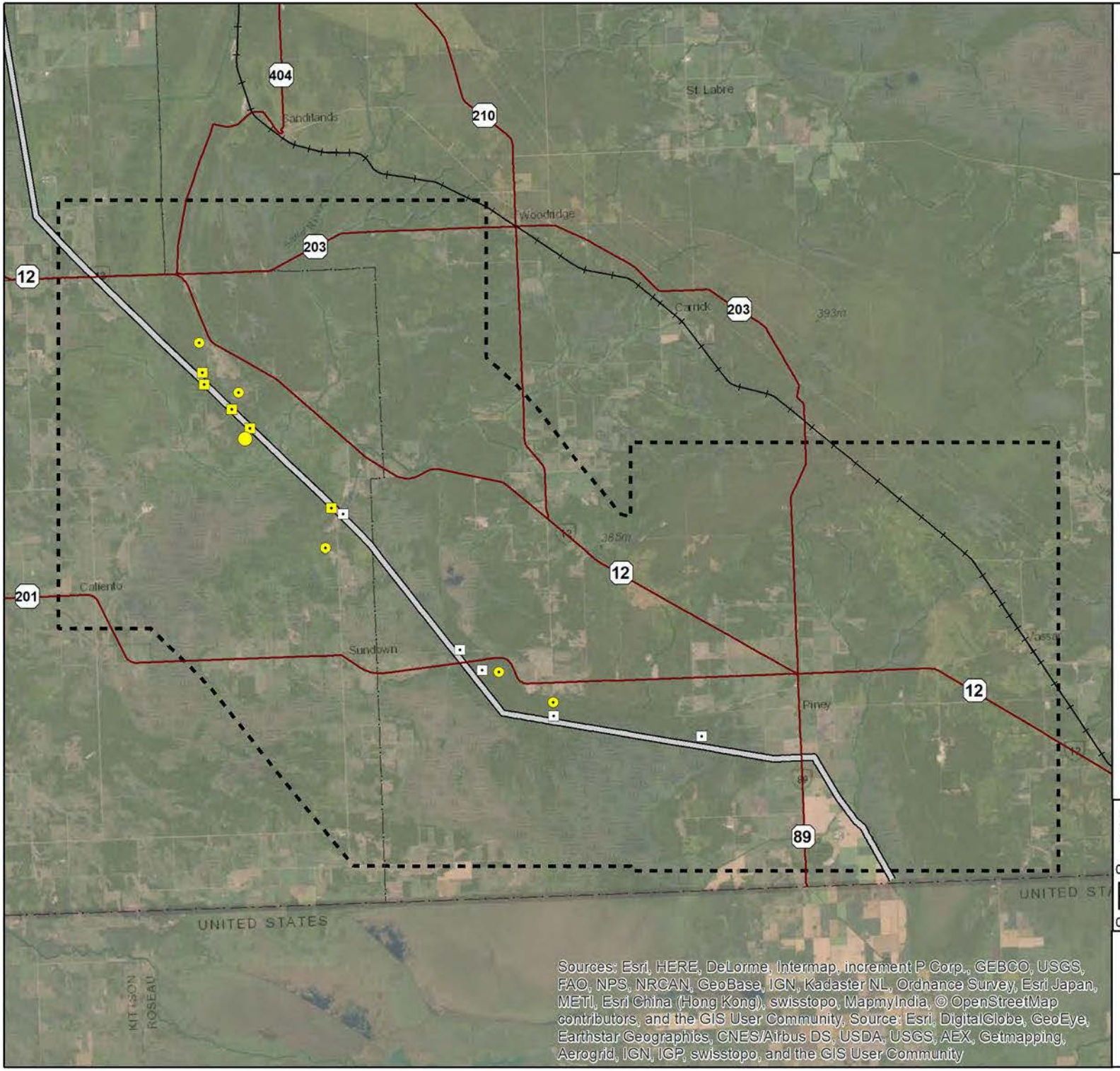
0 6 Kilometers

1:250,000

0 3 6 Miles

**Camera Trap Results 2019-2020**
**White-tailed Deer - Winter**

Map 6




Manitoba Hydro

Joro Consultants

# Manitoba - Minnesota Transmission Project

## Black Bear RAI Values (Summer)

| Control | | Affected |
|---|---|---|
| ⊙ | 0.00 | ⊡ |
| ⊙ | >0 - 0.25 | ⊡ |
| ● | 0.26 - 0.50 | ■ |
| ⊗ | 0.51 - 0.75 | ⊠ |
| ● | >0.75 | ■ |

