

Birtle Transmission Project

Grasslands offset plan for impacts to grassland bird habitat in the Spy Hill-Ellice Community Pasture

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Licensing & Environmental Assessment Department

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Number	Nature of revision	Section(s)	Revised by	Date

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Preface

This document presents a grassland offset plan for impacts to grassland bird habitat in the Spy Hill-Ellice Community Pasture (the Plan) for the development of the Birtle Transmission Project (the Project).

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1.0 Purpose

The purpose of this plan is to fulfill the requirements of the following:

- Condition 17 of the Environment Act Licence #3314 (received January 14th, 2020).

This plan includes a description of:

- the grassland bird habitat area impacted by the transmission line right-of-way in the Spy Hill-Ellice Community Pasture;
- mitigation measures to minimize potential effects of the Project on grassland bird habitat in Spy Hill-Ellice Community Pasture;
- offset measures for impacts to grassland bird habitat in Spy Hill-Ellice Community Pasture;
- monitoring potential effects of the Project on grasslands and grassland bird habitat in Spy Hill-Ellice Community Pasture.

Additional documentation outlining Manitoba Hydro's commitment to grassland protection, mitigation, rehabilitation and monitoring for the Project are outlined in:

- The BTP Environmental Assessment (Manitoba Hydro 2018);
- The BTP Construction Environmental Protection Plan (Manitoba Hydro 2020);
- The BTP Construction Environmental Protection Plan Mapbook (Manitoba Hydro 2020);
- The BTP Rehabilitation and Invasive Species Management Plan (Manitoba Hydro 2020);
- The BTP Environmental Monitoring Plan (Manitoba Hydro 2020);
- Throughout the Birtle Transmission Project Environment Act licensing process (Province of Manitoba 2019)

2.0 Legal framework

This Plan follows the legal requirements dictated under condition # 17 and Schedule A of Environment Act Licence #3314, which outlines the following:

17) The Licencee shall enter into an agreement with the Wildlife and Fisheries Branch of Agriculture and Resource Development and the Manitoba Habitat Heritage Corporation for an offset contribution for the impacts to grasslands associated with the Development. The Licencee shall develop a grassland offset plan for impacts to grassland bird habitat in the Spy Hill-Ellice Community Pasture that includes a description of area impacted by the transmission line right-of-way, offset ratio, and mitigation measures to be implemented during construction in accordance with the values specified in Schedule A of this Licence. The offset contribution will be held by the Manitoba Habitat Heritage Corporation and may be used for securement of perpetual conservation agreements for

grasslands on private land, or other mechanisms to be approved by the Director of the Environmental Approvals Branch in consultation with officials responsible for The Endangered Species and Ecosystems Act.

Schedule A

Offset Calculation:

An offset ratio of 4: 1 is appropriate given the uniqueness of the habitat type and high densities of endangered grassland birds in the area.

Area of Influence	Offset Ratio	Area	Per Hectare Cost	Required Offset Contribution
New grassland edge created by project	Multiplier to achieve no net loss of grassland area and function	Area of Influence (13.6 HA) x offset multiplier	For grassland rehabilitation	Offset Contribution area x per hectare cost
13.6 HA	4:1	54.4 HA	\$17,500	\$952,000

3.0 Introduction

Manitoba Hydro is committed to compensation for loss of grassland bird habitat as part of the Birtle Transmission Project (BTP) by providing grassland offsets. To achieve this Manitoba Hydro will use the calculations described in Appendix A of the Environment Act licence #3314. Manitoba Hydro will enter into an agreement with the Wildlife and Fisheries Branch of the Agriculture and Resource Development and the Manitoba Habitat Heritage Corporation and provide a total of \$952,000 as an offset contribution for the impacts to grassland associated with the Project. This monetary payment by Manitoba Hydro in fulfillment of this grassland offset for the Project will be held in trust for projects dedicated to restoring or enhancing grasslands in Manitoba.

4.0 Project description

The Birtle Transmission Project includes the construction, operation and maintenance of a new 230kV transmission line located between Birtle South Station and the Manitoba border. Further details are outlined in Chapter 1 and 2 of the BTP Environmental Assessment.

5.0 Grassland mitigation measures

Mitigating for impacts to grassland bird habitat includes following the conservation mitigation hierarchy (Manitoba Sustainable Development 2018, BC Ministry of Environment 2010, Alberta Government 2007). Table 1 outlines of how this plan fulfills the conservation mitigation hierarchy for grassland bird habitat.

Table 1. Mitigation measures and offsets for impacts to grassland bird habitat in the Spy Hill-Ellice Community Pasture

