Ghostpine Environmental Services Ltd.
10699 46 St SE,
Calgary, AB T2C 5C2
403-291-9238
www.ghostpine.com

Terrestrial Vegetation and Wildlife Assessment / Inspection Report: CN Rail Line

Prepared for:
Caitlin Cain, P.Eng.
Water Resources Engineer / Project Manager
Kerr Wood Leidal Associates Ltd.

December 23, 2020

Project No.: 5605

Ghostpine Rev.: 0

EFFECTIVE PLANNING, REAL SOLUTIONS

Limitation of Liability

Methods and results in this report are based on Ghostpine Environmental Services Ltd.'s (Ghostpine) adherence to municipal, provincial and federal regulations in place on the date issued. Inter and intra-regulatory agency interpretation of rules and regulations have been accounted for as much as reasonably possible.

During the preparation of this report and associated services, Ghostpine relied upon the full disclosure and accuracy of all applicable information by Kerr Wood Leidal Associates Ltd. (KWL), on behalf of the Drumheller Resiliency and Flood Mitigation (DRFM) Program, on the past, present and proposed conditions of this site. This report is based upon the information provided by KWL, on behalf of DRFM, information collected during desktop and/or field investigations, and information gathered from regulatory bodies and agencies. The information provided by parties other than Ghostpine is believed to be accurate but cannot be guaranteed. The work was conducted by Ghostpine in accordance with the scope of work prepared for this project, including verbal or written requests from by KWL, on behalf of DRFM. No other warranty, expressed or implied, is made.

All spatial data presented in this report (text or figures) was collected by a hand-held GPS unit, which typically has a 5 to 7 m margin of error. This known margin of error may be subject to further variance or discrepancy under certain field conditions or the time of day. A verified survey is recommended where any distances are required for regulatory compliance or conformance.

Ghostpine has exercised reasonable care and due diligence in the preparation of this report. The services have been performed in a manner consistent with other professionals currently practicing under similar conditions in the jurisdiction in which the services were provided.

It must be noted that the environmental assessment, as per the established scope of work of any site, is based on observations made at a specific moment in time; therefore, the conclusions and recommendations set out in this report are time sensitive. The report is based solely on the conditions that existed at the time of the investigation. The conclusions and recommendations set out in this report are based on the specific observations and testing at the subject site. Conditions across the site may vary which would affect the conclusions and recommendations made in the report. No detailed assessment on a given property or site can wholly eliminate the uncertainty regarding the potential for unrecognized conditions in connection with that particular property or site.

This report, and the assessments and recommendations described within, are intended for the sole use of KWL, on behalf of DRFM, and their agents. Other representations or warranties regarding surface, subsurface, biotic, abiotic, and documentation of said condition in the form of report, or regulatory submission not referenced, are not provided. Any unauthorized use of this report is at the sole risk of the user. The document may not be manipulated, edited or amended without the expressed written consent and understanding of Ghostpine.

KWL, on behalf of DRFM, may rely on this completed report for specific application to this project, based on project area discussed and conditions present at the time of the field assessment.

Table of Contents

Table

Appendices

1 INTRODUCTION

The Town of Drumheller (the Town) is planning on repurposing approximately 23 km of an abandoned Canadian National Railway (CN) Rail line and converting it to a pathway, as part of the Drumheller Resiliency and Flood Mitigation (DRFM) Program. Portions of the rail line may be used for flood mitigation infrastructure. The Town and DFRM are planning on entering into a 50-year lease agreement with CN for access to the right-of-way (ROW); the ROW will remain under ownership of CN. The regional location of the proposed project area is shown in Appendix A: Figure 1. The Drumheller area has a high diversity of wildlife and vegetation species, unique and sensitive habitats.

Kerr Wood Leidal Associates Ltd. on behalf of DRFM, contracted Ghostpine Environmental Services Ltd. (Ghostpine) to conduct a high-level terrestrial vegetation and wildlife assessment / inspection to be completed in advance of this upcoming program, so that potential issues may be identified and mitigated.

2 SCOPE OF WORK

Ghostpine's Scope of Work is as follows:

- A desktop assessment of government databases and other relevant sources;
- An on-site High-Level Wildlife Habitat and Vegetation Site Inspection - conducted to document any observable critical habitat areas, wildlife corridors, incidental terrestrial wildlife observations, potential wildlife and possible rare plant habitat or other areas of concern which could potentially be impacted by the proposed future works;
- DRFM had requested that occurrences of Black Knot, and any potential contamination sources (i.e. old buildings) be identified during the survey; and
- Preparation of a Wildlife Habitat and Vegetation Assessment / Inspection Report based on the results of the desktop assessment and field inspection data collected. Potential issues in relation to the proposed development are identified and evaluated. Mitigation recommendations as well as potential regulatory implications are provided.

As the assessment was conducted outside of the breeding and growing season, when detection / identification of species will be limited, this field visit is considered high-level and a reconnaissance of potential high-quality habitats.

As the project is in only a preliminary stage of planning, with no specific plans for temporary workspace and/or permanent developments, provided requirements during construction and recommended mitigation measures are high-level only, and may need to be adjusted once final plans are known.

A follow-up site inspection / surveys should be conducted between late May and July to assess wildlife, vegetation and wetland / waterbodies associated with the proposed project.

3 ASSESSMENT / SITE INSPECTION RESULTS

3.1 Protected Areas / Integrated Resource Plans

The proposed project is located within the Town of Drumheller surrounded by privately-owned and Crown-owned (public) land. The majority of the project area is located within the Red Deer River Corridor Integrated Management Plan (IMP; [GOA 2000a]; Appendix A: Figure 1). The IMP area includes both privately-owned land and public land and is a Best Management Practices planning document which has no regulatory requirements on privately-owned land. The IMP applies on all publicly owned land, and the policies are incorporated into regulatory approvals, if required.

Protection of wildlife and wildlife habitat is one of the major goals of the IMP. An overview of the wildlife resources within the project area and several strategies on maintaining and managing wildlife within this area are detailed within this plan.

The northwest portion of the project area also falls within Midland Provincial Park (Appendix A: Figure 1). The park was designated as a Provincial Park on June 5, 1979. The park is used for multiple recreational activities including wildlife and fossil viewing and hiking (Alberta Parks 2020). Although the project ROW is owned by CN Rail, and will be leased by the Town, further consultation with Alberta Environment and Parks (AEP) will be warranted to ensure all permitting and other agreements are in place, prior to project initiation. Alberta Parks may request or require more detailed wildlife / vegetation surveys and reporting within the park prior to project construction. A wildlife survey permit through AEP would be required for any targeted wildlife or rare plant surveys off the proposed ROW within the Park boundaries.

3.2 Surface Dispositions / Reservations Notations

A Public Land Standing Report was generated on October 20, 2020 to determine if there are any wildlife or vegetation related Protective or Consultative Notations and Grazing Leases which are traversed by the proposed project. Table 1 provides further details on the various Protective Notations (PNTs) traversed by the proposed project and these locations are shown in Appendix A: Figure 1.

Further consultation may be required prior to construction with respect to habitat protection within these dispositions.

Table 1 Selected Land Status along the Proposed Project

Disposition Type	Agency	Purpose	Location	Comments
PNT 743022	Red Deer Office – Rangeland District – Lands Division Dept. of Sustainable Resources Dev.	Fragile Slope Hazard	NE 20-29-10-15 W4M NW 20-29-10-16 W4M	Steep Banks of Red Deer River.
PNT 990079	Red Deer Office – Rangeland District – Lands Division Dept. of Sustainable Resources Dev.	Watercourse Protection	NE 20-29-01 W4M SW 20-29-09 W4M NW 20-29-01 W4M NE 20-29-01 W4M	No Comments.
PNT 731905	Red Deer Office – Land Use Area – Lands Division	River Recreational Site Potential	6-9-29-20 W4M	Red Deer River.
Disposition Reservation (DRS) 040045	Department of Environment and Water	Drainage Structure Project	SE 9-29-20 W4M	No Surface Disposition; Replacement of the existing ditch and outfall by a new outfall structure; the proposed works will decrease erosion potential and improve safety and aesthetics in the adjacent parks and pathways.
DRS 970001	Department of Environment and Water	Flood or Erosional Control Structure or Project	SE 9-29-20 W4M	No comments
DRS 860264	Department of Environment and Water	Flood or Erosional Control Structure or Project	NW 10-29-20 W4M	No comments
PNT 700436	Red Deer Office – Rangeland District – Lands Division Dept. of Sustainable Resources Dev.	Watercourse Protection	SE 20-29-11-W4M	Revested: Arda Red Deer River.
Grazing Lease (GRL) 32326	Grant Robert Dekeyser PO Box 2641 Drumheller	Within 100 m of Waterbody	SE 19-028-32 W4M	That which lies to the north of the left bank of the Red Deer River and excludes 1.53 acres for a railway ROW as shown on Plan RW334.
PNT 700238	Red Deer Office – Rangeland District – Lands Division Dept. of Sustainable Resources Dev.	Water Erosion Hazard	SE 19-28-21 W4M	Badland topography, sandy soil, Red Deer River.

Disposition Type	Agency	Purpose	Location	Comments
PNT 890034	Red Deer Office – Fish and Wildlife - Division Dept. of Sustainable Resources Dev	Ungulate Winter Range	SW 32-28-19 W4M	No Agricultural Disposition.
PNT 764959	Red Deer Office – Rangeland District – Lands Division Dept. of Sustainable Resources Dev.	Watercourse Protection	W4-19-028-29-SE	Rosebud River.

3.3 Wildlife Management Units

The proposed project traverses the Rosebud River Wildlife Management Unit ([WMU] 156), the Three Hills Wildlife Management Unit (WMU 158), and the Hand Hills Wildlife Management Unit (WMU 160). Tables 2 and 3 list the hunting seasons in these WMUs.

Table 2 Big Game Hunting Seasons in WMU 156, 158, and 160

Species		Hunting Season	
		Archery	General
White-tailed deer	Antlered	September 1 – November 3	November 4 – November 28 (Wed and Saturday only)
	Antlerless	September 1 – November 3	November 4 – November 28 (Wed and Saturday only)
Mule deer	Antlered and Antlerless **(WMU 158 and 160 only)**	September 1 – November 3	November 4 – November 28 (Wed and Saturday only)
Mule deer	Antlered **(WMU 156 only)**	September 1 – November 3	November 4 – November 28 (Wed and Saturday only)
Mule deer	Antlerless **(WMU 156 only)**	September 1 – November 3	November 4 – November 28 (Wed and Saturday only)
Moose	Antlered and Antlerless	September 1 – October 31	November 1 – November 30
Elk	Antlered	September 1 – October 31	September 17 – November 30
	Antlerless	September 1 – October 31	November 1 – January 20, 2021

Source: AEP (2020)

Table 3 Game Bird Hunting Seasons in WMU 156, 158, and 160

Species	Hunting Season
	General
Snow or Ross's Geese	September 1 – December 21 / May 15 – July 15
Canada or White-fronted Geese	September 8 – December 21
Ducks, Coots and Snipe	September 8 – December 21
Sandhill Crane	September 8 – December 21
Male Pheasant	October 15 – November 30
Ruffed Grouse	September 1 – January 15
Spruce Grouse	September 1 – January 15
Sharp-tailed Grouse	October 1 – October 31
Gray Partridge	September 1 – January 15

Source: AEP (2020)

3.4 Potential Spills and Contamination

During the initial project meeting, the DRFM had requested that any potential contamination sources (i.e. old buildings) be recorded during the field investigation, if observed. Incidental observations were recorded; however, this was not meant to be an exhaustive review of all potential contamination sources in the project area.

Three areas were recorded during the field investigation:

- An old concrete structure with an old barrel inside was found on the edge of the proposed ROW, near the west end of Rosebud in 8-29-28-19 W4M (Appendix A: Figure 3; Appendix B: Plate 1);
- A potential water well location was also noted along the ROW in 5-20-28-19 W4M shown in Appendix A: Figure 3; Appendix B: Plate 2); and
- An old pumphouse was found next to one of the bridges, adjacent to the ROW and the Rosebud River Corridor / Wayne (Appendix A: Figure 3: Appendix B: Plate 3).
- There may also be contamination from the railbed / rail line, but this is unknown.

Additionally, the ABADATA database was reviewed (Abacus Datagraphics 2020) for previously recorded Spills and Complaints within the project footprint. These potential nearby spill locations are shown in Appendix A: Figure 1 and are summarized in Table 4. An in-depth review of contamination reports or Phase 1 / Phase 2 assessments are not within the scope of this report; further review / assessments would be required for such assessments.

Table 4 Spills and Complaints Traversed by the project ROW.

Known or Suspected Contamination	Traversed Quarter-Section	Spill Date	Company	Incident#
Tank Farm / Oil Terminals	NW 29-28-19 W4M	September 29, 2002	Terroco Industries Ltd.	20022244
Unknown	SW 11-29-20 W4M	February 14, 1986	Samedan Oil of Canada, Inc.	19860252
Unknown	SE 11-29-20 W4M	February 21, 1983	Unknown Operator	19830180

3.5 Wildlife Habitat and Vegetation

A high-level desktop assessment was performed by Ghostpine to describe the current existing environment, vegetation and wildlife in the project area and to identify issues relating to the rail repurpose. An on-site Wildlife Habitat and Vegetation Inspection concerning vegetation, wildlife, wetlands, watercourses and drainages was conducted from October 27 to 29, 2020 to supplement the information identified during the desktop assessment. The field inspection was conducted by two biologists, working on foot, along the 30 m ROW. As land access was provided along the ROW only, adjacent areas were scanned visually from within the ROW. The desktop review summary is provided along with the field results in each of the following sections.

On October 27 the weather conductions at the time of survey are as follows: sunny (10 to 17 °C), with scattered clouds and a slight breeze to 34 km/h by the late afternoon; October 28, was sunny and cool (3 to 10 °C), with scattered clouds and a slight breeze, and October 29, the conditions were sunny and cool (3 to 6°C), overcast and no wind. There was no snow cover at the time of survey.

The railroad has been decommissioned along the entire ROW. The tracks and ties have been removed and only the coarse gravel railroad bed remains (Appendix B: Plate 4).

3.5.1 Vegetation

Desktop Assessment

The proposed project falls within the Northern Fescue Subregion of the Grassland Natural Region (Appendix A: Figure 1). The Northern Fescue Subregion is characterized by hummocky to rolling hill systems, though the central portion of the subregion is gently undulating. Small lakes contain much of the surface water and the Red Deer River is the only major river found in this subregion. Soils are predominantly Dark Brown Chernozems, while Brown Solonetzic soils are common through the centre of the area (Natural Regions Committee 2006). The Canadian Climate Normals for 1971 to 2000 measured at the Coronation weather station show an average yearly temperature of 2.3°C, an average temperature between the months of May and September of 13.5°C and an average yearly precipitation of 401 mm (Environment Canada 2007).

Grassland communities are composed of plains rough fescue, Junegrass, western porcupine grass, slender wheatgrass and Hooker's oatgrass. Typical forb species include prairie crocus, prairie sage, wild blue flax, northern bedstraw and three-flowered avens. Moist soils support shrub communities, while trees (poplar species) are confined to river valleys (Natural Regions Committee 2006).

Fescue Grassland areas which have been identified by AEP are shown in Appendix A: Figure 2. None are traversed by the project area.

On-Site Assessment

Midland Provincial Park (North End of the ROW to Highway 883)

The project area within Midland Provincial Park consists of native prairie and adjacent moderate steep sedimentary slopes, prone to erosion and hoodoo formation. Outwash from the adjacent slopes covers much of the ROW that is adjacent to the area (Appendix B: Plate 5). Dominant vegetation observed included silver sagebrush and northern wheatgrass; other species observed are as follows; sedge sp., tufted hair grass, sandbar willows, several large patches of thorny buffaloberry, Baltic rush, juniper and red-osier dogwood. Habitat surrounding the watercourse includes chokecherry, willows and Manitoba maple (Appendix B: Plate 6).

Red Deer River Riparian area (From Highway 838 to west end of Newcastle Trail)

Habitat consists of the Red Deer River, and the surrounding riparian area. Vegetation includes dense chokecherry, willows and Manitoba maples. Mature plains cottonwoods are found outside of the ROW.

The Red Deer River is traversed by the railway ROW. A large train bridge spans the river at this location (Appendix B: Plate 7).

Town of Drumheller (From west end of Newcastle Trail to 19 St. SE)

Surrounding land use consists of a combination of commercial, industrial and residential land uses. Vegetation along the ROW in Drumheller include cottonwood, Manitoba maple, red osier dogwood, prairie sage, smooth brome, prickly rose and chokecherry.

The riparian areas of the watercourses traversed in these areas include cottonwood, willows, smooth brome, grasses, sweet clover and western snowberry. Thorny buffaloberry was also observed in the areas near the edges of the riparian areas.

Acreages (19th St. SE to Riverview Road)

Within this area, land use is bound by Highway 56 on the south / southwest side, and acreages on the north / northeast side. Vegetation is similar to the Midland Provincial Park, with the exception of higher plant density, and greater amount of disturbance (i.e., Highway 56 and the acreages).

Rosedale Area

Habitat consists of the riparian area surrounding the Rosebud River (Appendix B: Plate 8), as well as residential/commercial and industrial buildings/use. Vegetation along the Rosebud River is similar to the Red Deer River riparian area.