Mammal Survey Area

MMTP Transmission Line

Mammal Aerial Survey Area

Landbase Data

Provincial Road / Highway

Railway

Coordinate System: NAD 1983 UTM Zone 14N
Data Source: MB Hydro, Joro, ESRI, NRCAN
Date Created: Nov 9, 2021

N

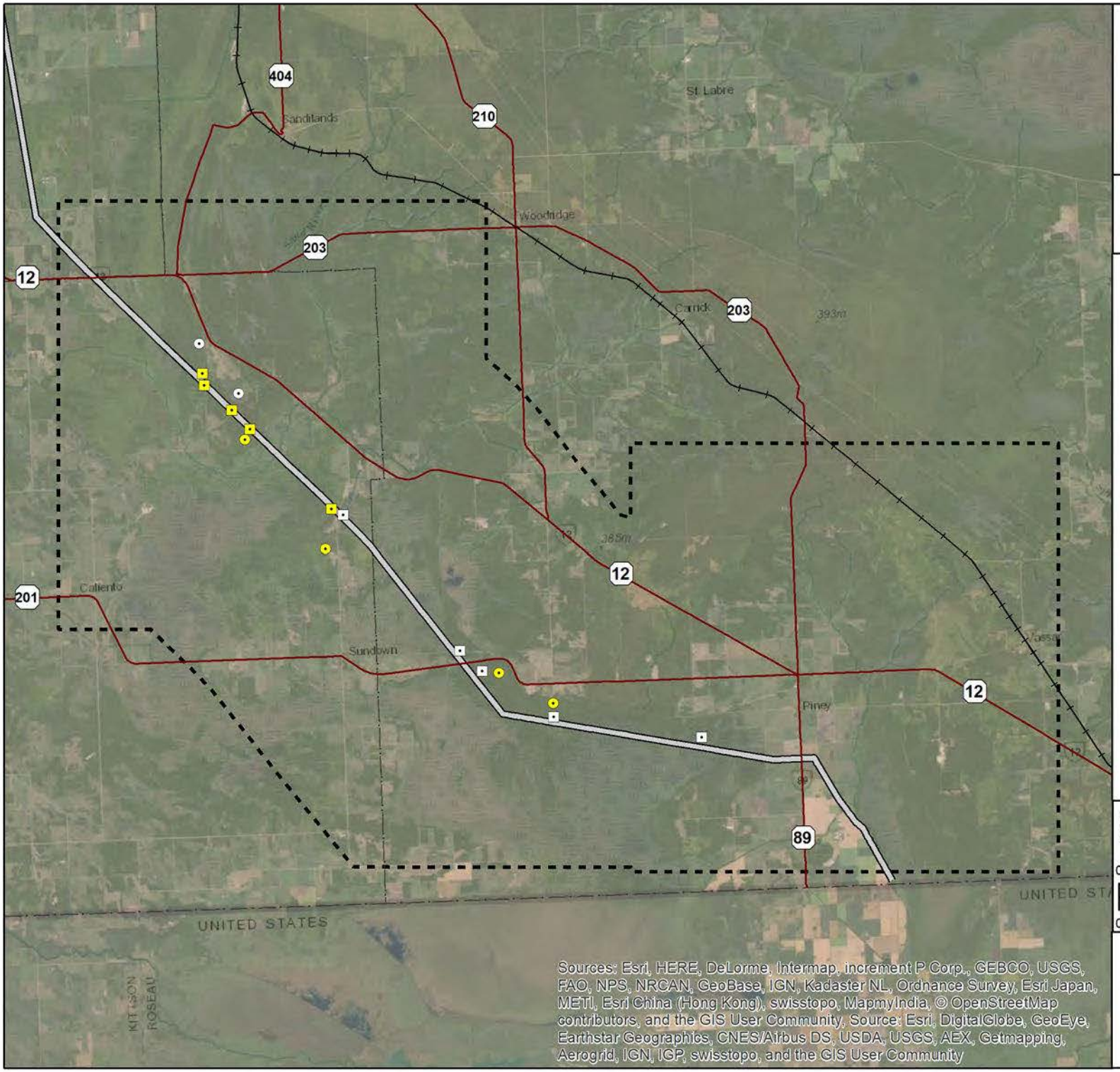
0 6 Kilometers

1:250,000

0 3 6 Miles

## Camera Trap Results 2019-2020 Black Bear

Map 7




Manitoba Hydro

Joro Consultants

**Manitoba - Minnesota Transmission Project**

**Gray Wolf RAI Values**

| Control | | Affected |
|---|---|---|
| | 0.00 | |
| | >0 - 0.25 | |
| | 0.26 - 0.50 | |
| | 0.51 - 0.75 | |
| | >0.75 | |

Mammal Survey Area

MMTP Transmission Line

Mammal Aerial Survey Area

Landbase Data

Provincial Road / Highway

Railway

Coordinate System: NAD 1983 UTM Zone 14N
Data Source: MB Hydro, Joro, ESRI, NRCAN
Date Created: Nov 9, 2021