Mitigation hierarchy for impacts to grassland bird habitat	Site-specific details and maps	Mitigation measures to be implemented include (but are not limited to) the following:	Project document where details are described	Decision-making criteria for selecting specific mitigation or offset measures and offset ratios	Schedule for when measure is implemented and completed
Avoidance	Within the Spy Hill Ellice Community Pasture as outlined in map 1.	<ul style="list-style-type: none"> • Route selection and constraint mapping considered the location and importance of grasslands. • Additional project length and transmission towers to avoid open grasslands in Spy Hill Ellice Community Pasture 	Chapter 6 of the BTP Environmental Assessment	Identified as industry best practice by Manitoba Sustainable Development 2018, BC Ministry of Environment 2010, Alberta Environment 2007	Pre-construction phase (completed)
Minimization	All grasslands identified as environmentally sensitive sites within the BTP Construction Environmental Protection Plan and Map book.	<ul style="list-style-type: none"> • Disturbance of grasslands will only be carried out under frozen ground conditions. • Installation of perch deterrents on all towers in Spy Hill Ellice Community Pasture • Installation of bird diverters on spans in grassland in Spy Hill Ellice Community Pasture 	BTP Construction Environmental Protection Plan, BTP Construction Environmental Protection Plan Mapbook	Identified as industry best practice by Manitoba Sustainable Development 2018, BC Ministry of Environment 2010, Alberta Environment 2007, Environment Act Licence #3114	Construction phase
Rehabilitation	All grasslands identified as environmentally sensitive sites in the BTP Construction Environmental Protection Plan Mapbook that are identified as requiring rehabilitation as per the Environmental Monitoring Plan.	<ul style="list-style-type: none"> • Flag or place barriers to mitigate further disturbance • Implementation of erosion and sediment control measures where required • Allow passive revegetation through natural regrowth of native/traditional species • If passive revegetation is not successful, implement active revegetation through planting or seeding of native/traditional species 	BTP Construction Environmental Protection Plan, BTP Rehabilitation and Invasive Species Management Plan, BTP Environmental Monitoring Plan	Identified as industry best practice by Manitoba Sustainable Development 2018, BC Ministry of Environment 2010, Alberta Environment 2007	Based on conditions and as outlined in the BTP Construction Environmental Protection Plan, BTP Rehabilitation and Invasive Species Management Plan, BTP Environmental Monitoring Plan
Offsets	Grasslands within 100 meters of the Project in Spy Hill-Ellice Community Pasture as identified in map 1.	<ul style="list-style-type: none"> • Measure loss of grassland and grassland function • Calculate grassland loss compensation • Monetary compensation provided to Manitoba Habitat Heritage Corporation, as part of an agreement between Manitoba Hydro, the Wildlife and Fisheries Branch of Agriculture and Resource Development. 	BTP Grasslands Offset Measures Plan	As dictated under condition 16 and 17 and Appendix A of Environment Act licence #3314.	Within 30 days of signing a contribution agreement

5.1 Description of grassland bird habitat area

Grasslands in the Project area were identified using the best available digital imagery including land cover classification imagery, Forest Resource Inventory database, LiDAR, Agriculture and Agri-Food Radar imagery, and in-field data gathered while preparing the BTP Environmental Assessment. All grasslands in the Spy Hill Ellice Community Pasture were classified as environmentally sensitive sites within the BTP Construction Environmental Protection Plan Mapbook.

Endangered and threatened grassland birds such as Chestnut-collared longspur (*Calcarius ornatus*) and Sprague's pipit (*Anthus spragueii*) prefer open grassland areas and are known to avoid areas closer to edge features (i.e. trees and vertical infrastructure). Individual birds that do still reside within close proximity to edge features may be more susceptible to predation and nest parasitism (NABCI 2012, ECCC 2017a, ECCC 2017b). Therefore, it was determined that open grassland bird habitat within 100 m of Project centerline will be most affected by the Project.

To calculate impacted grassland bird habitat area, all environmentally sensitive sites in the Spy Hill-Ellice Community Pasture classified as grasslands in the BTP Construction Environmental Protection Plan Mapbook were overlaid in ArcGIS Desktop to the extent of the right-of-way footprint. A total of 134.3 hectares are within 100m of the Project in the Spy Hill-Ellice Community Pasture (Table 2). After accounting for existing edge features, an assessment determined that 13.6 hectares of new grassland edge will be created by Project (Table 3)(Map 1)(Appendix A). The 13.6 hectare impact area was used to determine the area of influence and the Projects impact to grassland bird habitat.

Table 2. Habitat type within 100 meters of the Birtle Transmission Project in Spy Hill-Ellice Community Pasture

Habitat Type	Hectares
Forest	42.1
Grassland	92.0
Water	0.2
Total	134.3

Table 3. Grassland habitat impacted by the Birtle Transmission Project in Spy Hill-Ellice Community Pasture

Grassland Habitat impacted by Project	Hectares
Grassland edge pre-impact 100m buffer	78.4
New grassland edge created by Project	13.6
Total	92.0

5.2 Grassland offset ratio and per hectare cost

Biodiversity offsets are being increasingly required to compensate for unavoidable habitat loss due to human development. The goal is to achieve a no net loss, neutral or positive outcome through the restoration of habitat. (Shaffer et al, 2019, Gibbons and Lindenmayer 2007, Kiesecker et al. 2009, Doherty et al. 2010, Maron et al. 2012).

To achieve a biodiversity offset, a multiplier ratio is typically applied to the calculated impacted area. Biodiversity offset ratios are not well defined in Canada and the majority have been developed around wetland habitat protection, not grassland habitats. In Manitoba, wetland offset ratios are required as per *The Water Rights Act*, and range between 2:1 and 3:1 (Province of Manitoba 2020).

Large intact grassland habitats are uncommon in Manitoba and in Canada. The grasslands of the Spy Hill–Ellice Community Pasture supports uniquely high densities of multiple species at risk (Manitoba Hydro 2020). Restoring or replacing grassland habitat is more difficult and more expensive than wetland restoration. Therefore, as per Appendix A of the Environment Act Licence #3314, a multiplier of 4:1 will be applied to this Project to help achieve no net loss of grassland area and function. 13.6 HA multiplied by a 4:1 offset ratio equates to 54.4 HA area to be offset.