Rosedale to Wayne

The surrounding habitat is comparable to that of the Red Deer River riparian habitat mixed with acreages. Thorny buffaloberry was also associated with the riparian area. The ROW is also bound by Highway 10X, and the Rosebud River meanders across the ROW in several locations.

3.5.2 Weeds / Invasive Species / Black Knot

Desktop Assessment

Weeds and introduced invasive species traversed and adjacent to the proposed ROW were recorded during surveys to provide baseline information on weed species prior to construction and to provide mitigation recommendations. A weed is defined as a plant species listed under the Alberta *Weed Control Act* (GOA 2008).

Introduced plant species are defined as "a species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities" (United Nations Environmental Programme et al. 1992). Plants that are intentionally seeded in improved pasture are not included under this definition.

Black Knot, caused by the fungus *Apiosporina morbosa*, is a common disease of plants in the genus *Prunus* (plums and cherries). As the infection spreads rapidly; high levels may result in the eventual death of the plant. DRFM had requested that occurrences of Black Knot be identified during the field investigation.

On-Site Assessment

Weeds and invasive species which were identified along the ROW are summarized according to segments of the ROW in Table 5. Degree of infestation of weeds and introduced species on, and in the vicinity of, the proposed development was rated on a 13-point system (Alberta Sustainable Resource Development [ASRD] 2009).

Weed Infestations and Black Knot observations are also shown in Appendix A: Figure 3; Appendix B: Plate 9. Black Knot was observed frequently in most areas along the proposed project.

Table 5 Weeds and Invasive Species observed along the Proposed ROW

ROW Segment	Noxious	Introduced	Density Distribution
Entire Railroad Bed		Absinthe Wormwood	11
	Common Mullien		8
		Sweet Clover	11
Midlands Provincial Park		Absinthe Wormwood	11
		Sweet Clover	11
Red Deer River Riparian Area	Common Tansy		7
Drumheller		Crested Wheatgrass	5
	Common Baby's breath		4
		Kochia	4
	White Cockle		1
		Wild Oats	4
	Yellow Toadflax		5

ROW Segment	Noxious	Introduced	Density Distribution
Acreages along Highway 56	Common Mullien		5
		Crested Wheatgrass	5
		Kochia	4
	Perennial Sow-thistle		8

Notes:

1 = very sparse; 2 = a few sporadically occurring individual plants; 3 = a single patch; 4 = a single patch, plus a few sporadically occurring plants; 5 = several sporadically occurring plants; 6 = a single patch, plus several sporadically occurring plants 7 = a few patches; 8 = a few patches, plus several sporadically occurring plants; 9 = several well-spaced patches; 10 = continuous uniform occurrences of well-spaced plants; 11 = continuous occurrence of plants, with a few gaps in the distribution; 12 = continuous dense occurrence of plants, 13 = Continuous occurrence of plants within a distinct linear edge in the polygon.

3.5.3 Rare Plant / Rare Plant Habitat

Desktop Assessment

Rare plant species for Alberta include species listed on the current Alberta Conservation Information Management System (ACIMS) tracking or watch lists, species provincially regulated as 'Endangered', 'Threatened', or 'Special Concern' under the Alberta *Wildlife Act* (GOA 2000b), and those listed as 'Endangered', 'Threatened', or 'Special Concern' on Schedule 1 of Canada's *Species At Risk Act* ([SARA] Government of Canada [GC] 2002). Lists of rare species may change as new information becomes available or as the status of population changes (Alberta Native Plant Council 2012).

Most plants considered rare in Alberta include species with ACIMS ranks ranging from S1 to S3 where:

- S1 is a species with a low population and/or has 5 or fewer known provincial occurrences;
- S2 has low population and/or 6 to 20 known provincial occurrences; and
- S3 has 21 to 100 known provincial occurrences.

Regardless of rank, a species is not considered rare unless it is listed on ACIMS (2017) 'Tracking List' or 'Watch List'.

According to a review of available AEP Wildlife Sensitivity layers, the proposed project is not located within an AEP Sensitive and Endangered Plant Species Range (AEP 2016).

A list of rare vascular plant, and rare plant communities, which have the potential to occur within the project area is provided (Appendix C: Tables C-1 and C-2). The rare plants and rare plant communities which may potentially occur within the project area do not have protection under government legislation such as the Alberta *Wildlife Act* or the *Species at Risk Act* (GOA 2000b and GC 2002).

A search of the ACIMS (2017) database for records of element occurrences of rare plants was conducted and indicated previously recorded instances of rare plants within the lands traversed by or within 1 km of the proposed ROW. The locations are shown on Appendix A: Figure 2. Lichen species which have been previously reported in the project area include: *Mannia fragrans* (SU), *Lecidella carpathica* (lichen) (S1S2), *Cetraria Arenaria*(S1S2), and *Rhizoplaca subdiscrepan* (SU). Rare vascular plant species and rare plant communities which have been previously reported in the project area include: *Crataegus chrysocarpa* / *Heracleum maximum* - *Urtica dioica* - Viola canadensis shrubland (S1S2 Plant community), and Powell's saltbrush (*Atriplex powellii*). Appendix C: Tables C-1, C-2 and C-3 provides listings and rankings of these species.

Field Assessment

Rare vascular plants were not observed during the site inspection; however, the site inspection was conducted during the fall period when rare plants or communities are not evident.

The habitats with highest potential to support rare plants and rare plant communities which potentially may be found along the CN Rail ROW (Appendix C) are as follows: areas with sandy / gravelly grasslands and slopes, riparian shrublands / forests, eroded / depositional sites, and areas with ephemeral to seasonal flooding potential. Unusual habitat features along the CN line may also support rare plants such as exposed rocks and gravel, seepage sites, and older (stabilized) anthropogenically disturbed sites.

Based on desktop reviews and site inspection, surveys should focus on the following areas of the CN Rail ROW with the greatest potential for supporting rare plants and communities:

- All of Midland Provincial Park, with particular focus on creek crossings, shrubby areas, and ephemerally flooded areas with exposed soils;
- Riparian forest / shrubland habitats at the Red Deer River crossing site on the north side of Drumheller and along the ROW between Drumheller and Rosedale;
- Areas within the Rosebud River Valley south of Drumheller from Rosedale to south of Wayne, particularly areas that deviate away from the developed highway ROW; and
- Any other areas with wetland or drainage habitat along the route.

3.5.4 Wildlife

Desktop Assessment

Wildlife Species of concern and those which are of economic concern are the focus of this assessment. For the purpose of this report, wildlife species of concern are species which have an official federal and/or provincial listing or ranking as follows:

- Species legally listed (or approved for listing) as *Endangered* or *Threatened* under the Alberta *Wildlife Act* (GOA 2000b);
- Species designated in Alberta as *Endangered*, *Threatened* or *Special Concern* by the Committee on the Status of Endangered Wildlife in Canada ([COSEWIC] 2017);
- Species listed as *Endangered*, *Threatened*, or *Special Concern* under Schedules 1, 2, and 3 of the federal SARA (GC 2002);

- Species ranked as *Vulnerable*, *Imperiled* or *Critically Imperiled* by the Canadian Endangered Species Conservation Council (CESCC [2016]); and/or
- Species ranked *At Risk*, *May be At Risk* or *Sensitive* by the Alberta Wild Species General Status Listing – 2015 (AEP 2017).

Other species of management concern include:

- Unlisted species which do not have a specific ranking or listing as above; however, may still have protection under government legislation (e.g., unlisted migratory bird species are protected under the federal *Migratory Birds Convention Act* [MBCA {GC 1994}] and unlisted raptor species are protected under the Alberta *Wildlife Act* [GOA 2000b]); and
- species of economic concern (i.e., ungulate and waterfowl, waterbird and upland game species which are hunted).

A review of available AEP Wildlife Sensitivity Ranges (AEP 2016) determined the project area is located within the following ranges: Burrowing Owl, Sharp-tailed Grouse, Sensitive Raptor: golden eagle, prairie falcon, ferruginous hawk, and Other Sensitive and Endangered Species: Grassland (Appendix A: Figure 2).

A list of wildlife species of concern which potentially may occur within the project area based upon range and habitat in the project area is provided (Appendix C). Additionally, wildlife species which are hunted within the project area include: white-tailed deer, mule deer, elk, snow goose, Ross's goose, waterfowl, sandhill crane, pheasant, grouse species and gray partridge (refer to Section 3.3 for hunting seasons).

A search of the AEP Fish and Wildlife Management Information System (FWMIS) online mapping tool indicated that the following species have been previously recorded within 1 km of the project area: Bald eagle, burrowing owl, bull snake, Canadian toad, eastern kingbird, ferruginous hawk, least flycatcher, northern goshawk, northern leopard frog, prairie falcon, prairie rattlesnake, short-eared owl, swift fox western small-footed bat, and western wood-pewee (Note: the project is not in the range of the prairie rattlesnake and swift fox; these observations are rare for this area). Detailed FWMIS results were also requested from the AEP area wildlife biologist to determine previously recorded observations in the project area. The results of selected locations are shown on Appendix A: Figure 3 by quarter-section only. Due to data-sharing agreements with AEP, site specific data could not be provided within this report.

Records of butterfly species shasta blue (*Plebejus shasta*) (S3), woodland skipper (*Ochlodes sylvanoides*) (S2) and Acadian Hairstreak *Satyrium acadica* (S3) are also shown on Appendix A: Figure 3. These species have no current protection under government legislation.

Aerial imagery which had been provided by the DRFM was reviewed by the field biologists prior to the survey to identify potential ungulate / game trails prior to the survey as well as other potential wildlife habitats. These potential features were marked and downloaded onto GPS to check during the site investigations.

Field Assessment

The site investigation focused on recording potential habitats of species of concern as well as site-specific wildlife features (e.g., dens, nests, breeding areas and mineral licks, etc., ungulate trails). All vertebrate wildlife heard and observed during the survey were recorded.

A juvenile bald eagle (Apparently Secure[1], Not at Risk[2,] N/A[3], S4b, S5M Watched[4], *Sensitive*[5]) was observed flying in over the project area in NW 29-28-19 W4M. The bald eagle is protected under the Alberta *Wildlife Act* (GOA 2000b).

Unlisted wildlife species observed during the survey include:

American robin, black-capped chickadee, black-billed magpie, blue jay, brown-headed cowbird, Canada goose, common raven, downy woodpecker, least chipmunk, mule deer, northern flicker, ring-necked pheasant. All wildlife species observations will be entered onto FMWIS load-forms and submitted to AEP as part of a data-sharing agreement.

Wildlife Features:

Site-specific wildlife features observed during the site investigation are shown in Appendix A: Figure 3, and are summarized as follows:

- a potential den site with some excavation at entrance was observed ~ 70 m west of the ROW in SW 16-29-20 W4M within Midland Provincial Park (Appendix B: Plate 10);
- twenty-two nests of small sized and nine of medium sized diameter (Appendix B: Plate 11);
- one tree cavity which may support a cavity nest;
- Seven nest boxes adjacent to the proposed ROW on fence posts in NW 31-28-19 W4M, SE 31-28-19 W4M and SE 18-28-19 W4M (Appendix B: Plate 12);
- Twenty-two ungulate/game trails were noted to cross the ROW (Appendix B: Plate 13). The existing ROW also acts as a wildlife corridor with signs of deer, rabbit and coyote along the ROW; and
- One mineral lick along the ROW in 4-32-28-19 W4M (Appendix B: Plate 14).

Areas along the ROW with greater potential for wildlife use / species of concern are as follows:

- The Midland Provincial Pak and Rosebud River / Wayne areas along the ROW provide the highest potential habitat for species of concern. The surrounding steep slopes provide raptor nesting and snake habitat; the thorny buffaloberry and riparian shrub / tree cover provides habitat for songbird species of concern such as the loggerhead shrike, least flycatcher, eastern kingbird and common yellowthroat.
- The bridges which traverse the Red Deer River and the Rosebud River may also provide swallow nesting habitat; and
- Although few wetland habitats were found along the ROW, there is potential for amphibians in the seasonal marsh found along the ROW (refer to Section 3.5.5).

[1] CESCC (2016)
[2] COSEWIC (2017)
[3] GC (2002)
[4] GOA (2000b)
[5] AEP (2017)

3.5.5 Wetlands

Desktop Assessment

A background review of the Alberta Merged Wetland Inventory, aerial imagery, Google Earth imagery, topographic maps and LiDAR was conducted along the ROW to identify potential wetlands.

Background information was reviewed to determine if springs have previously been recorded in the project area. According to the desktop review, springs have not been previously identified (Borneuf 1983).

Field surveys were conducted to identify wetlands which are traversed or adjacent to the ROW. All identified wetlands were classified according to the *Alberta Wetland Classification System* (Alberta Environment Sustainable Resource Development 2015). During field work, the start and end coordinates of wetland areas traversed were determined using vegetation information. Wetland characteristics (size, presence of water, dominant vegetation), were recorded with photographs taken of each feature.

Field Assessment

Two wetlands, a seasonal marsh and shrubby swamp, were identified along the ROW, adjacent to the railbed (Appendix A: Figure 3; Appendix B: Plates 15 and 16).

The seasonal marsh is traversed by the project ROW and is located within SE 29-28-19 W4M. Vegetation observed in the seasonal marsh includes sedge sp., western dock, Canada thistle and with scattered willow and trembling aspen along the bank.

The shrubby swamp is traversed by the project ROW and falls within SE 18-28-19 W4M. Vegetation observed within the shrubby swamp includes willow sp., red osier dogwood, clematis and western snowberry.

3.5.6 Watercourses / Ephemeral Drainages

Desktop Assessment

The northern portion of the ROW is located within the Red Deer River above Rosebud River Hydrologic Unit ([HUC] 8 watershed and the southern third of the project traverses the Rosebud River HUC 8 watershed (Appendix A: Figure 2).

As per the Alberta Whirling Disease Decontamination Risk Zone Map (AEP 2020b), the ROW is located within an area designated as White Zone for Whirling Disease (i.e., White Zone means reduced risk of introductions: zone that does not have whirling disease susceptible species; Appendix A: Figure 2). Construction activities are required to follow Appendix D: Decontamination Instructions for Industrial and Construction Operations of AEP's Decontamination Protocol for Work in or Near Water (AEP 2020c).

Field Assessment

Watercourses, ephemeral drainages, and ditches identified along the ROW are shown in Appendix A: Figure 3. Bridge or bridge / culvert crossings have been previously built as part of the railroad construction over each of the watercourse crossing locations. Riparian vegetation which surrounds the watercourses generally includes: chokecherry, red-osier dogwood, willow, buckbrush, sedge (sp.), tufted hairgrass, thorny buffaloberry and sandbar willow.

Large and small permanent as well as intermittent watercourses maintain a defined channel (i.e., bed and banks); thus, meet the provincial definition of a water body (GOA 2013b). The provincial stream classifications and accompanying instream Restricted Activity Periods (RAPs) for watercourses crossed by the project were determined according to the Code of Practice (COP) Management Area Map for Brooks (GOA 2006). The project traverses 3 large permanent watercourses, 17 small permanent watercourses, and 1 intermittent watercourse (Appendix A: Figure 3). All the watercourses traversed have a Class C designation (mapped or unmapped) and all have a RAP of April 16 to June 30, except _20201027_021, JP_20201029_058, and JP_20201028_051 (Appendix A: Figure 3), which have a RAP from April 16 to July 15.

Ephemeral drainages are distinguished from watercourses by the lack of a defined channel (i.e., bed and banks) and are often associated with wetlands. They are frequently completely vegetated and periodically dry. Four ephemeral drainages (Appendix A: Figure 3) were identified along the ROW. A sensitivity rating (i.e. watercourse Class and RAP) is not assigned to these ephemeral drainages as they do not meet the provincial definition of a water body (GOA 2013b). Fish presence is unlikely within ephemeral drainages.

Three ditches are also traversed (Appendix A: Figure 3). Ditch banks along the Acreages near Highway 56 are surrounded by willow sp., chokecherry, sedge sp., western snowberry, prickly rose and red osier dogwood.

Site photographs documenting the watercourse types included:

- Large permanent watercourse (Appendix B: Plates 7 and 8);
- Small permanent watercourse (Appendix B: Plate 17);
- Intermittent watercourse (Appendix B: Plate 18);
- Ephemeral drainage (Appendix B: Plate19); and
- Ditch (Appendix B: Plate 20).

4 REGULATORY REQUIREMENTS

Table 6 provides a listing of regulations related to wildlife, wildlife habitat and vegetation which may apply to the project, depending on construction detail and project design. Other categories such as Historical Resources are not within the scope of this project. Mitigation measures which would show due diligence in following these Acts and Regulations are further discussed in Table 6.