N

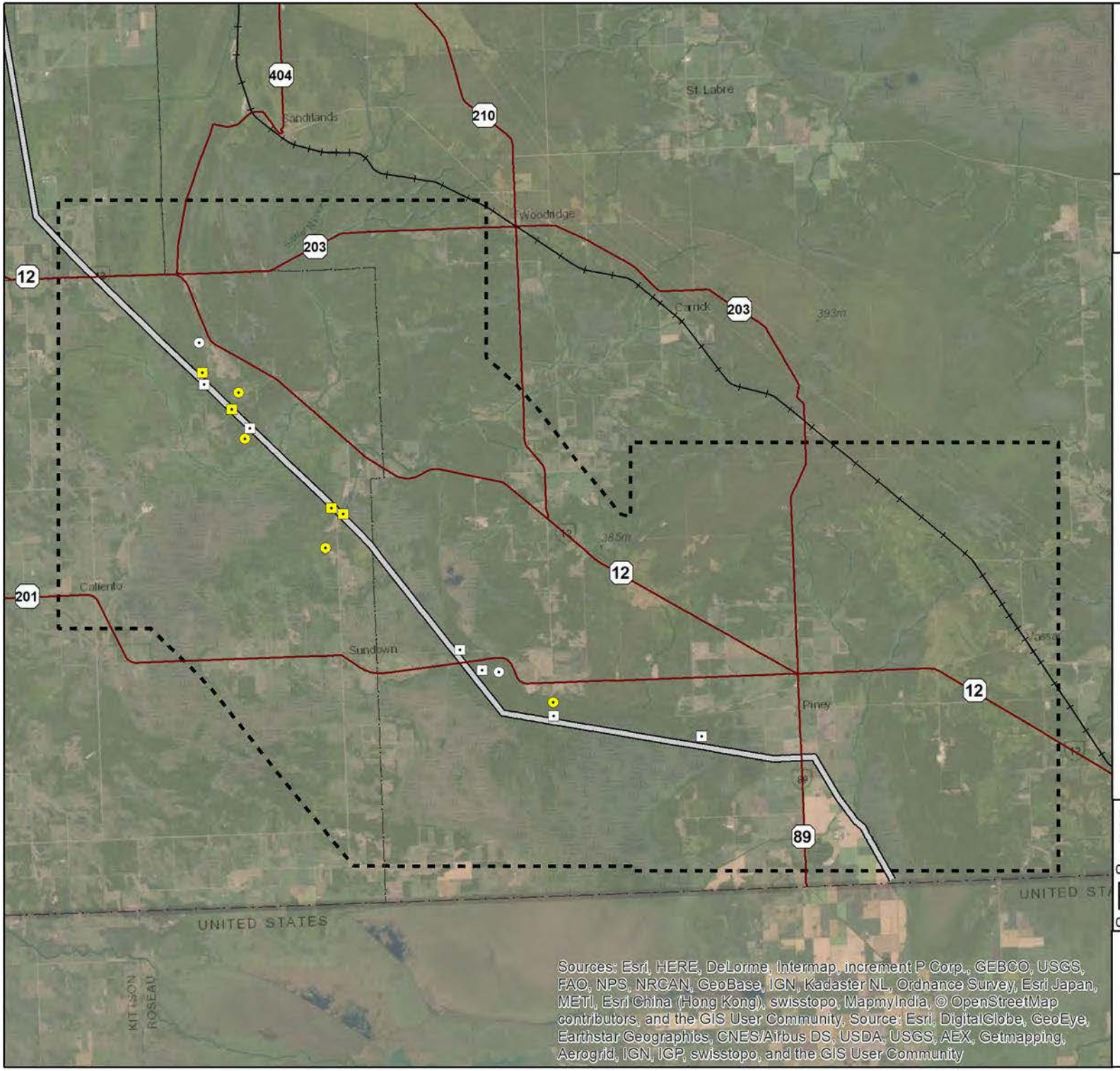
0 6 Kilometers

1:250,000

0 3 6 Miles

**Camera Trap Results 2019-2020 Gray Wolf**

Map 8




Manitoba Hydro

Joro Consultants

# Manitoba - Minnesota Transmission Project

## Coyote RAI Values

| Control | | Affected |
|---|---|---|
| ⊙ | 0.00 | ⊡ |
| ⊙ | >0 - 0.25 | ⊡ |
| ● | 0.26 - 0.50 | ■ |
| ⊗ | 0.51 - 0.75 | ⊠ |
| ● | >0.75 | ■ |

Mammal Survey Area

MMTP Transmission Line

Mammal Aerial Survey Area

Landbase Data

Provincial Road / Highway

Railway

Coordinate System: NAD 1983 UTM Zone 14N
Data Source: MB Hydro, Joro, ESRI, NRCAN
Date Created: Nov 9, 2021

N

0 6 Kilometers

1:250,000

0 3 6 Miles

## Camera Trap Results 2019-2020 Coyote

Map 9

# APPENDIX 2: TABLES

**Appendix 2, Table 1: Summary of the MMTP 2019-2020 mammal camera trap study results**

| Camera ID | Treatment | Season | Year | No. of Operation Days | White-tailed Deer | | | Black Bear | | | Gray Wolf | | | Coyote | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI |
| MMTP_LTM_12 | Affected | winter | 2018-19 | 181 | 9 | 5 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_LTM_12 | Affected | summer | 2019 | 184 | 4 | 4 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_LTM_12 | Affected | winter | 2019-20 | 182 | 3 | 3 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_LTM_12 | Affected | summer | 2020 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_002 | Affected | winter | 2018-19 | 181 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_002 | Affected | summer | 2019 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_002 | Affected | winter | 2019-20 | 182 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_002 | Affected | summer | 2020 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_005 | Affected | winter | 2018-19 | 181 | 17 | 12 | 0.07 | 2 | 2 | 0.01 | 9 | 8 | 0.04 | 2 | 2 | 0.01 |
| MMTP_MONITORING_005 | Affected | summer | 2019 | 184 | 5 | 2 | 0.01 | 10 | 8 | 0.04 | 1 | 1 | 0.01 | 0 | 0 | 0.00 |
| MMTP_MONITORING_005 | Affected | winter | 2019-20 | 182 | 5 | 5 | 0.03 | 1 | 1 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_005 | Affected | summer | 2020 | 184 | 2 | 2 | 0.01 | 4 | 4 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_006 | Control | winter | 2018-19 | 181 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_006 | Control | summer | 2019 | 184 | 2 | 1 | 0.01 | 3 | 3 | 0.02 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_006 | Control | winter | 2019-20 | 182 | 16 | 15 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |

| Camera ID | Treatment | Season | Year | No. of Operation Days | White-tailed Deer | | | Black Bear | | | Gray Wolf | | | Coyote | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI |
| MMTP_MONITORING_006 | Control | summer | 2020 | 184 | 1 | 1 | 0.01 | 5 | 5 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_007 | Affected | winter | 2018-19 | 181 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_007 | Affected | summer | 2019 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_007 | Affected | winter | 2019-20 | 182 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_007 | Affected | summer | 2020 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_008 | Control | winter | 2018-19 | 181 | 50 | 30 | 0.17 | 0 | 0 | 0.00 | 3 | 3 | 0.02 | 10 | 8 | 0.04 |
| MMTP_MONITORING_008 | Control | summer | 2019 | 184 | 71 | 40 | 0.22 | 8 | 7 | 0.04 | 1 | 1 | 0.01 | 0 | 0 | 0.00 |
| MMTP_MONITORING_008 | Control | winter | 2019-20 | 182 | 2 | 2 | 0.01 | 0 | 0 | 0.00 | 1 | 1 | 0.01 | 1 | 1 | 0.01 |
| MMTP_MONITORING_008 | Control | summer | 2020 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_011 | Affected | winter | 2018-19 | 181 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_011 | Affected | summer | 2019 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_011 | Affected | winter | 2019-20 | 182 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_011 | Affected | summer | 2020 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_012 | Control | winter | 2018-19 | 181 | 42 | 36 | 0.20 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_012 | Control | summer | 2019 | 184 | 34 | 29 | 0.16 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_012 | Control | winter | 2019-20 | 182 | 78 | 62 | 0.34 | 0 | 0 | 0.00 | 5 | 3 | 0.02 | 0 | 0 | 0.00 |
| MMTP_MONITORING_012 | Control | summer | 2020 | 184 | 18 | 15 | 0.08 | 1 | 1 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_015 | Affected | winter | 2018-19 | 181 | 110 | 67 | 0.37 | 0 | 0 | 0.00 | 3 | 2 | 0.01 | 5 | 4 | 0.02 |

| Camera ID | Treatment | Season | Year | No. of Operation Days | White-tailed Deer | | | Black Bear | | | Gray Wolf | | | Coyote | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI |
| MMTP_MONITORING_015 | Affected | summer | 2019 | 184 | 79 | 66 | 0.36 | 7 | 6 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_015 | Affected | winter | 2019-20 | 182 | 55 | 37 | 0.20 | 4 | 1 | 0.01 | 10 | 7 | 0.04 | 4 | 4 | 0.02 |
| MMTP_MONITORING_015 | Affected | summer | 2020 | 169 | 57 | 46 | 0.27 | 2 | 2 | 0.01 | 0 | 0 | 0.00 | 2 | 2 | 0.01 |
| MMTP_MONITORING_017 | Affected | winter | 2018-19 | 181 | 14 | 14 | 0.08 | 1 | 1 | 0.01 | 0 | 0 | 0.00 | 5 | 5 | 0.03 |
| MMTP_MONITORING_017 | Affected | summer | 2019 | 184 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_017 | Affected | winter | 2019-20 | 182 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_017 | Affected | summer | 2020 | 154 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_018 | Control | winter | 2018-19 | 181 | 235 | 141 | 0.78 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_018 | Control | summer | 2019 | 184 | 345 | 228 | 1.24 | 9 | 5 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_018 | Control | winter | 2019-20 | 182 | 137 | 78 | 0.43 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 3 | 3 | 0.02 |
| MMTP_MONITORING_018 | Control | summer | 2020 | 139 | 218 | 162 | 1.17 | 6 | 6 | 0.04 | 2 | 1 | 0.01 | 1 | 1 | 0.01 |
| MMTP_MONITORING_019 | Affected | winter | 2018-19 | 181 | 1 | 1 | 0.01 | 6 | 6 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_019 | Affected | summer | 2019 | 126 | 9 | 8 | 0.06 | 32 | 29 | 0.23 | 1 | 1 | 0.01 | 0 | 0 | 0.00 |
| MMTP_MONITORING_020 | Control | winter | 2018-19 | 181 | 19 | 18 | 0.10 | 2 | 2 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_020 | Control | summer | 2019 | 184 | 95 | 82 | 0.45 | 28 | 25 | 0.14 | 8 | 6 | 0.03 | 4 | 4 | 0.02 |
| MMTP_MONITORING_020 | Control | winter | 2019-20 | 182 | 30 | 22 | 0.12 | 8 | 4 | 0.02 | 4 | 4 | 0.02 | 0 | 0 | 0.00 |
| MMTP_MONITORING_020 | Control | summer | 2020 | 184 | 44 | 36 | 0.20 | 158 | 133 | 0.72 | 0 | 0 | 0.00 | 2 | 2 | 0.01 |
| MMTP_MONITORING_021 | Affected | winter | 2018-19 | 181 | 75 | 51 | 0.28 | 4 | 4 | 0.02 | 3 | 2 | 0.01 | 2 | 2 | 0.01 |