Several options are available to achieve the offset objectives and may be used for securing conservation interests in lands approved by the Director of Environmental Approvals Branch in consultation with official's responsible for the *Endangered Species and Ecosystems Act*. Several of these options include:

- Acquisition of subsurface rights to provide permanent protection of surface lands, mixed grass prairie habitat.
- Acquisition of surface lands identified as mixed grass prairie.
- Delivery of perpetual conservation agreements for protection of grasslands.

The per cost hectare for grassland rehabilitation is defined in Appendix A of the Environment Act License as \$17,500. Manitoba Hydro will provide \$17,500 per hectare. Therefore, the total cost for grassland offset compensation for the Project is \$952,000.

Table 4. Grassland offset calculation for the Birtle Transmission Project.

Area of Influence	Offset Ratio	Area	Per Hectare Cost	Required Offset Contribution
New grassland edge created by project	Multiplier to achieve no net loss of grassland area and function	Area of Influence (13.6 HA) x offset multiplier	For grassland rehabilitation	Offset Contribution area x per hectare cost
13.6 HA	4:1	54.4 HA	\$17,500	\$952,000

Manitoba Hydro will schedule to allocate this compensation within 30 days of signing a contribution agreement.

5.3 Grassland monitoring

Impacts to grassland bird habitat will be monitored as part of the BTP Environmental Monitoring Plan (Manitoba Hydro 2020). The objectives of the BTP Environmental Monitoring Plan are to validate environmental assessment predictions, verify implementation of mitigation measures, and to allow for adaptive management. Pre-construction, construction and post-construction monitoring will focus on the following valued components of grassland habitats:

- Bird Species of Conservation Concern
- Plant Species of Conservation Concern
- Invasive Plant Species
- Traditional Use Plants

This monitoring program will be conducted by qualified specialists. Any resulting accidental loss to grasslands identified under this monitoring will be quantified and reported as per the BTP Environmental Monitoring Plan.

6.0 Summary

An assessment was conducted of the Birtle Transmission Project to determine the impact to grassland bird habitat in the Spy Hill-Ellice Community Pasture. After considering Project commitments towards applying avoidance, minimization, and restoration the extent of grassland bird habitat impacted was calculated based on new grassland edge created by the Project (13.6 ha). As per the valuations dictated in the Environment Act licence, Manitoba Hydro will apply the 4:1 compensation ratio at a

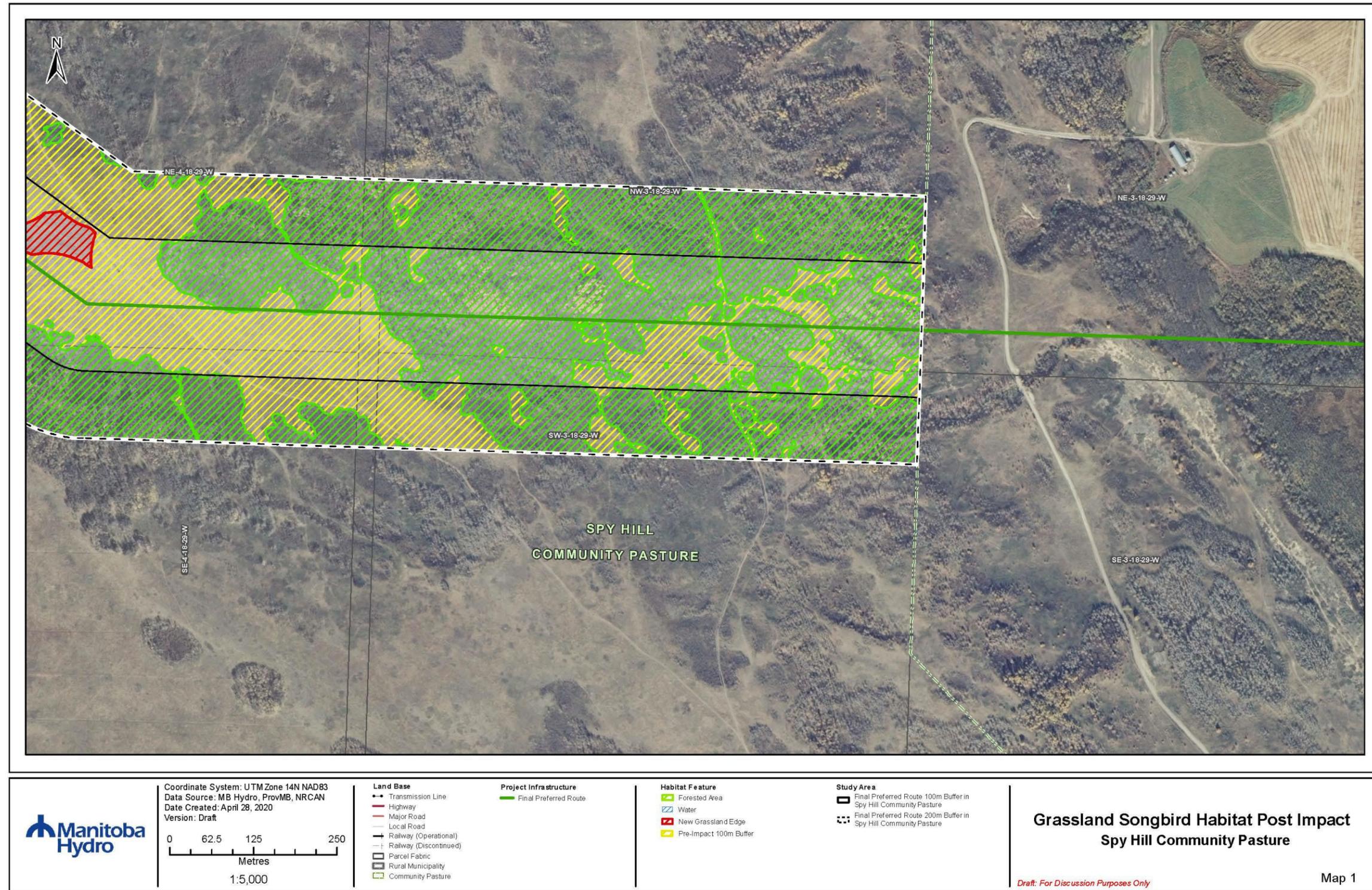
rehabilitation cost of \$17,500 per hectare. Manitoba Hydro will enter into an agreement with the Wildlife and Fisheries Branch of the Agriculture and Resource Development and the Manitoba Habitat Heritage Corporation and provide a total of \$952,000 as an offset contribution for the impacts to grassland associated with the Project. In addition to the \$952,000 offset to grassland impacts, and as required under condition 16 of the Environment Act licence, Manitoba Hydro will enter into an agreement to provide a one time \$150,000.00 contribution toward the capital costs of establishing a grassland habitat recovery program for the Spy-Hill Ellice Community Pasture. This process demonstrates Manitoba Hydro's commitment towards the goal of no net loss of grasslands and grassland function as part of the Project.