Table 6 Wildlife, Habitat and Vegetation Related Regulations Potentially Applicable to the Proposed Project

Category	Regulations
Vegetation	• Seeds used for site restoration must meet specifications set out in the ***Canada Seed Act*** (GC 1985a) Weeds and invasive species are regulated under the ***Weed Control Act*** (GOA 2008). The ***Weed Control Act*** prescribes activities that must be undertaken should a noxious or prohibited weed be encountered. • Alternative weed control methods using herbicides or pesticides should comply with the ***Environmental Code of Practice for Pesticides*** (GOA. 2010b).
Wildlife	• The federal **MBCA** (GC 1994) provides protection of migratory birds, their nests, and their eggs. • The federal **SARA** governs activities that have potential to impact any federally listed species (GC 2002). This legislation mostly applies to projects on federal lands, but also applies to Schedule 1 Species which are protected under the MBCA and all Schedule 1 aquatic species on all lands regardless of ownership or jurisdiction (GC 2002). Permits are not issued for "Incidental Take" of species and their active features under either of these Acts or their associated regulations (Environment Canada 2014 and 2018). • The provincial ***Wildlife Act*** requires protection of wildlife species which are listed under this act (GOA 2000b).
Fisheries	• Bridge crossings require a Notification under the COP *for Watercourse Crossings* which is enacted under the provincial ***Water Act*** (GOA 2000c) and the ***Water (Ministerial) Regulation***. A notification must be submitted at least 14 days prior to any instream work commencing (GOA 2013b). • If any work is required within the small and large permanent watercourses to upgrade or replace bridges, which could temporarily limit the publics' ability to navigate through the site, an application to Transport Canada (TC) would be required as per the ***Canadian Navigable Waters Act*** (CNWA [GC 2019]). If an existing CNWA approval exists, then an amendment would be required. • Under the provisions of the ***Fisheries Act*** (GC 1985b), no work may be carried out that will result in the "death of fish" or the "harmful alteration, disruption or destruction of fish habitat" unless authorized by Fisheries and Oceans Canada (DFO). The DFO's "Project's near water" website (DFO 2020a) is utilized by proponents to determine if the project is in compliance with the ***Fisheries Act***. In the event that all "measures to protect fish and fish habitat" cannot be adhered to, a DFO Request-for-Review may be required. As part of the DFO Request-for-Review, a field-based Fish and Fish Habitat Assessment may be required. A review may take up to 90 days for DFO to complete. • For dewatering activities (if isolation crossing methods are used), follow appropriate procedures provided in ***Fresh Water Intake End-of-Pipe Fish Screen Guideline*** for screening on water diversion hoses (DFO 1995). As per the ***Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater*** (DFO 2020b), a Notification is required to be submitted ten working days before starting instream work.

Category	Regulations
	• For temporary isolations, follow appropriate procedures provided in DFO's ***Interim Code of Practice: Temporary Cofferdams and Diversion Channels.*** A Notification is required to be submitted 10 working days before starting instream work (DFO 2020c). • All equipment must be cleaned, drained and dried as per AEP's Appendix D: Decontamination Instructions for Industrial and Construction Operations of AEP's **Decontamination Protocol for Work in or Near Water** (AEP 2020b).
Hydrology and Water Quality	• A Code of Practice Notification to AEP is required for all crossing structures where repair, replacement, maintenance or decommissioning occur and must be submitted a minimum of 14 days prior to construction (GOA 2013b). • Construction activities that could affect water quality of a watercourse must ensure the water quality meet the federal **Canadian Council of Ministers of the Environment's (CCME) Water Quality Guidelines for the Protection of Aquatic Life – Freshwater** (CCME 2020). • All equipment must be cleaned, drained and dried as per AEP's Decontamination Instructions for Industrial and Construction Operations of AEP's ***Decontamination Protocol for Work in or Near Water*** (AEP 2020c).
Wetlands	• If any activity is planned within a wetland, a ***Water Act*** Approval via a Code of Practice Notification (GOA 2013b), Wetland Assessment and Impact Form (WAIF) (GOA 2018) or Wetland Assessment and Impact Report (WAIR) (GOA 2017) may be required prior to construction, depending on the type of activity planned. Lower impact activities may be eligible for a lesser degree of assessment while activities which have a more permanent impact require a high degree of assessment and reporting.

Municipal and Provincial Permits / Approvals

Municipal

Municipal permits and approvals (e.g. landowner agreements, crossing agreements, proximity agreements, development permits, stripping and grading permits, etc.) may be required. Consultation with a land agent is recommended to ensure that all applicable permits / approvals are in place prior to construction start.

Provincial

Consultation with the AEP, with respect to any access to Midland Provincial Park and other Crown land is warranted, especially if temporary workspace is required on any adjacent Crown land. Any activity that extends beyond the boundary of a government road allowance onto public lands (including the bed and shore of a watercourse, or a crown claimed waterbody or other Crown land), requires an authorization under the *Public Lands Act* (GOA 2000) for access to these lands.

A Temporary Field Authorization can be used to receive temporary access to Crown lands for activities such as on-site traffic diversions or for work within the bed and banks of the watercourse. If the Crown land is currently occupied under an existing disposition, consent to occupy this land is required from the current disposition holder.

4.1.1 Potential Project Effects and Mitigation Measures

The potential effects of project construction and operations on wildlife, wildlife habitat vegetation, and waterbodies are summarized in Table 7. Mitigation alternatives and considerations are provided. As the project design is in its preliminary planning stage, mitigation measures and regulatory requirements will need to be reviewed once project design is complete.

Table 7 Potential Project Effects and Mitigation Measures for Wildlife, Wildlife Habitat and Vegetation Issues

Resource Component	Potential Effect	Recommended Mitigation Measures
Vegetation	• Construction of the pathway and ongoing use could lead to the further spread and introduction of weeds introduced species and black knot. This could potentially lead to a reduction in species diversity within the project area. • Construction of the pathway and ongoing use could potentially cause disturbance to rare plants and rare plant communities along the ROW through direct impacts and via further weed invasion, increase in dust etc.	• Weeds should be managed as required during construction to comply with the Alberta *Weed Control Act* and *Weed Control Regulations* (GOA 2008 and 2010a). • Control of *Noxious* and eradication of *Prohibited Noxious* weed patches should be undertaken prior to construction activities to reduce the likelihood that weeds will be spread along the pathway; Herbicides cannot be used in ephemeral drainages and watercourses, and movement of herbicides into nearby drainages, watercourses, and ditches or other sensitive areas (i.e., rare plants, native prairie) needs to be avoided. Alternative weed control methods (hand pulling, cutting, steaming) should be considered in those areas in order to comply with the *Environmental Code of Practice for Pesticides* (GOA 2010b). • Mulch depths of 7.5 cm or greater have been shown to reduce and control weeds in a landscape setting (Olive et al. 2009; Rakow and Greenly 1995). Mulch type has also been effective at mitigating the spread of weeds (Percival et al. 2008; Rakow and Greenly 1995). • The integrated use of mulch and ungulate grazers, such as goats, has been effective for the control of weeds (Osoro et al. 2012; Kathiresan et al. 2011; Kirby et al. 1997).Goats have been shown to be less intrusive on the environment than cattle and more effective than sheep at targeting weeds as a food source (West et al. 1994). • Pruning is the only way to control Black Knot once the disease takes hold. Diseased wood must be removed and destroyed immediately (burned or buried) to prevent further spread as Black Knot can produce spores for up to four months after removal (GOA 2020). • All machinery to be used on site should be cleaned before arrival to ensure that weed seeds and other propagules (e.g., pieces of root) are not brought into the project area. • All materials, including fencing which is brought on site, should also be cleaned to ensure they are free of weeds. • All equipment that arrives in a soiled condition, or that has passed through areas that have been identified as having a weed problem, should not be allowed on the site until it has been cleaned off at a suitable location off site.

Resource Component	Potential Effect	Recommended Mitigation Measures
		• Work should be conducted during dry and/or frozen conditions to minimize effects (i.e., rutting etc. on vegetation). • Final reclamation of any disturbed areas should be completed to restore species and diversity, via natural recovery or seeding with a certified weed-free seed mix developed in consultation the landowner and with AEP (as applicable). • A rare plant survey during the growing season is recommended in the high-potential areas noted in Section 3.5.3. If rare plant species or communities are found, site-specific mitigation or avoidance measures will be recommended. • Rare plant surveys are floristic surveys best completed by botanists with a strong knowledge of the plants that occur in a specific region. They are completed by surveying high potential habitat areas, usually at a minimum of two seasons to account for different plant growth periods (e.g., spring versus summer flowering plants).
Wildlife	• Loss or reduction of habitat • Wildlife avoidance or blockage of habitats during construction • Increased risk of mortality (i.e., vehicle collisions; loss of bird species during the high-risk nesting period) • Disturbance to local species	• Targeted Wildlife surveys by qualified biologists according to the Alberta Sensitive Species Inventory Guidelines are recommended to identify the presence of species of concern and any site-specific habitats (i.e., nests, dens etc.) (GOA 2013a), Surveys may be mandatory if the work is on Crown land and a disposition is required (GOA 2018). Recommended surveys in high potential areas include: Prairie Raptor (Mid-May to June 30); Amphibian (May to August), Grassland Bird (mid-May to July) and Snake (April to mid-June or mid-August to October). • Clearing and construction activities should not occur between (March 15 to August 31) (Environment Canada 2018; ASRD 2011) to avoid the high-risk bird / wildlife nesting / breeding period to reduce potential impacts on local wildlife species. (Note: the general nesting period for migratory birds mid-April to late August; however certain raptor species may nest as early as March). Alternatively, if construction is scheduled to occur within this high-risk period, any vegetation in undisturbed areas that require clearing should be pre-cleared outside of this period, and a pre-construction wildlife sweep should be conducted prior to the onset of any activities. The wildlife sweeps should occur within seven days prior to construction in order to identify potential wildlife issues as close to the time of construction as possible. Nest sites and cavities which were found during the site investigation should be rechecked for activity prior to clearing. • If site-specific habitats (i.e., dens, nests, breeding areas) protected under government legislation are discovered, suspected or observed prior to and during construction / clean up, work should be postponed, and a qualified Wildlife Biologist should be contacted to recommend a species appropriate buffer zone in

Resource Component	Potential Effect	Recommended Mitigation Measures
		consideration of AEP recommended setbacks (ASRD 2011; GOA 2018) or Environment Canada Guidelines (Environment Canada 2019). • Nest boxes (species unknown; seven total) were observed on fence posts in NW 31-28-19 W4M, SE 31-28-19 W4M and SE 18-28-19 W4M, and adjacent to the proposed project ROW. If development is scheduled during the migratory bird nesting season, it is recommended to remove the nest boxes prior to construction, when they are not active, in order to discourage bird nesting at this location during construction. The nest box should be replaced after construction in consultation with the landowner and nest box monitor. • Twenty-two game trails were identified as traversing the ROW. In order to allow wildlife movement through the area, the trails should not be blocked by equipment/ fencing / infrastructure etc. during or after construction. • The placement of any temporary workspaces for construction should avoid identified sensitive habitats (i.e., a mineral lick, wetlands, ephemeral drainage, watercourses) to reduce direct disturbance of the habitat and allow wildlife usage. • The number of construction vehicles and their travel speed through the project area should be limited to minimize wildlife mortality. • ESC measures should be used on site during construction to prevent sediment / material movement off-site or siltation into the surrounding wildlife habitat. • Wildlife should not be harassed or fed. • Wildlife-proof garbage containers should be installed, with a daily removal of garbage and other wildlife attractants to site until project completion; containers should also be considered for ongoing use. • Ungulate and game bird hunting are recreational activities within the project area which have some potential to conflict with pathway usage. It is recommended that pathway users are informed of the various hunting seasons in the vicinity of the project. • If snake hibernacula are found, it is recommended signage be installed in the area prior to construction and during pathway usage to watch for and avoid snakes on the ROW; • Signage could also be used for educational opportunities regarding the flora and fauna which exists along the ROW.

Resource Component	Potential Effect	Recommended Mitigation Measures
Hydrology (Surface Water Quality and Quantity)	• Temporary or permanent impacts and/or loss of function of the wetland areas, ephemeral drainages, ditches, watercourses • Spills and/or erosion and sedimentation into the wetlands, drainages, and watercourses during construction • Reduced surface water quality (i.e., erosional issues creating sedimentation) • Localized alteration of natural flow patterns (from any isolated instream excavations and dewatering activities)	• A spill containment kit should be retained on site to mitigate potential spills from construction equipment. Equipment and machines should not be fueled, washed or serviced within the vicinity of waterbodies. • Erosion and Sediment Control (ESC) measures should be used on site during construction to prevent sediment / material movement off-site or siltation into the surrounding waterbodies. • Any work conducted below the high-water mark or instream (i.e. placing riprap) should be isolated, if water is present at the time of construction, to maintain clean flow downstream / around the work zone at all times. • Where possible, natural bed and bank contours should be maintained or returned to pre-construction condition. • It is recommended that temporary workspaces, and other activities be planned to avoid and set back from wetlands where possible. • If any activity is planned within a wetland, a *Water Act* Approval via a Code of Practice Notification (GOA 2013b), Wetland Assessment and Impact Form (WAIF) (GOA 2018) or WAIR may be required prior to construction, depending on the type of activity planned.
Watercourses/ Drainages (if works are instream or below the high water mark)	• Change in habitat structure and cover (i.e., loss of riparian vegetation and physical disruption to the bed and banks) • Change in sediment concentrations (increase erosion potential, instream excavation activities, dewatering activities, and physical disruption to bed and banks) • Change in access to habitats (i.e., alteration in water depth, flow, and/or substrate size preventing migration) • Change in contaminant concentrations (i.e., oil, grease or fuel leaks from equipment) • Change in displacement or stranding of fish (i.e., isolation works) • Direct mortality or damage to fish (from equipment and materials)	• Ensure appropriate ESC measures are in place to prevent sediment/material movement off site and sedimentation or siltation. • Ensure that a hydrocarbon spill containment kit is retained on site to mitigate for potential spills from construction equipment. In order to prevent spills and contamination, ensure that equipment and machines are not fueled, washed, or serviced within the vicinity of ephemeral drainages or watercourses. Avoid storing topsoil and subsoil piles as well as equipment within waterbodies, if any excavation work is to occur. • If construction activities (e.g., open excavation, machinery, watercourse isolation, etc.) could temporarily limit the publics' ability to navigate through the site on small and large permanent watercourses, during the open water season, post appropriate signage upstream and downstream of the work area and facilitate public access around the site (e.g., detours, etc.) in addition to implementing as per TC permit or authorization conditions. • Construction should occur outside of the applicable RAPs, wherever possible. If work is conducted inside the RAP, a Qualified Aquatic Environmental Specialist (QAES) assessment of the watercourse(s) may be required and additional approvals (i.e., DFO Review) obtained.

Resource Component	Potential Effect	Recommended Mitigation Measures
	• Potential spread of whirling disease and/or invasive aquatic species.	• If construction activities occur below the high water mark and water is present at the time of construction, isolation of the work zone should be implemented to prevent transporting sediment into watercourses. Mitigation measures stated in DFO's Interim Code of Practice for End of Pipe and for Temporary Cofferdams should be adhered to (Refer to Table 6 for notifications/authorizations). • For works below the high water mark or instream, a Water Quality Monitoring program should be implemented by a QAES prior to construction and during project activities to monitor the effectiveness of the isolation and the introduction of deleterious substances (i.e., sedimentation) into the watercourse(s). • If isolation is used, a fish rescue completed by a QAES should be implemented to remove fish trapped within the isolated work area. Retain a QAES to ensure applicable permits (i.e., Fish Research Licence) for relocating fish are obtained prior to capturing fish trapped within an isolated area and safely relocating them to an appropriate location up or downstream. • All equipment and machinery working within the watercourse must be equipped with spill kits. An appropriately equipped watercourse specific spill kit and safety equipment shall be on-site and placed along the banks prior to and during all construction works, crews must be familiar with spill response procedures and if a spill does occur, the spill must be reported to the AEP Release Reporting Program at **1-800-222-6514**. • All equipment working within the high-water mark should be cleaned as per AEP's Appendix D: Decontamination Instructions for Industrial and Construction Operations of AEP's Decontamination Protocol for Work in or Near Water (AEP 2020b). Documentation verifying decontamination should be readily available onsite.

5 SUMMARY

A desktop assessment and high-level site investigation was conducted for the proposed CN Rail Line pathway project. Government database searches regarding protective land notations, land jurisdictions, contamination sources, sensitive species and habitats were searched with the results summarized and mapped.

An on-site investigation was conducted between October 27 and 29, 2020. The wildlife habitat and dominant vegetation was recorded along the ROW. Occurrences of seven *Noxious* weed species, nine introduced species, signs of wildlife usage (i.e., twenty-two small and nine medium sized nests, seven nest boxes, twenty two ungulate trails, one mineral lick and one potential den site) as well as a marsh and shrubby swamp wetland, four ephemeral drainages, three large permanent watercourses, 17 small permanent watercourses, and one intermittent watercourse watercourses were recorded. Black Knot and potential sources of contamination was also incidentally noted.

Mitigation measures to reduce the spread of weed species, protect wildlife and rare plant habitats as well as watercourses, ephemeral drainages and wetlands during construction have been provided for consideration. Potential regulatory requirements have been outlined; however, they should be reviewed once the project design and construction timing is known further.

6 SIGNATURES

If you have any questions in relation to this report, please contact the undersigned for additional information or with any questions or comments.

Yours truly,

GHOSTPINE ENVIRONMENTAL SERVICES LTD.