| Camera ID | Treatment | Season | Year | No. of Operation Days | White-tailed Deer | | | Black Bear | | | Gray Wolf | | | Coyote | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI | No. of Individuals | No. of Events | RAI |
| MMTP_MONITORING_021 | Affected | summer | 2019 | 126 | 24 | 14 | 0.11 | 7 | 6 | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_022 | Control | winter | 2018-19 | 181 | 26 | 21 | 0.12 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_022 | Control | summer | 2019 | 184 | 24 | 21 | 0.11 | 7 | 7 | 0.04 | 0 | 0 | 0.00 | 1 | 1 | 0.01 |
| MMTP_MONITORING_022 | Control | winter | 2019-20 | 182 | 17 | 15 | 0.08 | 0 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_022 | Control | summer | 2020 | 184 | 6 | 6 | 0.03 | 7 | 6 | 0.03 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_023 | Affected | winter | 2018-19 | 181 | 29 | 19 | 0.10 | 0 | 0 | 0.00 | 1 | 1 | 0.01 | 0 | 0 | 0.00 |
| MMTP_MONITORING_023 | Affected | summer | 2019 | 184 | 72 | 60 | 0.33 | 9 | 9 | 0.05 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |
| MMTP_MONITORING_023 | Affected | winter | 2019-20 | 182 | 4 | 3 | 0.02 | 0 | 0 | 0.00 | 4 | 3 | 0.02 | 0 | 0 | 0.00 |
| MMTP_MONITORING_023 | Affected | summer | 2020 | 184 | 28 | 25 | 0.14 | 2 | 1 | 0.01 | 0 | 0 | 0.00 | 0 | 0 | 0.00 |

# APPENDIX H

D1910

# MANITOBA HYDRO

INTEROFFICE MEMORANDUM

**FROM** Jim Keil
Station Construction Department Manager
Station Construction Department
Asset Planning & Delivery

**TO** James Matthewson
Manager
Licensing & Environmental Assessment
Project Management

---

**DATE** 2021 12 10

**SUBJECT** **MANITOBA-MINNESOTA TRANSMISSION PROJECT TRAFFIC ACCIDENTS AND NEAR MISSES IN THE PROJECT AREA**

In response to the requirements of the sections 4.6.2.1 and 7.5.1 of the Manitoba-Minnesota Transmission Project Environmental Monitoring plan, the Construction Services Department is able to provide the following information on traffic accidents and near misses in the project area on key roadways through Manitoba Hydro incident reports.

In total, eleven traffic incidents occurred over the course of the construction phase of the Project. Two incidents occurred with Manitoba Hydro vehicles, and the remainder with contractor vehicles. Minor injuries were sustained in two incidents. No major injuries or fatalities occurred.

Project safety protocols that contributed to minimize the rate traffic incidents can be attributed to:

- Mandatory safety training for all staff;
- Development and adherence to the approved MMTP Construction Access Management Plan;
- Employment of safety officers by Manitoba Hydro and contractors;
- Contractor safety management plans

Below is a summary table of all traffic incidents and near misses.

Sincerely,

[redacted]