7.0 References

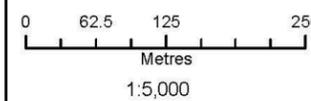
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Shaffer, Jill A., Charles R. Loesch, and Deborah A. Buhl. "Estimating offsets for avian displacement effects of anthropogenic impacts." *Ecological Applications* 29.8 (2019): e01983.

Map 1. Grassland bird habitat in the Spy Hill-Ellice Community Pasture



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: April 28, 2020
 Version: Draft



- Land Base**
- Transmission Line
 - Highway
 - Major Road
 - Local Road
 - Railway (Operational)
 - Railway (Discontinued)
 - Parcel Fabric
 - Rural Municipality
 - Community Pasture

- Project Infrastructure**
- Final Preferred Route

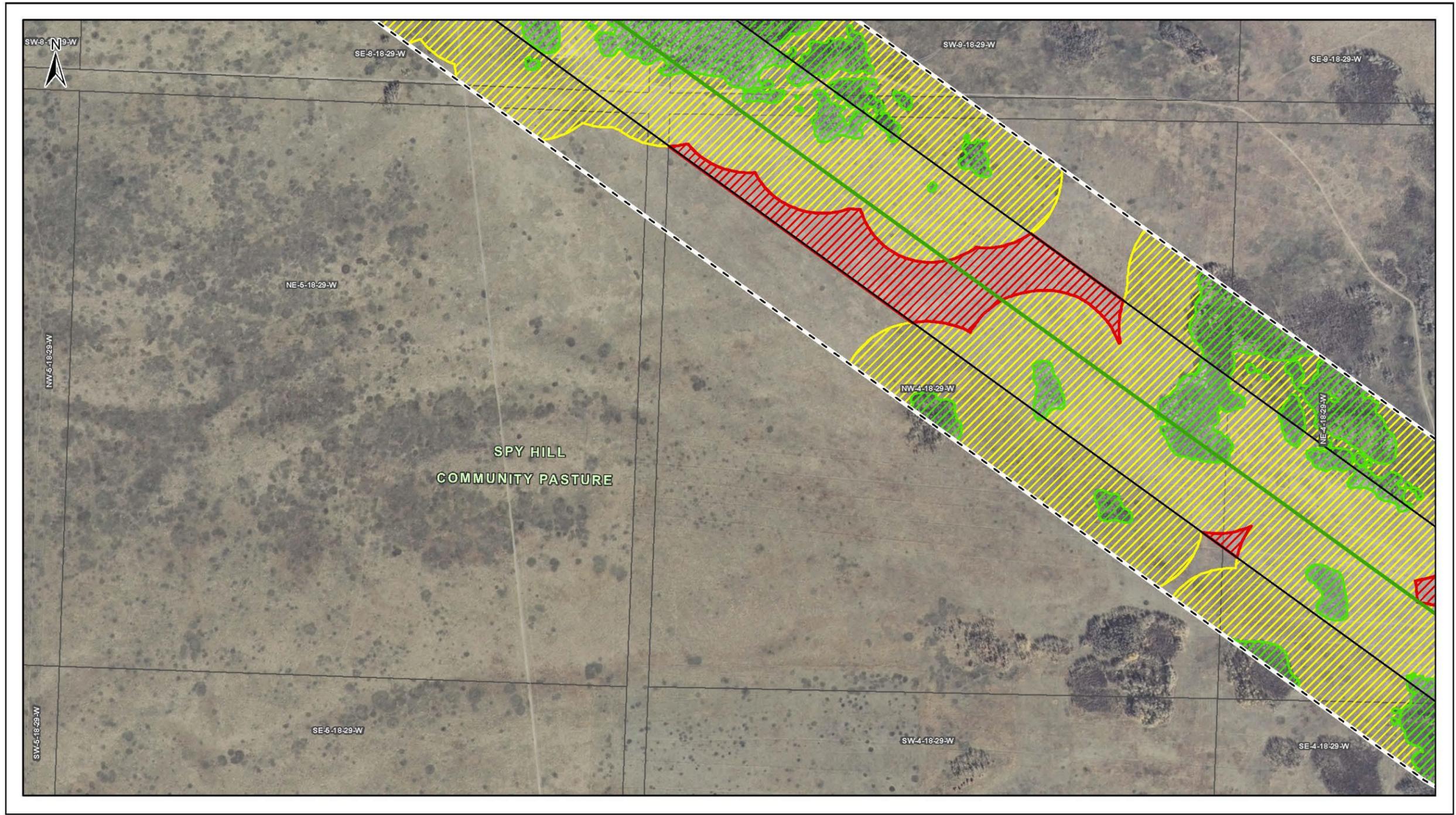
- Habitat Feature**
- Forested Area
 - Water
 - New Grassland Edge
 - Pre-Impact 100m Buffer