Field work and Reporting Contributions by:

Craig Rudolph, B.A., Dip. EAR
Environmental Scientist

Jenna Pilon, M.Sc., B.ES, B.I.T.
Terrestrial Biologist

Reporting Contributions by:

Wayne Bessie, M.Sc., P.Biol.
Senior Terrestrial Biologist, Environmental Planner

Reporting and Reviewed by:

Sheryl Faminow, M.N.R.M., P.Biol., R.P. Bio.
Principal, Senior Terrestrial Biologist

Tyler Ray, P.Biol., R.P. Bio.
Senior Fisheries Biologist

Modifications of any kind to this document, without express written permission, will render all signatures and professional stamps null and void.

T 403-291-9238 | **F** 403-291-9103
111, 10699 46 Street SE
Calgary, Alberta T2C 5C2

7 REFERENCES

Abacus Datagraphics. 2020. AbaData. [Online]. Available from: http://www.abacusdatagraphics.com/abadata-login.asp [Accessed: November 12, 2020].

ACIMS (Alberta Conservation Information Management System). 2017. Alberta Conservation Information System Search. Alberta Tourism, Parks and Recreation. October 2017.

AEP (Alberta Environment and Parks). 2020a. 2020 Alberta Guide to Hunting Regulations. Alberta Government. Published annually by Sports Scene Publications Incorporated, Edmonton Alberta. [Online]. Available from: https://albertaregulations.ca/huntingregs/season-wmus.html [Accessed: November 9, 2020]

AEP. 2020b. Whirling Disease Decontamination Risk Zone: Whirling Disease Program, Fish and Wildlife Policy Branch, Alberta Environment and Parks, Government of Alberta, Date of Map: March 16, 2020.

AEP. 2020c. Decontamination Protocol for Work in or Near Water. Updated July 2020 [Online]. Available from: https://open.alberta.ca/publications/9781460148204.

AEP. 2017. Alberta Wild Species General Status Listing – 2015. [Online]. Available from: http://aep.alberta.ca/fish-wildlife/species-at-risk/wild-species-status-search.aspx [Accessed: Month Day, Year].

AEP. 2016. Wildlife Sensitivity Maps - Data Sets. [Online]. Updated April 28, 2016. Available from: http://esrd.alberta.ca/forms-maps-services/maps/wildlife-sensitivity-maps/default.aspx.

Alberta Environment and Sustainable Resource Development. 2015. Alberta Wetland Classification System. Water Policy Branch, Policy and Planning Division, Edmonton, Alberta.

Alberta Native Plant Council. 2012. ANPC Guidelines for Rare Vascular Plant Surveys in Alberta – 2012 Update. Alberta Native Plant Council. Edmonton, Alberta. [Online]. Available from: http://anpc.ab.ca/wp-content/uploads/2015/01/Guidelines-For-Rare-Plant-Surveys-in-AB-2012-Update.pdf [Accessed: November 9, 2020].

Alberta Parks. 2020. Midland Provincial Park. https://www.albertaparks.ca/parks/central/midland-pp/

ASRD (Alberta Sustainable Resource Development). 2009. Rangeland Health Assessment for Grassland, Forest and Tame Pasture. Revised March 2016. Prepared by ASRD Lands Division, Rangeland Management Branch. Pub. No. T/044.

ASRD (Alberta Sustainable Resource Development). 2011. *Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat Within Grassland and Parkland Natural Regions of Alberta*. April 2011. Last Updated July 13, 2015. Fish and Wildlife Division.

Borneuf, D. 1983. *Springs of Alberta*. Alberta Research Council. Earth Sciences Report 1982-03.

CCME (Canadian Council of Ministers of the Environment). 2020. *Canadian Environmental Guidelines*. Canadian Environmental Quality Guidelines. [Online]. Available from: http://ceqg-rcqe.ccme.ca/en/index.html [Accessed: November 2020].

CESCC (Canadian Endangered Species Conservation Council). 2016. Wild Species 2015: The General Status of Species in Canada. National General Status Working Group: 128 pp.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2017. Canadian Wildlife Species at Risk. October 2017.

DFO (Fisheries and Oceans Canada) 2020a. Projects Near Water Website. https://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html

DFO. 2020b. *Interim Code of Practice: End of Pipe Fish Protection Screens for Small Water Intakes in Freshwater.* Available Online: https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html. Accessed October 2020.

DFO. 2020c. *Interim Code of Practice: Temporary Cofferdams and Diversion Channels.* Available Online: http://www.dfo-mpo.gc.ca/pnw-ppe/codes/cofferdams-batardeaux-eng.html. Accessed: September 2020.

DFO. 1995. *Freshwater Intake End of Pipe Fish Screen Guideline*. Communications Directorate. Ottawa, Ontario.

Environment Canada. 2019. *Guidelines to Reduce Risk to Migratory Birds*. [Online]. Available from https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html#toc5

Environment Canada. 2018. *General Nesting Periods of Migratory Birds in Canada*. [Online]. October 2018. Available from: http://ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#cn-tphp.

Environment Canada 2007c. National Climate Data and Information Archive. Canadian Climate Normals 1971-2000 Coronation A Weather Station. Website. http://www.climate.weatheroffice.ec.gc.ca/climate_normals/results_e.html?Province=ALL&StationName=coronation&SearchType=BeginsWith&LocateBy=Province&Proximity=25&ProximityFrom=City&StationNumber=&IDType=MSC&CityName=&ParkName=&LatitudeDegrees=&LatitudeMinutes=&LongitudeDegrees=&LongitudeMinutes=&NormalsClass=A&SelNormals=&StnId=1854&&autofwd=1

GC (Government of Canada). 2019. *Canadian Navigable Waters Act*. (RSC 1985, c. N-22). Current as of August 25, 2020. Last amended October 04, 2019. Department of Justice. Ottawa, Ontario.

GC. 2002. *Species At Risk Act* (S.C. 2002, c. 29). Current to December 12, 2018. Last amended on May 30, 2018. Minister of Justice. Ottawa, Ontario.

GC. 1994. *Migratory Birds Convention Act* (S.C. 1994, c. 22). Current to December 12, 2018. Last amended on December 12, 2017. Department of Justice. Ottawa, Ontario.

GC. 1985a. *Seeds Act*. (RSC 1985, c. S-8),. Current as of August 25, 2020. Last amended January 15, 2019. Department of Justice. Ottawa, Ontario.

GC. 1985b. *Fisheries Act.* (RSC 1985, c. F-14). Current as of August 25, 2020. Last amended August 28, 2019. Department of Justice. Ottawa, Ontario.

GOA (Government of Alberta). 2020. Black Knot. Government of Alberta [Online]. Available from: https://www.alberta.ca/black-knot.aspx [Accessed November 9, 2020].

GOA. 2018. Wetland Assessment and Impact Form. Effective January 11, 2018. Government of Alberta. Edmonton, Alberta

GOA. 2017. Alberta Wetland Assessment and Impact Report Directive. Effective June 2017. Effective June 1, 2015. Government of Alberta. Edmonton, Alberta.

GOA. 2013a. *Sensitive Species Inventory Guidelines*. April 2013. [Online]. Last updated October 29, 2015. Available from: http://esrd.alberta.ca/fish-wildlife/wildlife-management/sensitive-species-inventory-guidelines.aspx [Accessed: April 1, 2013].

GOA. 2013b. *Code of Practice for Watercourse Crossings*. Includes Amendment to June 24, 2013. Alberta Queen's Printer. Edmonton, Alberta.

GOA. 2010a. Weed Control Regulations (AR 19/2010). With amendments up to and including Alberta Regulation 125/2016. Alberta Queen's Printer. Edmonton, Alberta.

GOA. 2010b. *Environmental Code of Practice for Pesticides*. Effective May 12, 2010. Made under the *Environmental Protection and Enhancement Act*, RSA 2000, cE-12. Alberta Queen's Printer. Edmonton, Alberta.

GOA. 2008. *Weed Control Act* (2008, c. W-5.1). Current as of December 15, 2017. Alberta Queen's Printer. Edmonton, Alberta.

GOA. 2006. Brooks Management Area Map. Water Act Code of Practice for Watercourse Crossings. November 2006. Alberta Queen's Printer. Edmonton, Alberta.

GOA. 2000a. Red Deer River Corridor Integrated Management Plan. Government of Alberta [Online]. Available from: https://open.alberta.ca/publications/0778511650 [Accessed November 9, 2020].

GOA. 2000b. *Wildlife Act* (RSA 2000, c. W-10). Current as of February 20, 2018. Alberta Queen's Printer. Edmonton, Alberta.

GOA. 2000c. *Water Act* (RSA 2000, c. W-3). Current as of December 15, 2017. Alberta Queen's Printer. Edmonton, Alberta.

GOA 2000d. *Public Lands Act* (RSA 2000, c. W-10_ Current as of February 20, 2018. Alberta Queen's Printer, Edmonton, Alberta.

Kathiresan R, Sureshkumar S, Sathappan C, Jabarathinam T, Rameshkumar S. 2011. Integrated Weed Management in Flower Crops Involving Goat Grazing and Polyethylene Mulching. 23rd Asian-Pacific Weed Science Conference. 127-133.

Kirby D, Sedivec K, Lym R. 1997. Leafy spurge control with angora goats and herbicides. Journal of Range Management. 50: 123-128.

Natural Regions Committee. 2006. *Natural Regions and Subregions of Alberta*. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852.

Olive J, Knight P, Wehtje G, Eakes J, Gilliam C, Cochran D. 2009. Mulch Depth Affects Weed Germination. Journal of Environmental Horticulture. 27: 85-90.

Osoro K, Garcia U, Celaya R, Garcia R. 2012. Goat grazing, its interactions with other herbivores and biodiversity conservation issues. Small Ruminant Research. 107: 49-64.

Percival D, Lynch D, Burkhard N. Effects of Pine-Needle and Compost Mulches and Weeds on Nitrogen Dynamics in an Organically-Managed Highbush Blueberry Field. International Society for Horticultural Science. 873: 253-260.

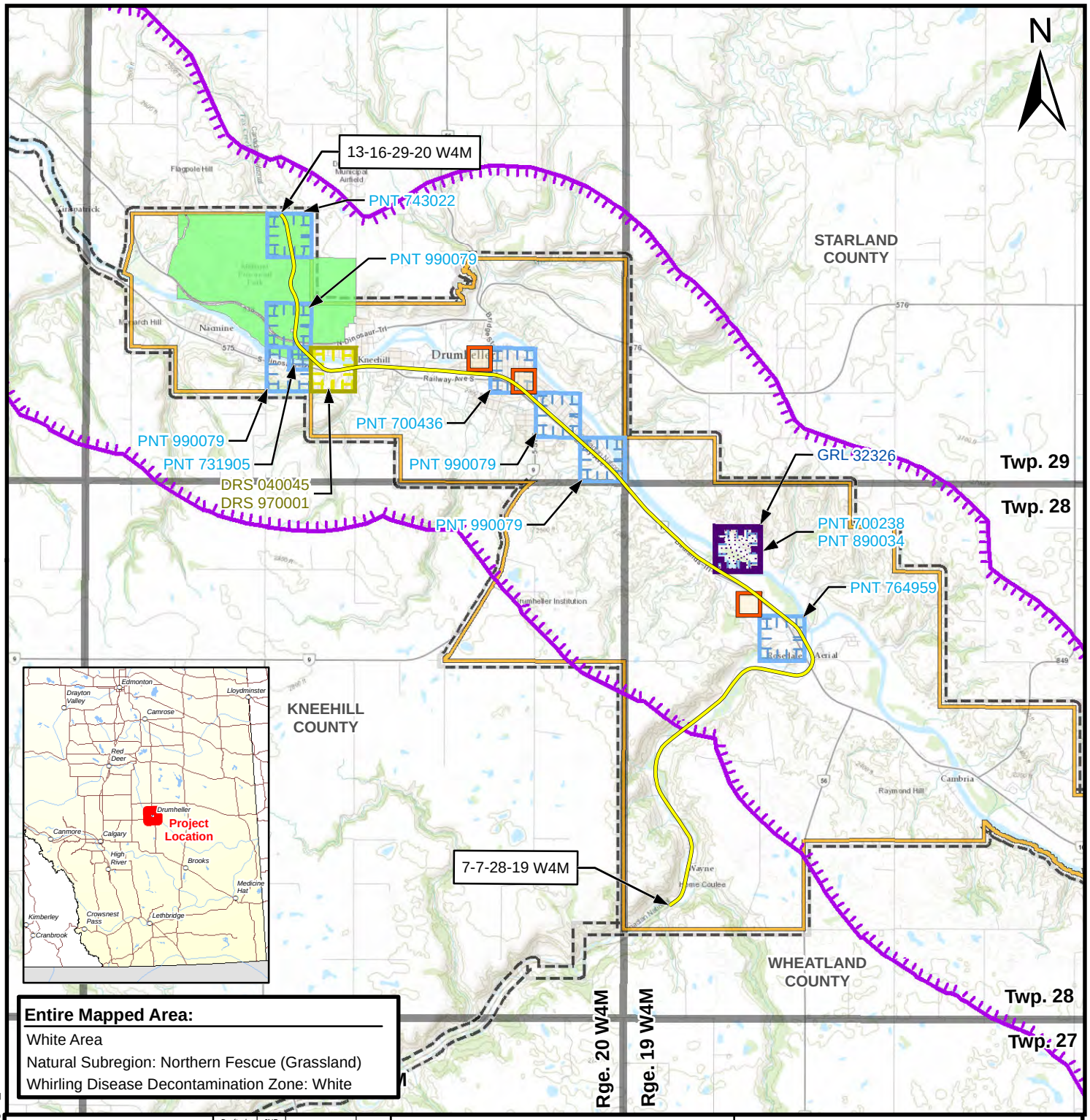
Rakow D, Greenly K. 1995. ThI dide Effect of Wood Mulch Type and Depth on Weed and Tree Growth and Certain Soil Parameters. Journal of Arboriculture. 21: 225-232.

United Nations Environmental Programme, World Resources Institute, and The World Conservation Union. 1992. Global Biodiversity Strategy: Guidelines for action to save, study and use Earth's biotic wealth sustainably and equitably. ISBN: 0-915825-74-0.

West N, Al-Rowaily S, Kronberg S, Walker J. 1994. Comparison of sheep and goat preferences for leafy spurge. Journal of Range Management. 47: 429-434.

APPENDIX A

FIGURES



Entire Mapped Area:

White Area

Natural Subregion: Northern Fescue (Grassland)

Whirling Disease Decontamination Zone: White

SCALE: 1:100,000

m

500 0 500 1,000

Drafted:	JNB	Date:	Revision:
QA/QC:	NG	November 25, 2020	1
Development Source:	SF	Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
ESRI World Topographic Map
ATS Grid: AltaLIS 2007.
* Geographic Land Information Management and Planning System, Gov AB 2020/10/20
** AbaData 2.0

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

- Proposed Pathway
- Town of Drumheller Boundary
- Rural Boundary
- Midland Provincial Park
- Subregional Integrated Resource Management Plans - Red Deer River Corridor Boundary

Dispositions*:

- DRS Disposition
- GRL 32326
- PNT Disposition

Spills and Complaints:**

- Spills & Complaints

KERR WOOD LEIDAL

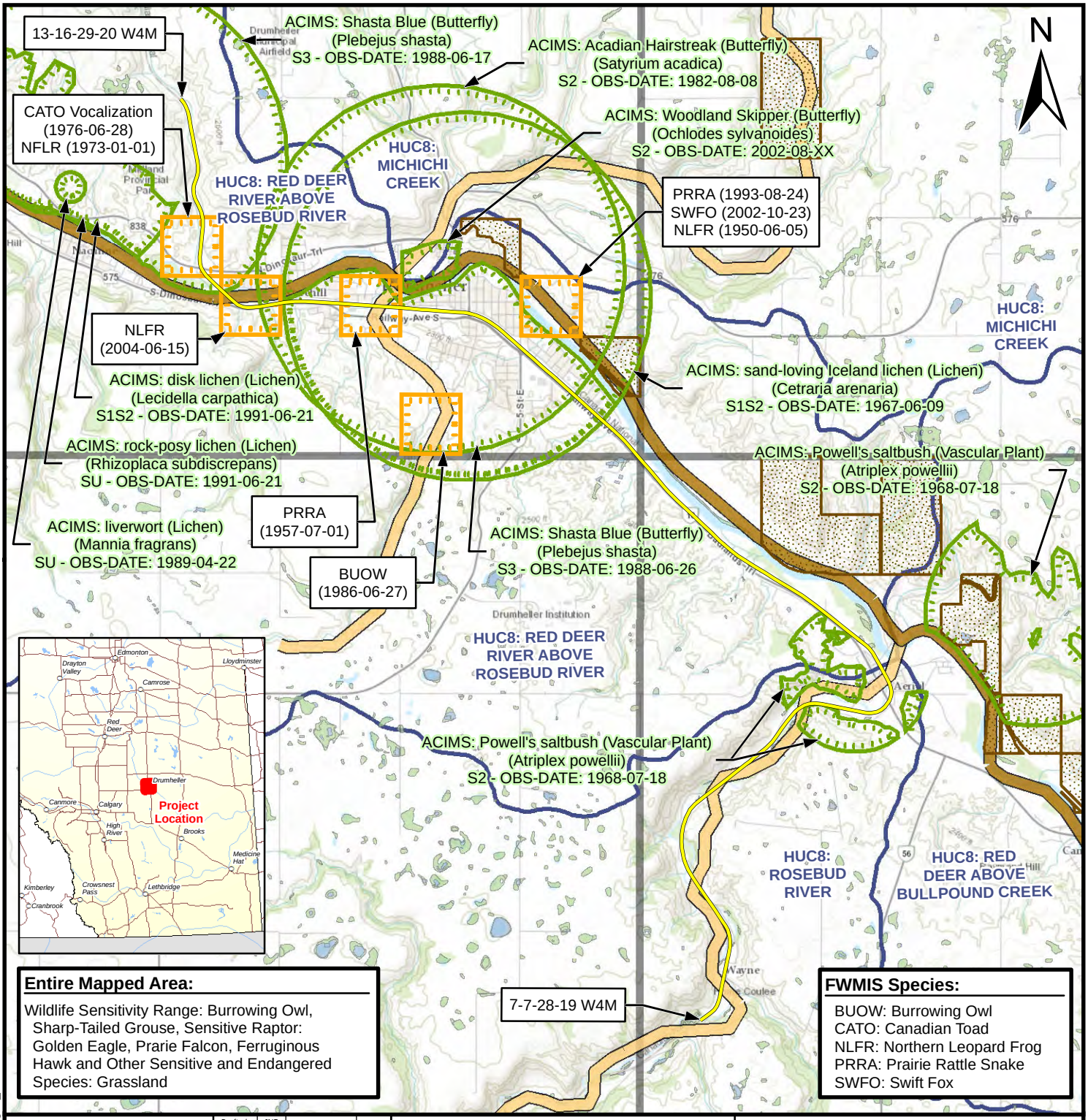
Administrative Information and Land Status for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