Jim Keil, P. Eng
Station Construction Department Manager
Station Construction Department
Asset Planning & Delivery

| INCIDENT DATE (yyyy-mm-dd) | WORKPLACE SAFETY INCIDENT FILE # | PROJECT | INCIDENT DETAIL: Near Miss | No Lost Time | Lost Time (LTI) Days Lost (LTD) | Serious | Vehicle | Property/Equipt | CEA Reportable | DESCRIPTION (Include only generic (non-personal) information here. This column is intended to be shared and printed openly. Identify details such as: Incident report # (if internal) ● Specify if medical attention required (and identify facility attended) ● Describe return-to-work accommodation (modified / light duties) if applicable) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2019-11-24 | | MMTP Section 2 | | | | | X | | | semi truck was turning at intersection of 54N and 37E (Richland Rd and Eastdale Rd) as trailer slide into ditch damaging municipal sign. |
| 2019-11-25 | 3883 | MMTP Section 1 | | | | | X | | | employee driving MB Hydro vehicle had right of way and collided with MH personel vehicle that pulled through stop sign at Dorsey Station |
| 2019-11-26 | | MMTP Section 2 | | | | | X | | | Tractor Trailer unit hauling material to STR 278 turned at municipal road 42 E and 46 N intersection and slide into ditch. |
| 2019-12-05 | | MMTP Section 2 | | | | | X | | | Two contractor welding trucks driving east on Mun Rd. First truck slows down to turn on Dominic Rd. Second truck following tries to stop and is unable to come to a stop. Operator of second truck contacts first truck from behind. Road conditions were extremely icy. Driver of second truck operating too fast for road conditions. No injuries. |
| 2019-12-18 | | MMTP Section 1 | | | | | X | | | While travelling down a municiple road, The operator of a loader failed to yield at an uncontrolled intersection and made contact with a semi-truck and trailer resulting in damage to the semi-trailer. No injuries to either driver. |
| 2020-01-13 | | MMTP Section 2 | | | | | X | | | Fuel delivery worker driving south on HWY 12. Driver felt vibration, driver proceeded to slow down. Driver side rear duals separated from 550 truck. Driver stopped safely on shoulder of HWY. Driver secured the scene. |
| 2020-01-24 | | MMTP Section 2 | | | | | X | | | Crew was traveling East on HW 52 towards the contractor's camp in a Ford 350 1 Ton. With just a couple of KMs to go before they reached the camp the driver noticed something hit the windshield and then suddenly the front drivers side wheel came off causing the truck to swerve into the opposite lane and then back across the road before the driver could bring the truck to a stop on the shoulder. |
| 2020-02-02 | | MMTP Section 1 | | | | | X | | | Collision occurred at an uncontrolled intersection while contractor vehicle was travelling east on mission road at 37km/h according to the GPS while a third party vehicle was travelling North on Poplar road travelling approximately 80km/h. The driver of the third party vehicle stated that they saw the contractor vehicle but did not slow down because they thought the contractor driver would yield. The contractor did not see the third party vehicle and continued on their path of Travel, contacting the driver's door of the third party vehicle causing it to roll over as the contractor vehicle entered the ditch. Minor injuries were sustained as police and ambulance arrive on site due to vehicle On-Star collision notification. |
| 2020-02-14 | | MMTP Section 2 | | | | | X | | | A digger truck hauling tension fiber trailer heading North on Hwy 12 left the road at the intersection of Hwy 12 and Richland Rd ending up in the ditch on the opposite side of the rd. |
| 2020-03-07 | | MMTP Section 2 | | | | | X | | | Sub-Contractor hauling mats with a semi and loaded B train trailers contacted CN rail train on RD 34N. No worker injury. Front end damage occurred to the semi-truck. The semi and trailer was driven to the contractor yard site after incident. The semi driver was turning east off HWY 210 on to RD 34N. CN rail line parallels HWY 210. The semi driver was concerned with turning the 120-degree corner and as the unit was making the turn, the semi driver was looking in their mirror to make sure the trailers were going to stay on the road surface. Once the turn was completed the semi driver realized the east bound CN train was entering the uncontrolled intersection on RD 34N. The semi driver proceeded to stop the unit but failed to do so in time. The CN train contacted the driver side front bumper and fender of the semi-tractor unit. Scene secured and cleared. |
| 2020-04-27 | 4288 | MMTP Section 2 | | | | | X | | | At approximately 1pm the employee was driving east down road 20N towards structure 376 doing about 50 km/h when a deer come out of steep ditch from their right side. The employee was able to slow down a bit, but deer made contact with front end drivers side bumper. The deer was pushed to ditch on left side of road where it died. Damage to truck was minimal. Black plastic covering was broken along with bracket with heater core extension cord. |