- Study Area**
- Final Preferred Route 100m Buffer in Spy Hill Community Pasture
 - Final Preferred Route 200m Buffer in Spy Hill Community Pasture

**Grassland Songbird Habitat Post Impact
 Spy Hill Community Pasture**

Draft: For Discussion Purposes Only

Map 1



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: April 28, 2020
 Version: Draft

0 62.5 125 250
 Metres
 1:5,000

Land Base

- Transmission Line
- Highway
- Major Road
- Local Road
- Railway (Operational)
- Railway (Discontinued)
- Parcel Fabric
- Rural Municipality
- Community Pasture

Project Infrastructure

- Final Preferred Route

Habitat Feature

- Forested Area
- Water
- New Grassland Edge
- Pre-Impact 100m Buffer

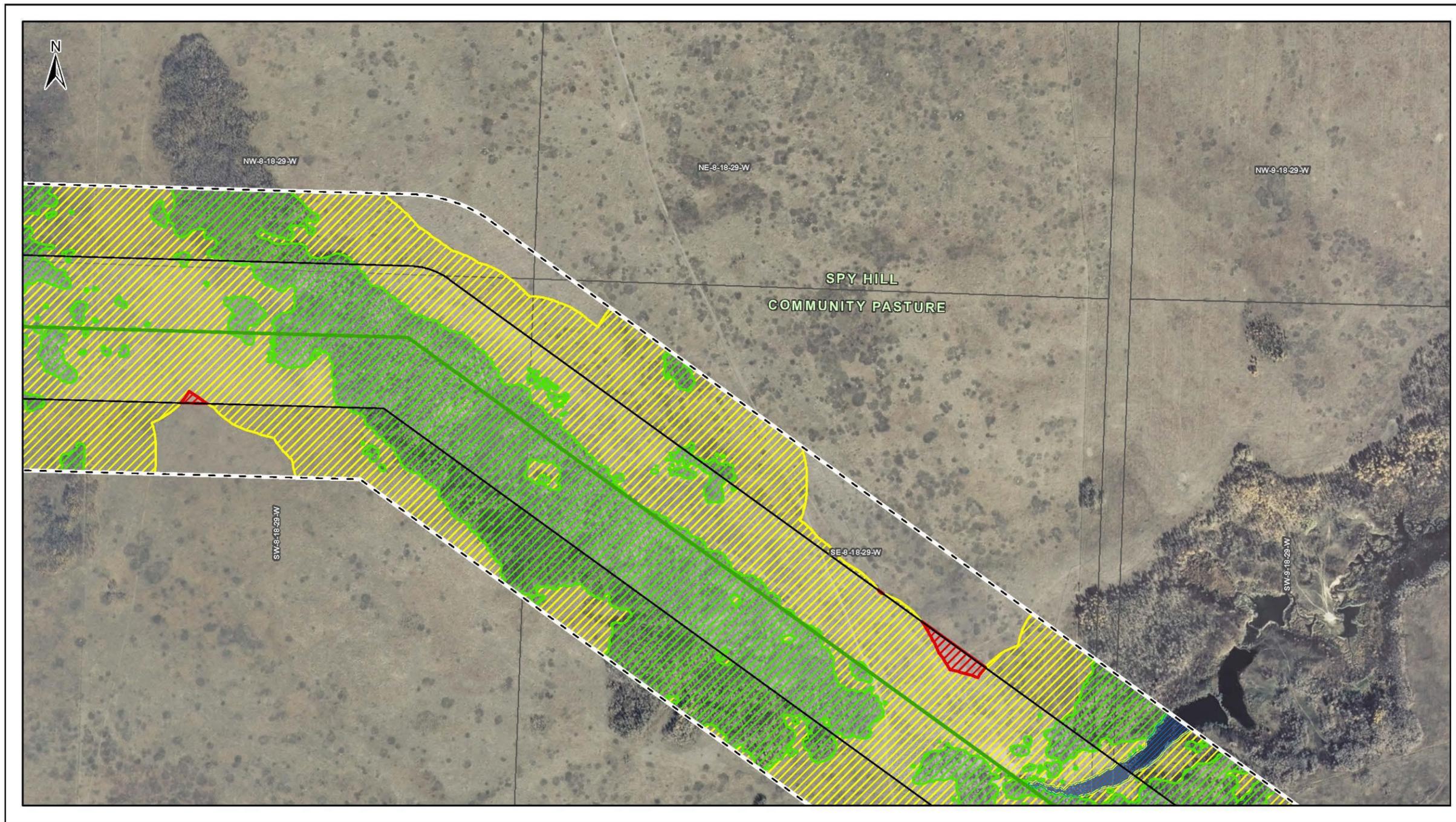
Study Area

- Final Preferred Route 100m Buffer in Spy Hill Community Pasture
- Final Preferred Route 200m Buffer in Spy Hill Community Pasture