November 2020

REF.: 5605
(PreSite)

Figure 1

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig01_PreSite.mxd



Entire Mapped Area:

Wildlife Sensitivity Range: Burrowing Owl, Sharp-Tailed Grouse, Sensitive Raptor: Golden Eagle, Prarie Falcon, Ferruginous Hawk and Other Sensitive and Endangered Species: Grassland

FWMIS Species:

BUOW: Burrowing Owl
CATO: Canadian Toad
NLFR: Northern Leopard Frog
PRRA: Prairie Rattle Snake
SWFO: Swift Fox

SCALE: 1:75,000

500 0 500 1,000 m

Drafted:	JNB	Date:	Revision:
QA/QC:	NG		
Approved:	SF	November 23, 2020	1
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
ESRI World Topographic Map
ATS Grid: AltaLIS 2007.
*AMWI = Alberta Merged Wetland Inventory

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

- Proposed Pathway
- Class C, RAP: April 16 to June 30
- Class C, RAP: April 16 to July 15
- HUC8 Watershed Boundary
- ACIMS
- FWMIS
- Central Parkland & Northern Fescue Grassland Area (LAT)

AMWI*: Marsh Open Water

KERR WOOD LEIDAL

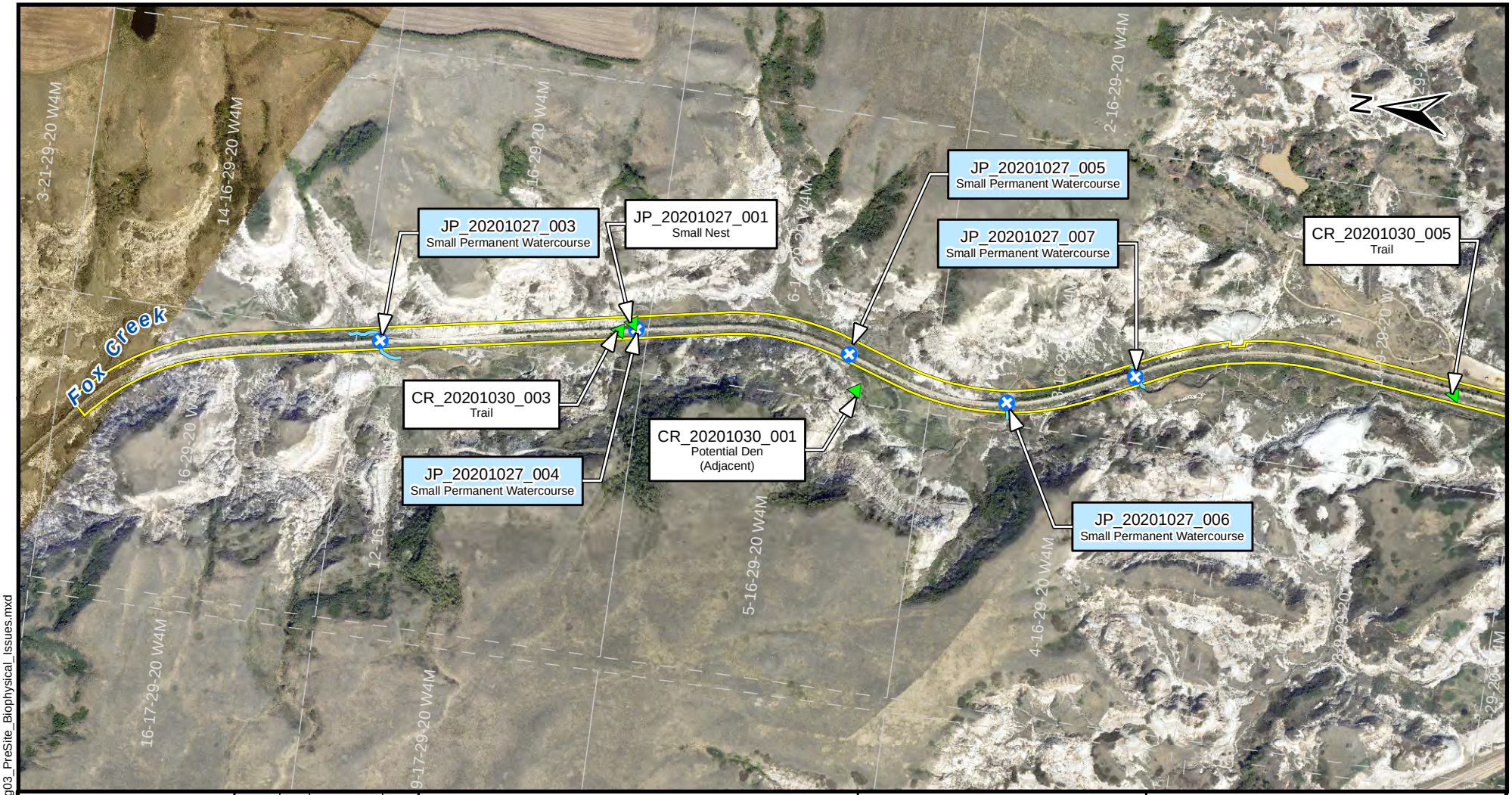
Biophysical and Hydrological Information for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

November 2020

REF.: 5605
(PreSite)

Figure 2

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig02_PreSite.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	*Date:*	*Revision:*
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		*Date:*	*Revision:*
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

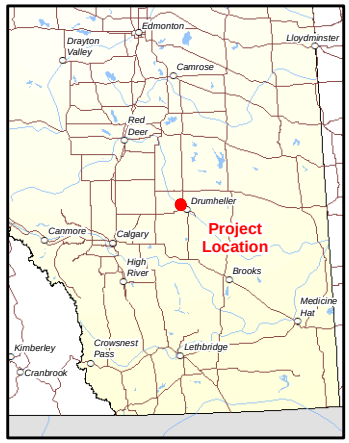
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Ditch
- Ephemeral Drainage
- Watercourse
- Potential Well
- Structure
- Weed
- Wildlife Issue
- Black Knot
- Wetland Boundary

*Approximate location based on field survey.



KERR WOOD LEIDAL

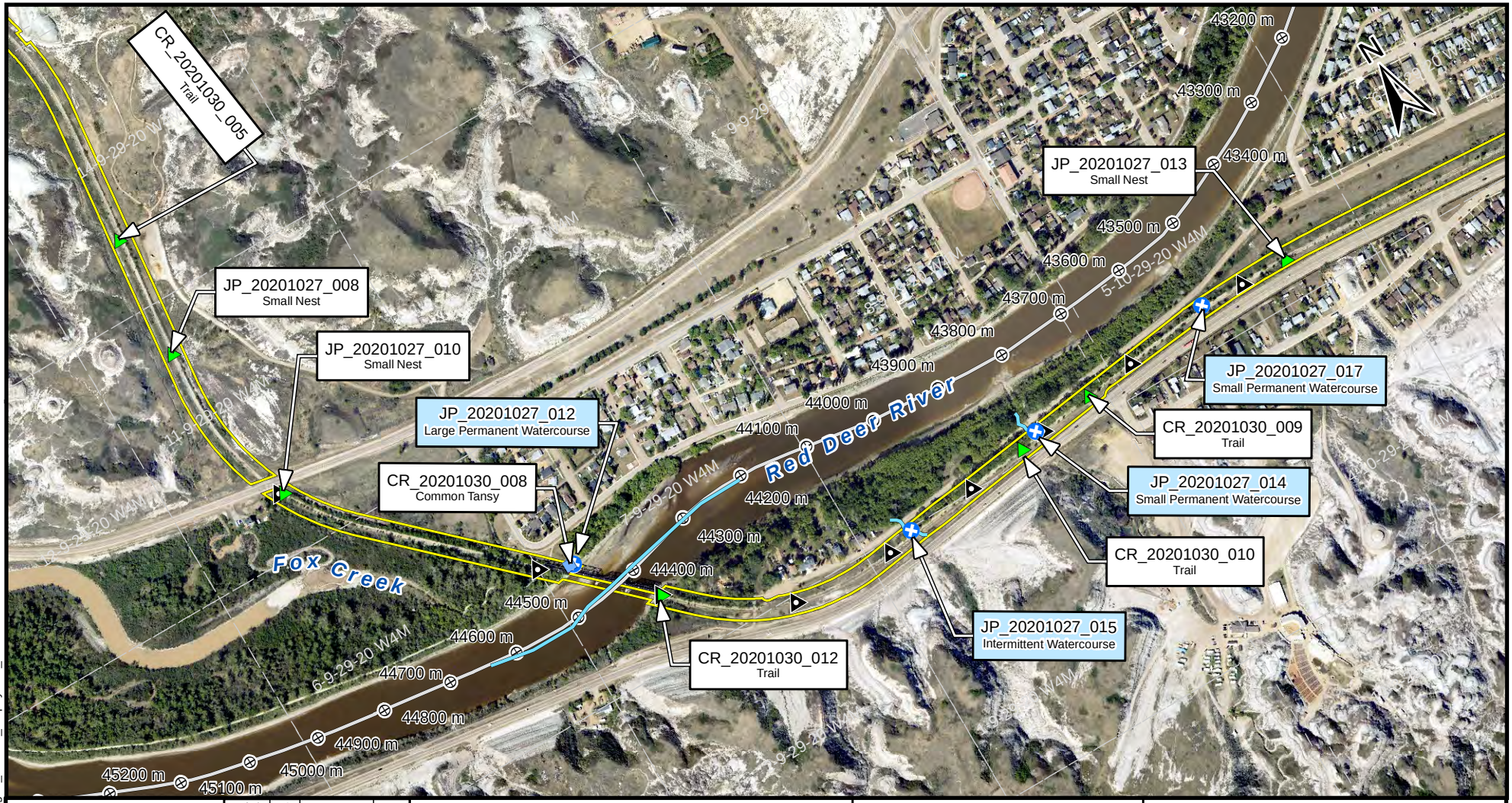
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-A

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	*Date:*	*Revision:*
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		*Date:*	*Revision:*
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

Proudly Serving Western Canada 21 Years

Legend

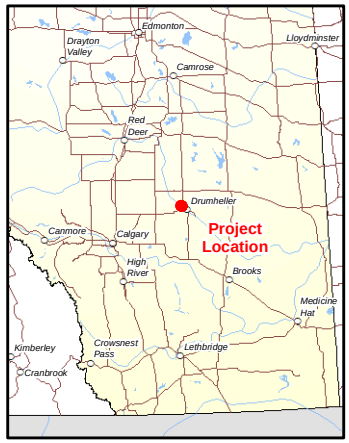
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Ditch
- Ephemeral Drainage
- Watercourse
- Outflow Structure
- Weed
- Wildlife Issue
- Black Knot
- Wetland Boundary
- NHC Stationing**
- Red Deer River NHC Centerline**

*Approximate location based on field survey.



KERR WOOD LEIDAL

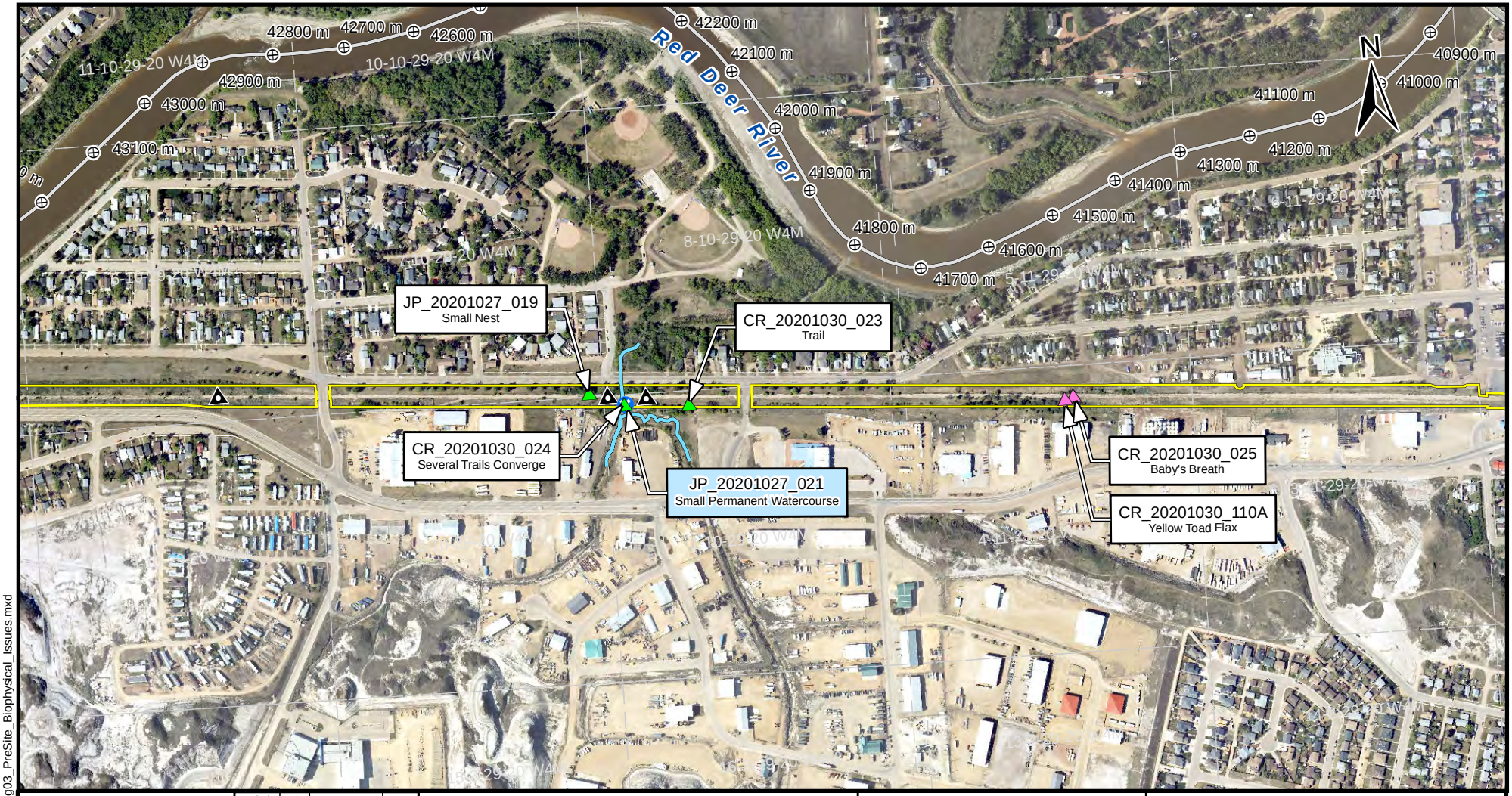
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-B

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	Date:	Revision:
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

Proudly Serving Western Canada 21 Years

Legend

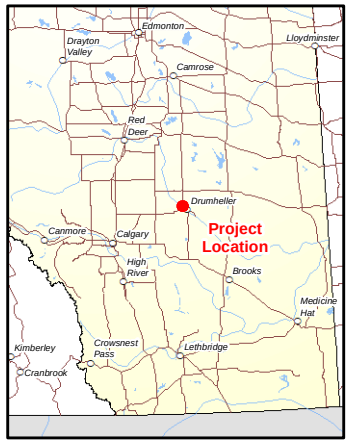
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Weed
- Wildlife Issue
- Black Knot
- Ditch
- Ephemeral Drainage
- Watercourse
- Wetland Boundary
- NHC Stationing**
- Red Deer River NHC Centerline**

*Approximate location based on field survey.