# APPENDIX I

Manitoba Hydro

360 Portage Avenue (5) • Winnipeg, Manitoba Canada • R3C 0G8
(204) 360-3119 • jmatthewson@hydro.mb.ca

February 28, 2020

Robert Wheeldon
Parkland Mews
P.O. Box 321, Station Saint Norbert
Winnipeg, MB, R3V 1L7

Dear Dr., Wheeldon:

**RE: MMTP and Monitoring at the Parkland Mews**

Manitoba Hydro is contacting you to further discuss monitoring of the potential effects of the Manitoba-Minnesota Transmission Project (MMTP) on the Parkland Mews - Peregrine Falcon Conservation Centre. As discussed in our previous correspondence dated August 25, 2016, and outlined in the MMTP Environmental Monitoring Plan, Manitoba Hydro would like to support post-construction monitoring of peregrine falcon flights in relation to the Project.

Manitoba Hydro has a long history of supporting Parkland Mews and peregrine falcon conservation in Manitoba. At this time however, we are looking to focus the monitoring on the potential effects of MMTP on otherwise normal peregrine falcon flying activities carried out at your facility. As outlined in the MMTP Environmental Monitoring Plan, this is focused on tracking movements of peregrine falcons around your facility to better understand flight distances, perching sites, and project crossing rates. Further details can be found on pages 82 and 119 of the MMTP Environmental Monitoring Plan here: https://www.hydro.mb.ca/projects/mb_mn_transmission/pdfs/epp_environmental_monitoring_plan.pdf.

As outlined in our letter dated August 25, 2016, Manitoba Hydro has already supplied the necessary GPS tracking equipment and received pre-construction data reports from you describing peregrine falcon flight movements. In order to compensate Parkland Mews for the necessary time and effort to conduct this post-construction tracking and data sharing in 2020, Manitoba Hydro is prepared to provide up to $5,000 in funding. This funding would compensate for the labor and incidental expenses related to gathering peregrine falcon tracking data from otherwise normally scheduled or planned peregrine falcon flights at Parkland Mews. Incidental costs would include items such as replacement transmitters or batteries. Manitoba Hydro would only require a single data submission in fall 2020, however, we would request any information on Project interactions be reported as soon as possible.

Please advise if you are interested in continuing your efforts with Manitoba Hydro to understand the interaction of your operations with our new infrastructure. Depending on your preference we could develop a formal contribution agreement and provide funding prior to the summer, or we could arrange to expect an invoice from Parkland Mews in fall 2020.

[redacted]

James Matthewson
Licensing and Environmental Assessment Department

Manitoba Hydro

360 Portage Avenue (5) • Winnipeg, Manitoba Canada • R3C 0G8
(204) 360-3119 • jmatthewson@hydro.mb.ca

January 12th, 2021

Robert Wheeldon
Parkland Mews
P.O. Box 321, Station Saint Norbert
Winnipeg, MB, R3V 1L7

Dear Dr., Wheeldon:

**RE: MMTP and Monitoring at the Parkland Mews**

Manitoba Hydro is contacting you to follow up on our letter dated February 28th, 2020. In that letter (attached) we outlined opportunities for further monitoring the interaction of the peregrine falcons at your facility with our new infrastructure, as per the Manitoba Minnesota Transmission Project - Environmental Monitoring Plan.

We understand that health concerns and the development of the COVID-19 pandemic may have had an impact on your operations. As we did not receive a funding proposal, data submission or invoice we are uncertain if you are interested in continuing your efforts with Manitoba Hydro to understand the interaction of your operations with our new infrastructure. If you did collect movement data from your peregrine falcons in 2020, we would be open to accepting that data, and providing compensation as per a new agreement and invoice.

As supplemental information, we did not observe any interactions between peregrine falcons and the MMTP project as part of environmental inspections during the construction period.

Due to the events of 2020, Manitoba Hydro is interested in extending the opportunities as described in the February 28th, 2020 letter to Parkland Mews for its operations during the summer of 2021, please contact us if you are interested in pursuing this option.

Regards,

"original signed by"

James Matthewson
Licensing and Environmental Assessment Department

Attach: 1

cc: Elise Dagdick, Environmental Approvals Branch