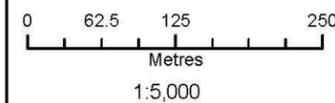
Grassland Songbird Habitat Post Impact Spy Hill Community Pasture

Draft: For Discussion Purposes Only

Map 2



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: April 28, 2020
 Version: Draft



- Land Base**
- Transmission Line
 - Highway
 - Major Road
 - Local Road
 - Railway (Operational)
 - Railway (Discontinued)
 - ▭ Parcel Fabric
 - ▭ Rural Municipality
 - ▭ Community Pasture

- Project Infrastructure**
- Final Preferred Route

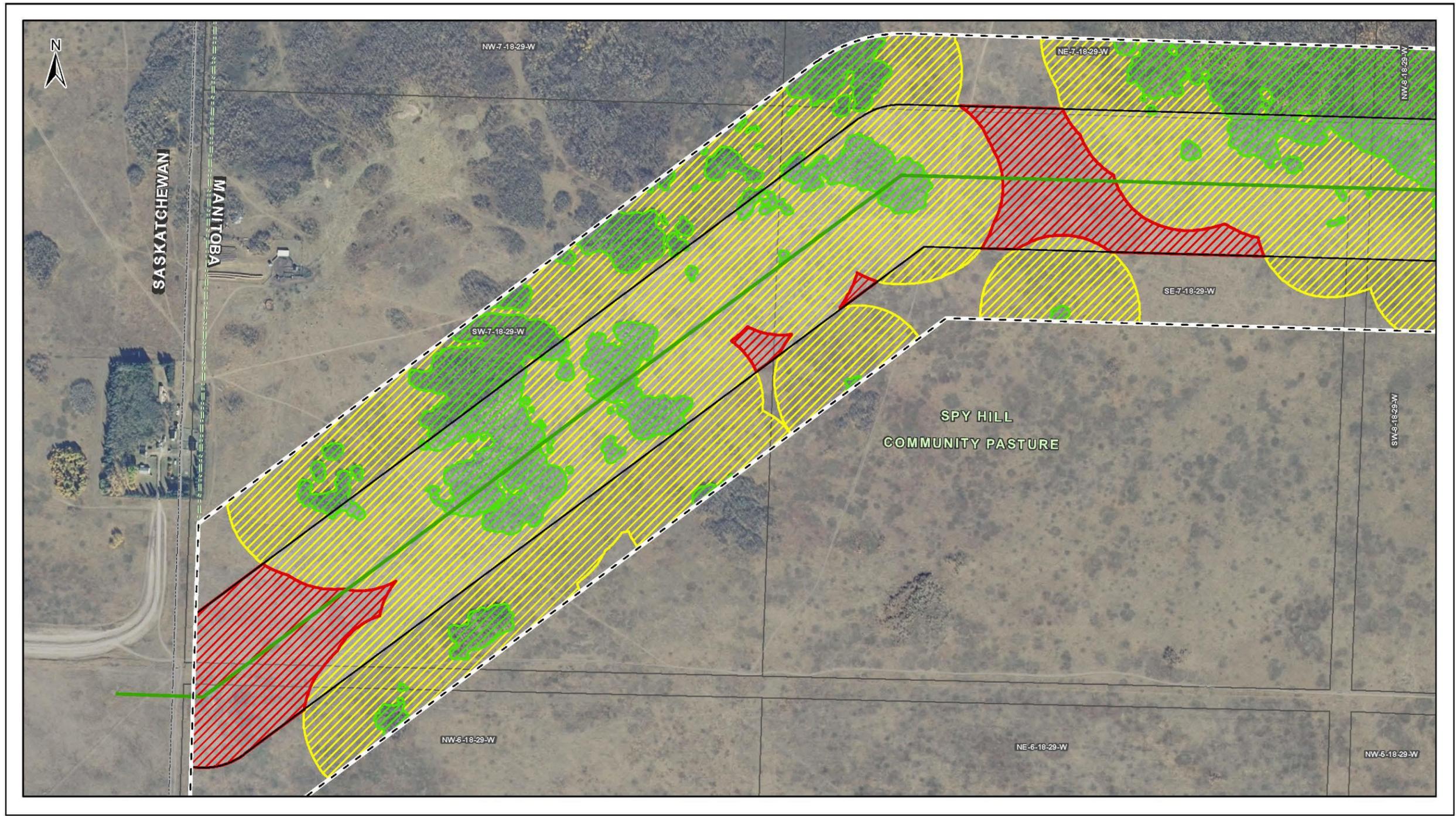
- Habitat Feature**
- ▨ Forested Area
 - ▨ Water
 - ▨ New Grassland Edge
 - ▨ Pre-Impact 100m Buffer