KERR WOOD LEIDAL

Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-C

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd

SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	*Date:*	*Revision:*
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		*Date:*	*Revision:*
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

Proudly Serving Western Canada 21 Years

Legend

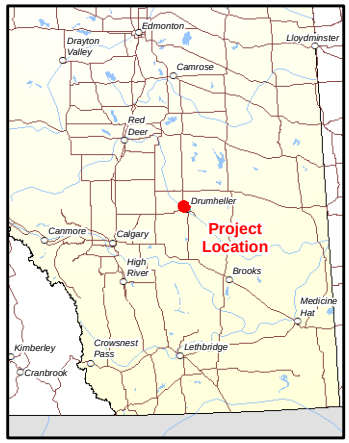
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Weed
- Wildlife Issue
- Black Knot
- Ditch
- Ephemeral Drainage
- Watercourse
- Wetland Boundary
- NHC Stationing**
- Red Deer River NHC Centerline**

Approximate location based on field survey.



KERR WOOD LEIDAL

Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-D

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd

SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	*Date:*	*Revision:*
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		*Date:*	*Revision:*
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

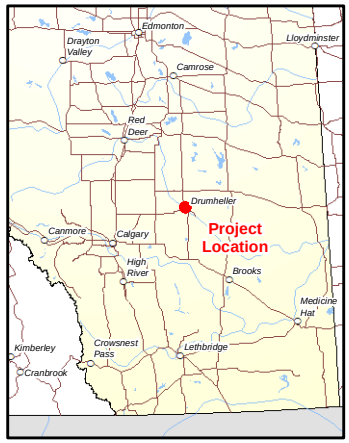
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Weed
- Wildlife Issue
- Black Knot
- Ditch
- Ephemeral Drainage
- Watercourse
- Wetland Boundary
- NHC Stationing**
- Red Deer River NHC Centerline**

*Approximate location based on field survey.



KERR WOOD LEIDAL

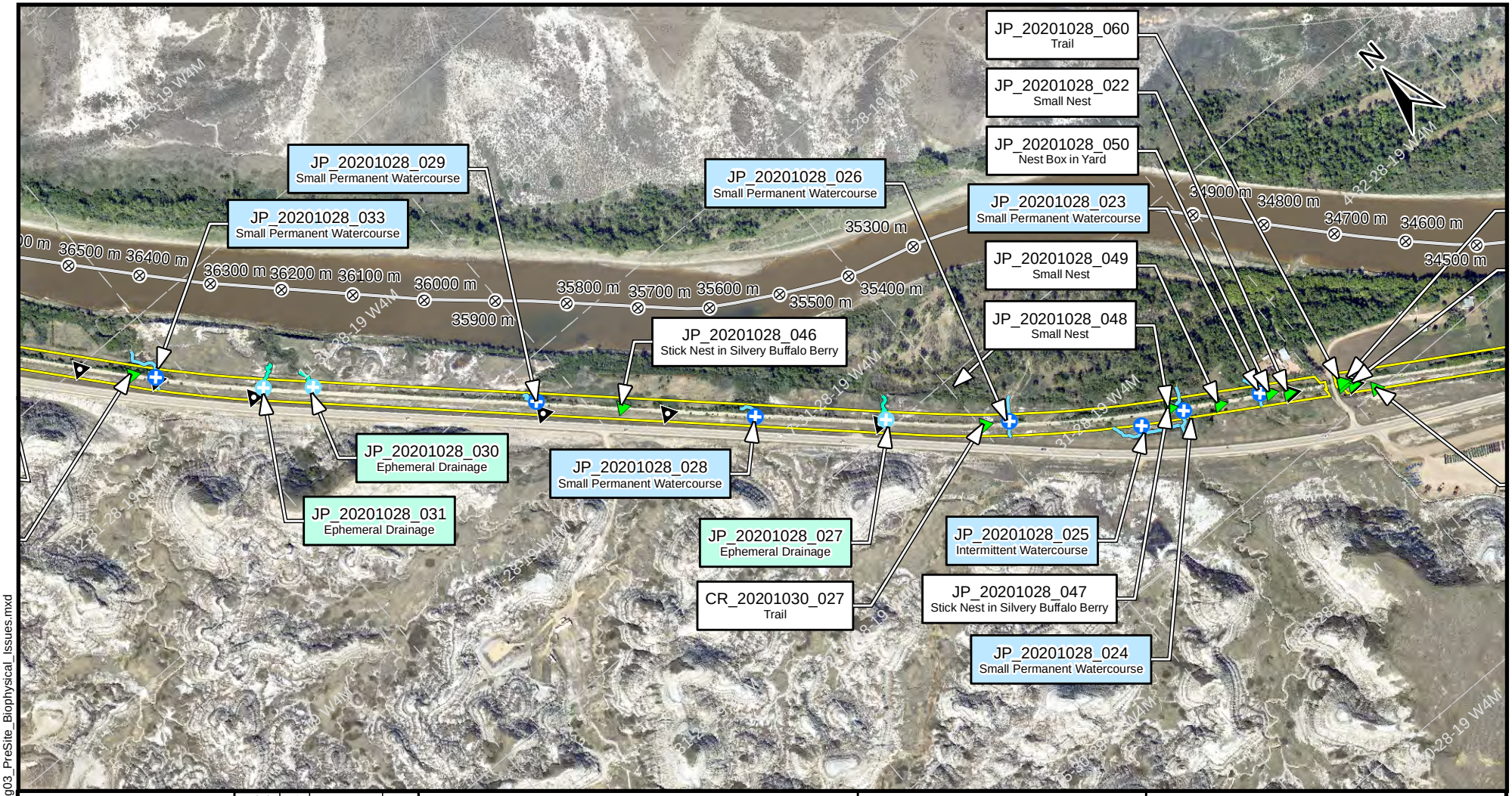
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-E

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	Date:	Revision:
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

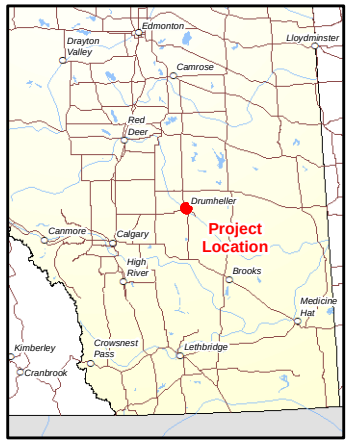
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Weed
- Wildlife Issue
- Black Knot
- Ditch
- Ephemeral Drainage
- Watercourse
- Wetland Boundary
- NHC Stationing**
- Red Deer River NHC Centerline**

*Approximate location based on field survey.



KERR WOOD LEIDAL

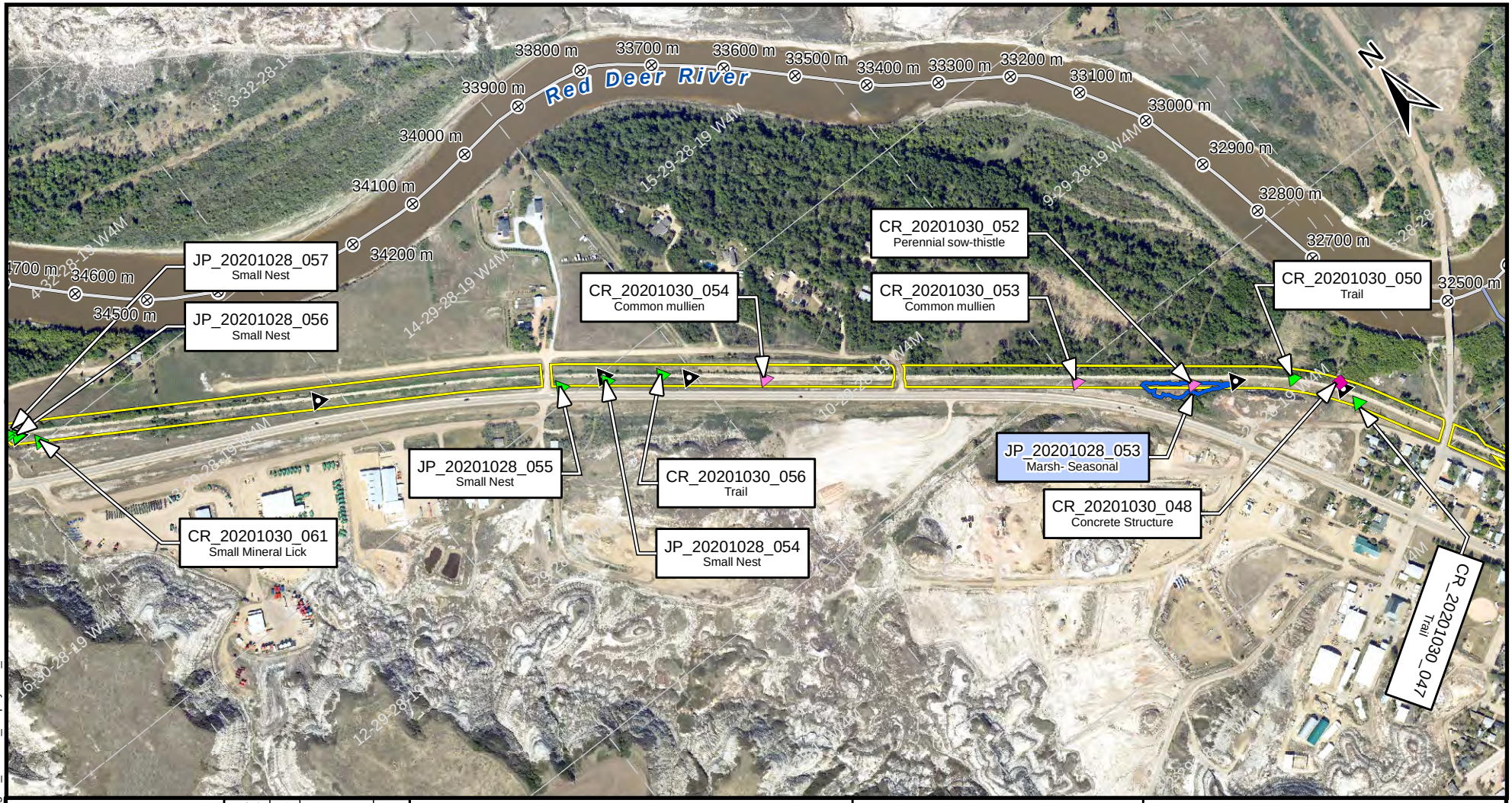
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-F

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	Date:	Revision:
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

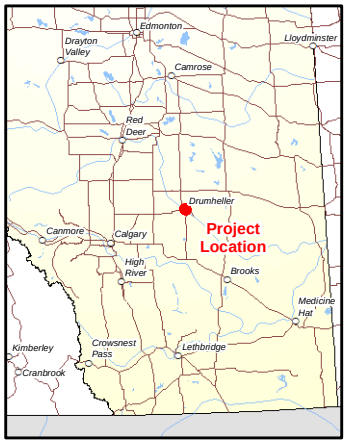
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Ditch
- Ephemeral Drainage
- Watercourse
- NHC Stationing**
- Red Deer River NHC Centerline**
- Structure
- Weed
- Wildlife Issue
- Black Knot
- Wetland Boundary

*Approximate location based on field survey.



KERR WOOD LEIDAL

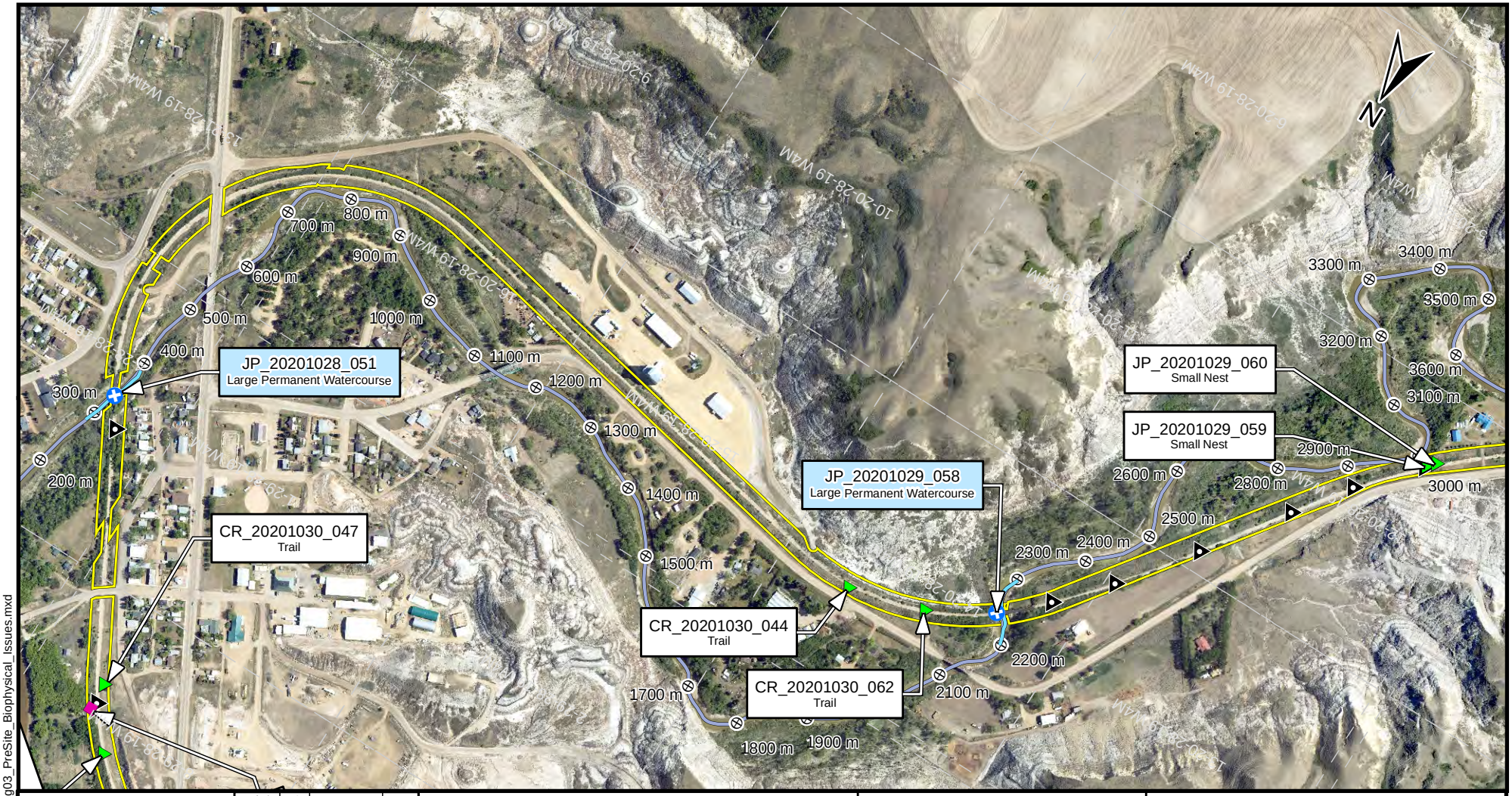
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-G

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	Date:	Revision:
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

Proudly Serving Western Canada 21 Years

Legend

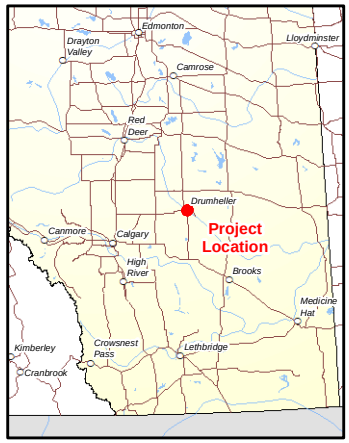
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Ditch
- Ephemeral Drainage
- Watercourse
- NHC Stationing**
- Rosebud River NHC Centerline**
- Structure
- Weed
- Wildlife Issue
- Black Knot
- Wetland Boundary

*Approximate location based on field survey.



KERR WOOD LEIDAL

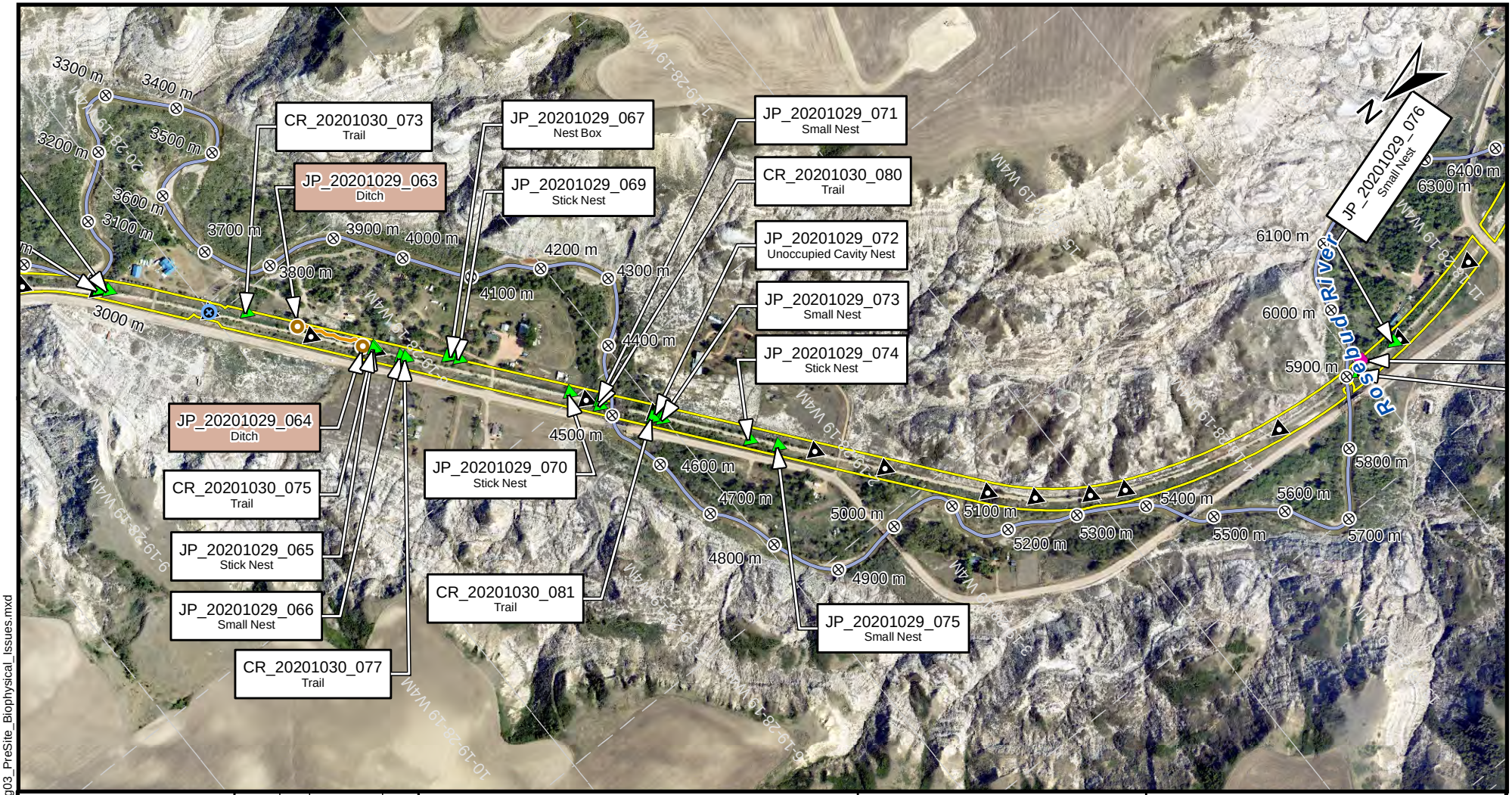
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-H

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	Date:	Revision:
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

Proudly Serving Western Canada 21 Years

Legend

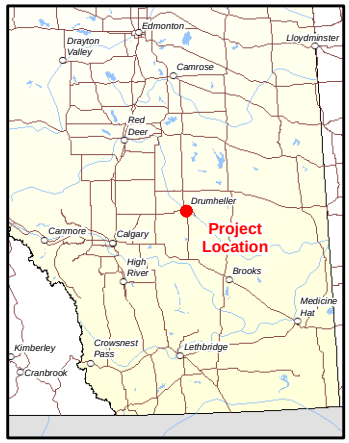
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Ditch
- Ephemeral Drainage
- Watercourse
- NHC Stationing**
- Rosebud River NHC Centerline**
- Potential Well
- Structure
- Weed
- Wildlife Issue
- Black Knot
- Wetland Boundary

*Approximate location based on field survey.



KERR WOOD LEIDAL

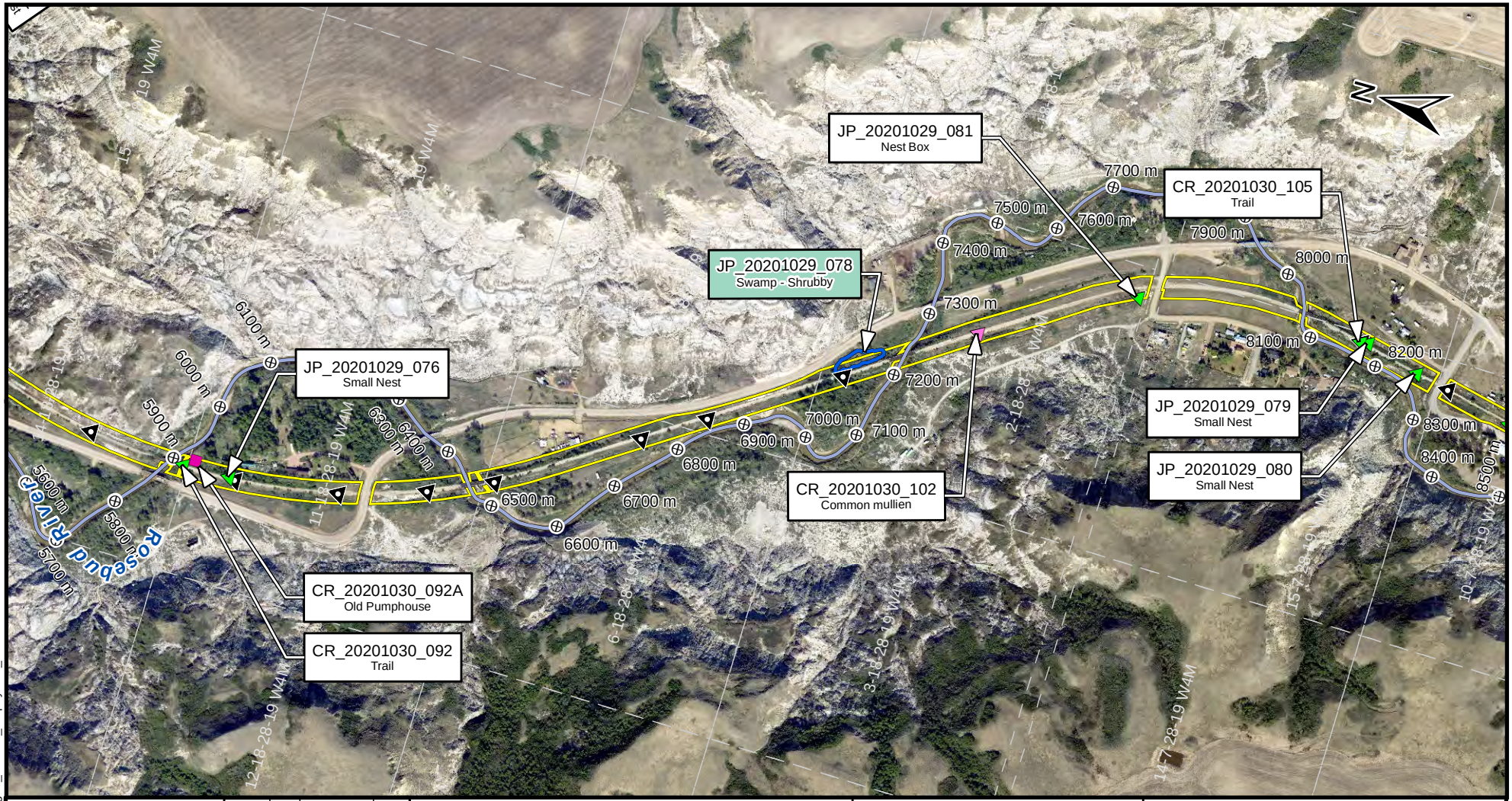
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-I

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

50 0 50 100 m

Drafted:	NG	Date:	Revision:
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		Date:	Revision:
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

Proudly Serving Western Canada 21 Years

Legend

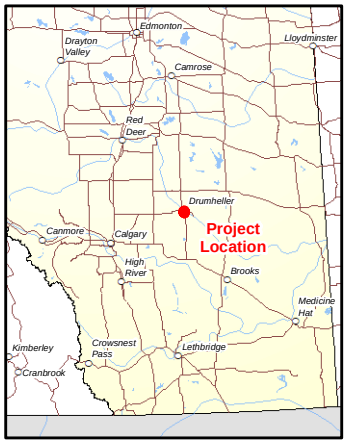
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Ditch
- Ephemeral Drainage
- Watercourse
- NHC Stationing**
- Rosebud River NHC Centerline**
- Structure
- Weed
- Wildlife Issue
- Black Knot
- Wetland Boundary

*Approximate location based on field survey.



KERR WOOD LEIDAL

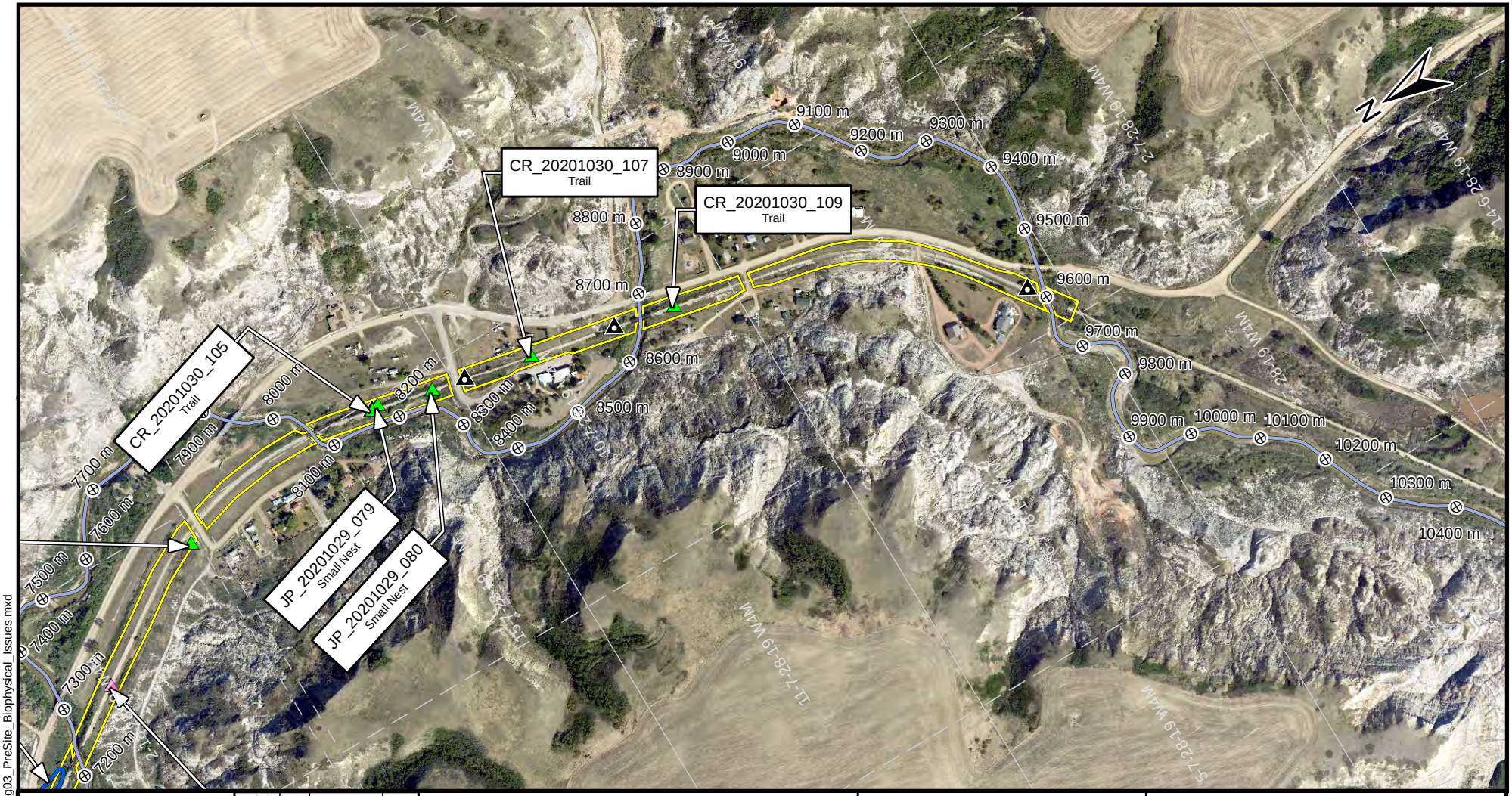
Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-J

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd



SCALE: 1:8,000

m
50 0 50 100

Drafted:	NG	*Date:*	*Revision:*
QA/QC:	JNB		
Approved:	SF	December 23, 2020	3
Development Source:		*Date:*	*Revision:*
Survey Plan		October 13, 2020	N/A

Data Sources:
Imagery Source: Kerr Wood Leidal Date: 2019
ATS Grid: AltaLIS 2007.
**: NHC Data Provided by Kerr Wood Leidal

Please contact Ghostpine Environmental Services Ltd. for all other sources.

Although we have no reason to doubt the accuracy and completeness of the data used to generate this product, users should be aware that errors in the data may be present.

Ghostpine Environmental Services Ltd.

PROUDLY SERVING WESTERN CANADA 21 YEARS

Legend

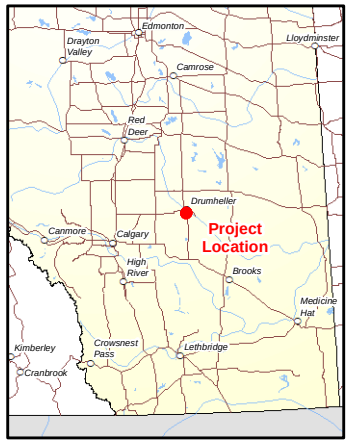
Routing:

- Proposed Pathway

Biophysical Issues*:

- Ditch
- Ephemeral Drainage Crossing
- Watercourse Crossing
- Weed
- Wildlife Issue
- Black Knot
- Ditch
- Ephemeral Drainage
- Watercourse
- Wetland Boundary
- NHC Stationing**
- Rosebud River NHC Centerline**

*Approximate location based on field survey.



KERR WOOD LEIDAL

Field Observations for the Proposed Drumheller CN Rail Line Wildlife and Vegetation Assessment

December 2020

REF.: 5605
(PreSite)

Figure 3-K

Map Location: Y:\01_GISProject\00_5600_Proj\5605_GIS\5605_Fig03_PreSite_Biophysical_Issues.mxd

APPENDIX B

PHOTO PLATES

Plate 1 Old concrete structure with barrel associated with the railway ROW in 8-29-28-19 W4M.

Plate 2 Potential well associated with the railway ROW in 5-20-28-19 W4M.

Plate 3 **Potential old pumphouse adjacent to the ROW in 11-18-28-19 W4M**

Plate 4 **View to the north along the existing railway ROW in Midland Provincial Park on October 27, 2020. The railroad has been decommissioned and only the coarse gravel roadbed remains.**

Plate 5 The project area within Midland Provincial Park consists of native prairie and adjacent moderate steep sedimentary slopes. The view is to the north along the ROW, adjacent to the old railway bed (October 27, 2020)

Plate 6 Habitat surrounding a small permanent watercourse (JP-20201027_007) in SW 16-29-20 W4M includes chokecherry, willows, and Manitoba maple.

Plate 7 Red Deer River traversed by the project ROW in SE 9-29-20 W4M. Photo direction is to the southeast (JP_20201027_012).

Plate 8 Rosebud river traversed by the project ROW in SW 28-28-19 W4M. Photo direction is the the southeast (JP_20201027_051).

Plate 9 An example of Black Knot, a common disease of plants in the genus *Prumus* (Plums and Cherries).

Plate 10 Potential den site within SW 16-29-20 W4M. Approximately 70 m west of the ROW (October 27, 2020).

Plate 11 **Small nest in NW 16-29-20 W4M.**

Plate 12 **Example of the nesting boxes found along the fenceline in 13-31-28-19 W5M.**

Plate 13 Ungulate trail in NW 16-29-20 W4M. Photo direction is to the east (CR_20201030_003).

Plate 14 Mineral Lick in 4-32-28-19 W4M.

Plate 15 Seasonal marsh traversed by the project ROW in SE 29-28-19 W4M. Photo drection is the west (JP_20201028_053).

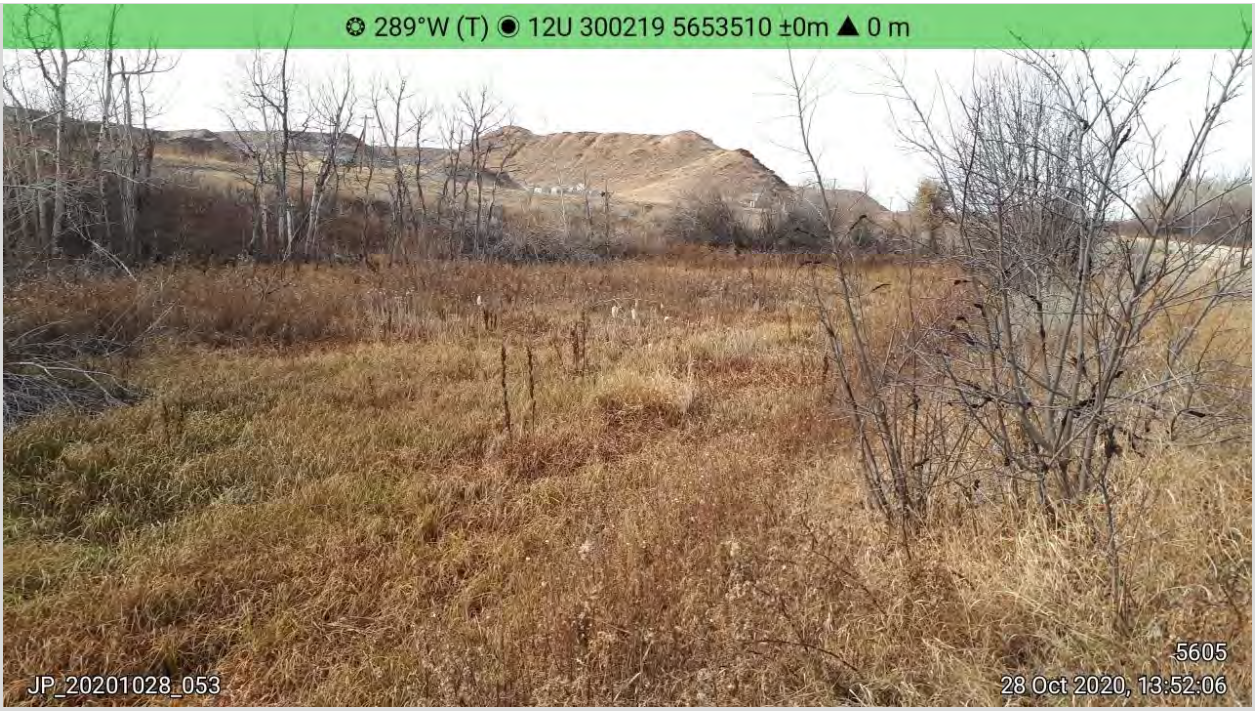


Plate 16 Shrubby swamp traversed by the project ROW in SE 18-28-19 W4M, Photo direction is to the southeast (JP_20201029_078).