- Study Area**
- ▭ Final Preferred Route 100m Buffer in Spy Hill Community Pasture
 - ▭ Final Preferred Route 200m Buffer in Spy Hill Community Pasture

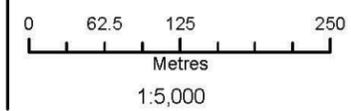
Grassland Songbird Habitat Post Impact Spy Hill Community Pasture

Draft: For Discussion Purposes Only

Map 3



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: April 28, 2020
 Version: Draft



- Land Base**
- Transmission Line
 - Highway
 - Major Road
 - Local Road
 - Railway (Operational)
 - Railway (Discontinued)
 - Parcel Fabric
 - Rural Municipality
 - Community Pasture

- Project Infrastructure**
- Final Preferred Route

- Habitat Feature**
- Forested Area
 - Water
 - New Grassland Edge
 - Pre-Impact 100m Buffer

- Study Area**
- Final Preferred Route 100m Buffer in Spy Hill Community Pasture
 - Final Preferred Route 200m Buffer in Spy Hill Community Pasture

Grassland Songbird Habitat Post Impact Spy Hill Community Pasture

Draft: For Discussion Purposes Only

Map 4

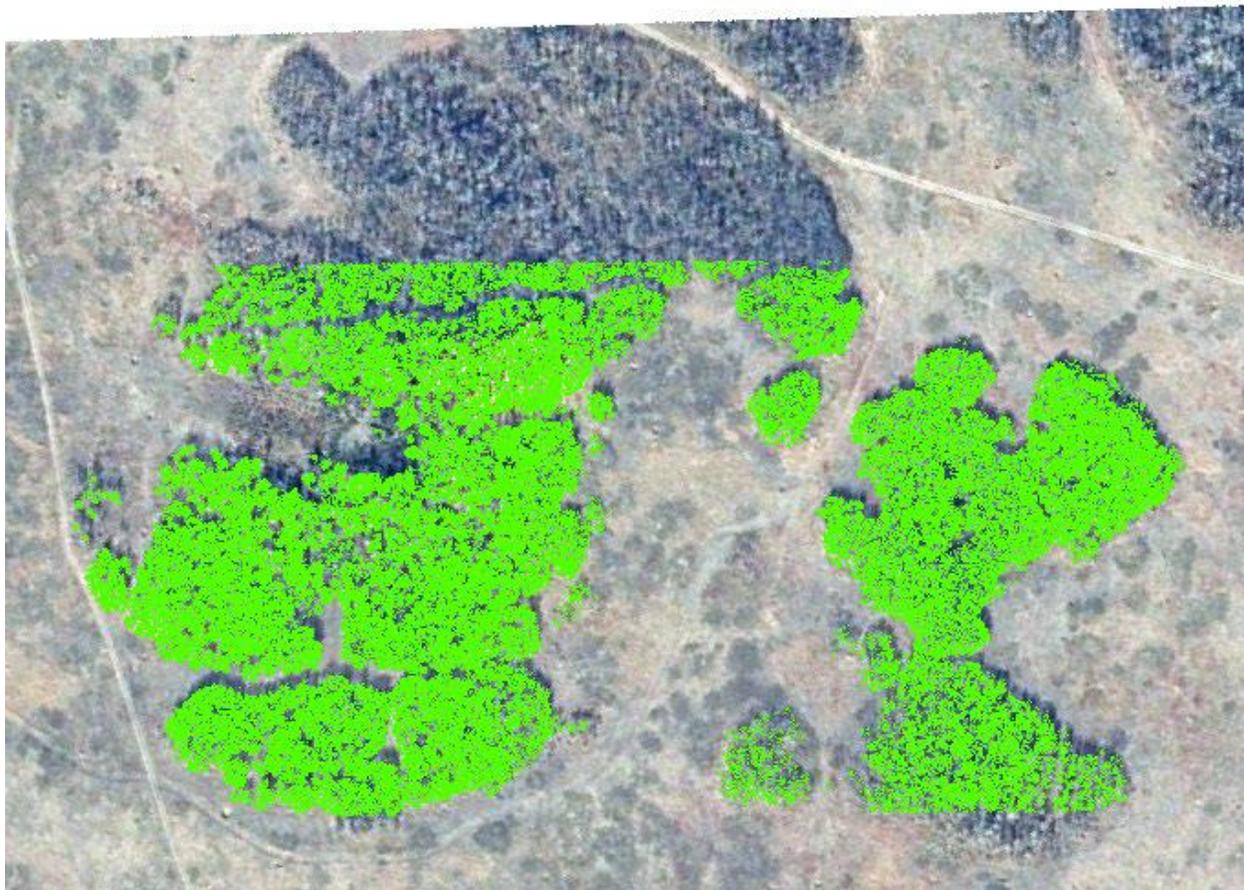
Appendix A. Calculation method for the Birtle Transmission Project post-impact 100m buffer analysis using precise forest classification

Analysis:

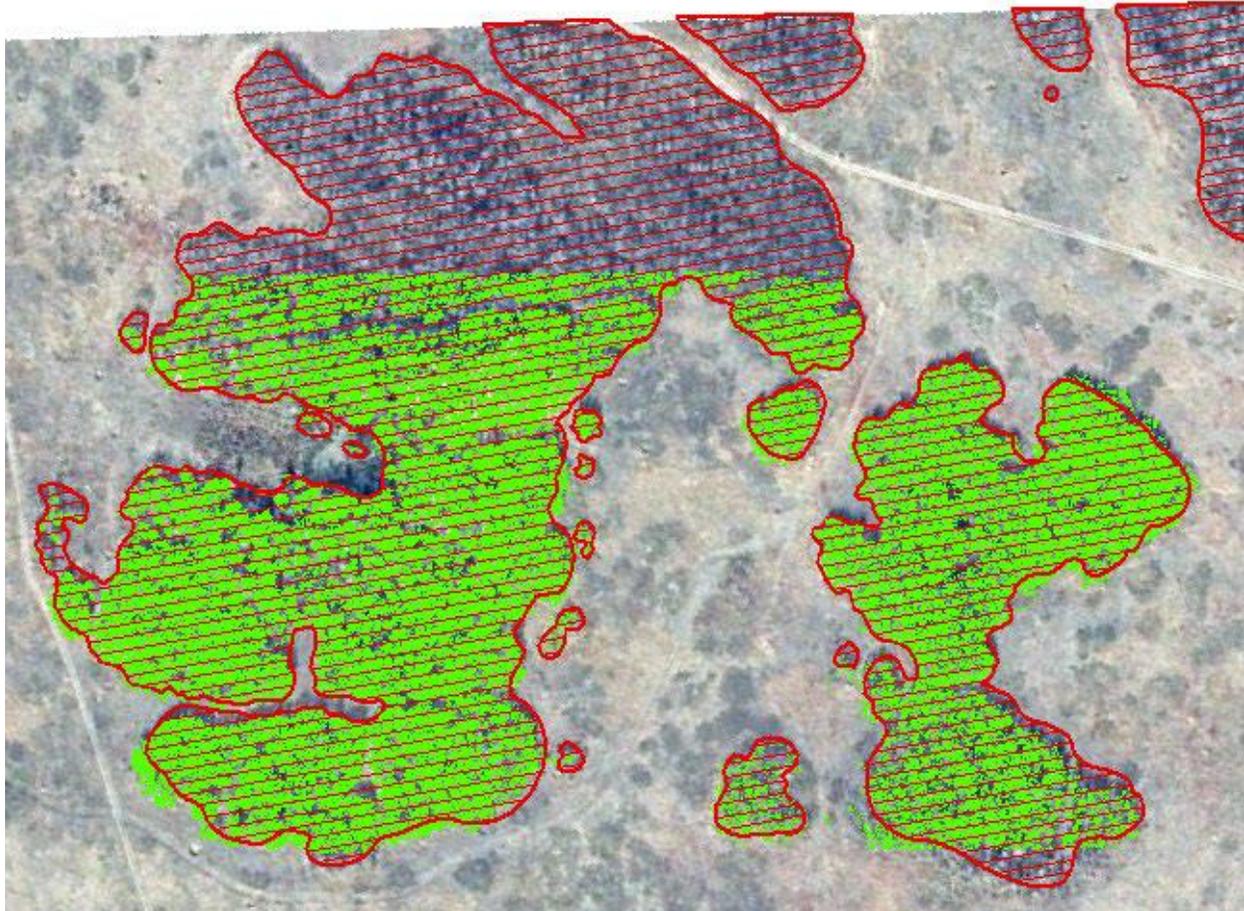
Step 1. Create precise forest classification

Within a 100-meter buffer of the Birtle Transmission Project final preferred route, LiDAR data was the main source to classify forested areas. Outside the 100-meter buffer, LiDAR was not available so freehand digitizing was performed using the OrthoRefresh imagery for reference.

The LiDAR point cloud provides classified points for medium and high vegetation. These medium and high vegetation points were filtered for Spy Hill Community Pasture, as shown below in green.



Using the medium and high vegetation classified points; forested areas were classified using the freehand digitizing tool. Within the extent of Spy Hill Community Pasture, digitizing was completed within a 200-meter buffer of the final preferred route and validated using the OrthoRefresh imagery.



Step 2. Create pre-impact 100-meter buffer

Grassland birds avoid the edge of forests due to high predation activity. Using the precise forest classification, forest edges were buffered a distance of 100 meters. This 100m pre-impact buffer along with forested areas becomes avoidance areas for grassland birds.

Step 3. Create post-impact 100-meter buffer

The construction of the Birtle transmission project will create a linear disturbance through suitable grassland bird habitat. However, if avoidance areas exist within the study area, these areas were already unsuitable habitat to begin with for grassland birds.

The Birtle Transmission Project final preferred route was buffered 100 meters. Forested areas and the 100-meter pre-impact buffer were removed (erased), as these were already unsuitable habitats for grassland birds. The remaining area is the post-construction impact buffer, as shown in red in the “Grassland bird habitat post impact” mapbook.

Results:

The results using the precise forest classification are summarized in the table below within a 100-meter buffer from the Birtle Transmission Project final preferred route. **13.6** hectares of grassland are within the post-impact 100-meter buffer.

Landuse/Disturbance Type	Hectares
Forest	42.1
Grassland Pre-Impact 100m Buffer	78.4
Grassland Post-Impact 100m Buffer (New Grassland Edge)	13.6
Water	0.2
Total	134.3