Plate 17 Small permanent watercourse traversed by the project ROW in SE 31-28-19 W4M. Photo direction is the the north (JP_20201027_026).

Plate 18 Intermittent watercourse traversed by the project ROW in SE 9-29-20 W4M. Photo direction is to the north (JP_20201027_015).

Plate 19 Ephemeral drainage traversed by the project ROW in NW 31-28-19 W4M. Photo direction is to the northeast (JP_20201027_031).

Plate 20 Ditch traversed by the project ROW in SE 1-29-20 W4M. Photo direction is to the east (JP_20201028_39).

APPENDIX C

LISTINGS OF:

RARE PLANT COMMUNITIES, RARE VASCULAR PLANTS, LICHEN SPECIES OF CONCERN AND POTENTIAL WILDLIFE WITHIN THE PROJECT AREA

Table C-1 Rare Plant Communities Which Have Potential to Occur within the Project Area

SNAME [ACIMS]	SCOMNAME [ACIMS]	S_RANK	N_RANK	G_RANK	TRACK_STATUS	Habitat	Community Composition
Puccinellia nuttalliana community	Nuttall's salt-meadow grass community	S3?	NNR	G3?	Track	Saline or alkaline flats, near ponds or in seepage areas.	*Puccinellia nuttalliana* is dominant, with or without *Distichlis stricta Hordeum jubatum*, *Scirpus paludosus*, *Salicornia rubra* or *Triglochin maritima* may be present
Salicornia rubra emergent marsh	samphire emergent marsh	S2	NNR	G2G3	Track	Highly alkali wetlands or semi-permanent alkali lakes on or surrounding open mud areas, often next to upland grasses.	*Salicornia rubra* dominant (25% or less cover). Any of *Puccinellia nuttalliana, Distichlis stricta, Hordeum jubatum, Triglochin maritima, Chenopodium rubrum, C. salinum, Suaeda erecta* may be present
Crataegus chrysocarpa / Heracleum maximum - Urtica dioica - Viola canadensis shrubland	round-leaved hawthorn / cow parsnip - common nettle - western Canada violet shrubland	S1S2	NNR	GNR	Track	Slopes immediately below a spring or seep or alluvial terraces along streams and rivers.	*Crataegus chrysocarpa* is dominant in dense clumps. *Heracleum lanatum* and *Urtica dioica* are common. *Prunus virginiana, Ribes oxyacanthoides* and *Symphoricarpos occidentalis* may occur.
Distichlis stricta - Pascopyrum smithii meadow	salt grass - western wheat grass meadow	S2	NNR	GNR	Track	Saline soil areas, outer edge of weltands.	*Distichlis stricta* and *Pascopyrum smithii* are dominant. *Aster ericoides* and *Grindelia squarrosa* common.
Festuca hallii - Koeleria macrantha - Elymus lanceolatus grassland	plains rough fescue - June grass - northern wheat grass grassland	S1S2	NNR	GNR	Track	Well drained / gravelly soils, level terraces.	*Festuca hallii* is dominant. *Koeleria macrantha* and *Elymus lanceolatus* are common. *Carex obtusata, Stipa comata, Poa juncifolia, Vicia americana, Astragalus dasyglottis* and *Artemisia frigida common*
Festuca hallii - Koeleria macrantha / Juniperus horizontalis / forb grassland	plains rough fescue - June grass / juniper / forb grassland	S2	NNR	GNR	Track	dry steep south facing slopes, on regosols (typically clay).	*Festuca hallii*, *Koeleria macrantha* and *Juniperus horizontalis* are dominant. *Stipa curtiseta, Stipa viridula* and *Elymus lanceolatus* are common. *Thermopsis rhombifolia, Eriogonum flavum, Erigeron caespitosus* and *Hedysarum alpinum* may occur.

SNAME [ACIMS]	SCOMNAME [ACIMS]	S_RANK	N_RANK	G_RANK	TRACK_STATUS	Habitat	Community Composition
Festuca hallii grassland	plains rough fescue grassland	S1	NNR	GNR	Track	level terrain and lower slopes of undulating topography, black chernozem soils.	*Festuca hallii* dominant, *Stipa curtiseta* common at low cover. Rose species may be present (up to 25%)
Amphiscirpus nevadensis - (Triglochin maritima) emergent marsh	Nevada bulrush - (seaside arrow-grass) emergent marsh	S2S3	NNR	GNR	Track	Saline marshes with extreme variation in water level.	*Scirpus nevadensis* dominant. *Triglochin maritima* common. *Distichlis stricta* (dry edge) *Puccinellia nuttalliana* (wet edge) or *Suaeda calceoliformis* (alkali sites) may occur
Festuca hallii - Hesperostipa curtiseta grassland	plains rough fescue - western porcupine grass grassland	S2S3	NNR	GNR	Track	Undulating topography and hummocky terrain, on mesic to submesic sites. Often on south / west slopes. Black chernozems.	*Festuca hallii* and *Stipa curtiseta* are codominant. *Koeleria macrantha* is common. Prairie rose may be present.
Festuca hallii - Nassella viridula grassland	plains rough fescue - green needle grass grassland	S1	NNR	GNR	Track	steep south facing escarpment slopes. Dry sites with moderately well-drained soils.	*Festuca hallii* dominant and *Stipa viridula* codominant. *Artemisia ludoviciana* is common. *Elymus lanceolatus, Bouteloua gracilis, Geum triflorum, Thermopsis rhombifolia, Comandra umbellata, Opuntia polyacantha, Lithospermum incisum* and *Astragalus spp.* may occur.
Populus tremuloides / Ribes oxyacanhoides - Rosa woodsii forest	aspen / northern gooseberry - common wild rose forest	SU	NNR	GNR	Track	Habitat Information not provided - Likley on lower terrace and upper floodplain sites.	*Populus tremuloides, Ribes oxyacanhoides,* and *Rosa woodsii* all dominant - No further information

Table C-2 Rare Vascular Plants which have Potential to Occur within the Project Area

Plant Name	Listings / Rankings	Habitat+A3A2:C2
**Atriplex powellii* Powell's saltbush	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Imperiled ACIMS: S2 Tracked	Alkaline flats
Marsh Alkali Aster Almutaster pauciflorus	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	Damp alkaline places, alluvial soils, with halophytic vegetation, inland salt marshes, along streams in ravines, ditches, in desert and dry prairie areas, 200–2400 m
Boechera collinsii (Arabis holboellii var. collinsii) Collin's rockcress	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled ACIMS: S1 Tracked	Dry open woods, rocky slopes, prairies
Boechera pendulocarpa (Arabis holboellii var. pendulocarpa) dangle-pod rockcress	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled ACIMS: S1 Tracked	Dry open woods, rocky slopes, prairies
Waterpod Ellisia nyctelea	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	Moist shady woods and streambanks
Elodea bifoliata two-leaved waterweed	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Imperiled ACIMS: S2 Tracked	Sloughs, ponds and lakes; quiet or running water
Eriogonum pauciflorum few-flowered buckwheat, few-flowered umbrellaplant	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled ACIMS: S1 Tracked	Eroded banks and rocky ridges of prairie badlands
Erythranthe geyeri (Mimulus glabratus ssp. fremontii) Geyer's yellow monkeyflower, round-leaved monkeyflower, smooth monkeyflower	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled ACIMS: S1 Tracked	Wet places; often in water and around springs
Clammy Hedge-hyssop Gratiola neglecta	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	Wet, muddy sites; shallow water

Plant Name	Listings / Rankings	Habitat+A3A2:C2
Lobelia spicata pale-spiked lobelia	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled ACIMS: S1 Tracked	Moist meadows on the plains.
Lycopus americanus American Water-horehound	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	wooded springy areas, especially within sand dune or sand plain settings; occasionally along moist riparian channels of rivers
Lysimachia hybrida Lowland Yellow Loosestrife	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	tall shrubbery or woodland at edge of water; shallow wetland edges; typically, with some sandy component
Muhlenbergia asperifolia Alkali Muhly	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	mounds and microfeatures along the edge of strongly alkali wetlands and seepages, including seasonal streams; appears to require a sandy component to the soil as well
Potentilla paradoxa Bushy Cinquefoil	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	gravelly shores of rivers where there is some residual moisture; sandy/rocky slough edges at high water mark
Potentilla plattensis Platte River cinquefoil, low cinquefoil	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Imperiled ACIMS: S2 Tracked	Dry areas; coulees, flats; meadows and hillsides
Ranunculus glaberrimus Sagebrush Buttercup	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	Grassland; meadows, sagebrush desert, ponderosa pine woodland
Rorippa tenerrima Slender Yellowcress	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	small ephemeral wetlands in sand plains as well as seasonal stream channels in sandy habitat
Viola pedatifida Prairie Violet	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC:Vulnerable ACIMS: S3 Tracked	distinct preference for burned areas; lusher sandy grasslands are prefered with some open sandy soil exposed

** Previous observation found within the project area (ACIMS 2017)*

Table C-3 Lichen Species of Concern which have Previously been Observed within the Project Area

Plant Name	Listings / Rankings
**Cetraria arenaria* sand-loving Iceland lichen	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled / Imperiled ACIMS: S1S2
**Mannia fragrans* liverwort	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: N/A ACIMS: SU
**Lecidella carpathica* disk lichen	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Critically Imperiled / Imperiled ACIMS: S1S2
**Rhizoplaca subdiscrepans* rock-posy lichen	Species at Risk Act: N/A Alberta Wildlife Act: N/A COSEWIC: N/A CESCC: Imperiled ACIMS: S2 Tracked

** Previous observation found within the project area (ACIMS 2017)*

Table C-4 Listing of Potential Wildlife in the Project Area

Class	Name	Rankings / Listings	Habitat
Amphibian	Canadian Toad *Anaxyrus hemiiophrys* (*Bufo hemiophrys)*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: Not at Risk CESCC: Vulnerable AB Wild Species: May Be at Risk ACIMS: S3 Tracked	Are usually found within 40 m of a semi-permenant or permanent wetland/waterbody. Breeding sites require stable water levels, with gentle-sloped shore and mud flats.
Amphibian	Northern Leopard Frog *Lithobates pipiens* (*Rana pipiens)*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Threatened COSEWIC: Special Concern CESCC: Imperiled AB Wild Species: At Risk ACIMS: S2S3 Tracked	Breeds in shallow warm semi-permanent or permanent weltands/waterbodies with a mix of open water and emergent vegetation. Avoid bare or heavily grazed habitats, as well as areas of tall dense vegetation. Hibernating ponds are deep permanent well-oxygenated waterbodies (often associated with springs).
Amphibian	Plains Spadefoot *Spea bombifrons*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: Not at Risk CESCC: Vulnerable AB Wild Species: May Be at Risk ACIMS: S3 Tracked	Prefers sandy, gravelly or sandy loam soils in a variety of grassland habitats. Breeds in temporary or seasonal weltands and will tolerate a wide range of vegetative conditions.
Amphibian	Western Tiger Salamander, Barred Tiger Salamander *Ambystoma mavortium*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Non-license Animal COSEWIC: Special Concern CESCC: Apparently Secure AB Wild Species: Secure ACIMS: S4	Prefers habitats of sandy or friable soils, with lots of woody debris/litter and abundance of small mammal burrows, surrounding semi-permanent or permanent wetlands/waterbodies with no predatory fish.
Bird	American Bittern *Botarus lentiginosus*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3S4B Watched	Marshes, swamps, moist meadows, wet alder or willow thickets in areas of dense emergent vegetation.
Bird	American Kestrel *Falco sparverius*	Species At Risk Act: N/A Wildlife Act: Bird of Prey COSEWIC: N/A CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S5B Watched	Often found perching on telephone wires along roadsides, in open country with short vegetation and few trees.
Bird	American White Pelican *Pelecanus erythrorhynchos*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: Not at Risk CESCC: Secure AB Wild Species: Sensitive ACIMS: S2S3B Tracked	Shallow turbid lakes with extensive shallows and good fish population.

Class	Name	Rankings / Listings	Habitat
Bird	Baird's Sparrow *Ammodramus bairdii*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Non-game Animal COSEWIC: Special Concern CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3B Tracked	Ungrazed or lightly grazed native grassland with patches of shrubs.
Bird	Baltimore Oriole*Icterus galbula*	Species At Risk Act: N/AWildlife Act: Non-game AnimalCOSEWIC: N/ACESCC: Apparently SecureAB Wild Species: SensitiveACIMS: S4B	Tall trees in open deciduous forests, often in edge habitat.
Bird	Bank Swallow *Riparia riparia*	Species At Risk Act: Schedule 1 - Threatened Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S4B Watched	Nests in tunnels in vertical sandbanks
Bird	Barn Swallow *Hirundo rustica*	Species At Risk Act: Schedule 1 - Threatened Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3B Watched	Human structures with nearby water sources.
Bird	Black Swift *Cypseloides niger*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: Endangered CESCC: Imperiled AB Wild Species: Undetermined ACIMS: S2B Tracked	Cliff faces, near seepages or behind waterfalls.
Bird	Black-crowned Night-heron *Nycticorax nycticorax*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S2B Tracked	Large bodies of water with dense emergent vegetation.
Bird	Bobolink *Dolichonyx oryzivorus*	Species At Risk Act: Schedule 1 - Threatened Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Imperiled AB Wild Species: Sensitive ACIMS: S2B watched	Open meadows and pastures, or moist areas of tallgrass prairie and hayfields.
Bird	Bullock's Oriole *Icterus bullockii*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Secure ACIMS: SUB Tracked	Fragmented deciduous forests with low tree density; often near water

Class	Name	Rankings / Listings	Habitat
Bird	Burrowing Owl *Athene cunicularia hypugaea*	Species At Risk Act: Schedule 1 - Endangered Wildlife Act: Endangered COSEWIC: Endangered CESCC: Imperiled AB Wild Species: At Risk ACIMS: S2B Tracked	Open level terrain with short vegetation and available burrows.
Bird	Chestnut-collared Longspur*Calcarius ornatus*	Species At Risk Act: Schedule 1 - ThreatenedWildlife Act: Non-game AnimalCOSEWIC: ThreatenedCESCC: VulnerableAB Wild Species: At RiskACIMS: S3S4B Tracked	Moderate to heavily grazed grassland and poor uncultivated fields with sparse growth.
Bird	Common Nighthawk *Chordeiles minor*	Species At Risk Act: Schedule 1 - Threatened Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3S4B Watched	Open areas with little or low-growing vegetation, such as sand dunes, beaches, burns, clearcuts, rocky outcrops, canyons, and grassy plains. Tolerant of human disturbance and can be found living in airfields, mines, along railways, or farmyards.
Bird	Common Yellowthroat *Geothlypis trichas*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Secure AB Wild Species: Sensitive ACIMS: S5B	Open damp bushy areas.
Bird	Eastern Kingbird *Tyrannus tyrannus*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S4S5B	Open habitats such as yards, fields, pastures, grasslands, or wetlands, and are especially abundant in open places along forest edges or water.
Bird	Ferruginous Hawk *Buteo regalis*	Species At Risk Act: Schedule 1 - Threatened (also listed as Schedule 3 - Special Concern) Wildlife Act: Endangered COSEWIC: Threatened CESCC: Imperiled AB Wild Species: At Risk ACIMS: S2S3B Tracked	Open native grasslands.
Bird	Great Blue Heron *Ardea herodias*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3B Watched	Nests in woodlands near open lakes, streams, rivers, and marshes.

Class	Name	Rankings / Listings	Habitat
Bird	Horned Grebe *Podiceps auritus*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Non-game Animal COSEWIC: Special Concern CESCC: Secure AB Wild Species: Sensitive ACIMS: S3B Watched	Ponds, sloughs, and lakes with extensive marshy vegetation.
Bird	Horned Lark *Eremophila alpestris*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Secure ACIMS: S3S4B, S2N	Open areas of grassland, savannah, and deciduous forests.
Bird	Least Flycatcher*Empidonax minimus*	Species At Risk Act: N/AWildlife Act: Non-game AnimalCOSEWIC: N/ACESCC: Apparently SecureAB Wild Species: SensitiveACIMS: S5B Watched	Open deciduous or mixed woods, especially near edges or openings.
Bird	Loggerhead Shrike *Lanius ludovicianus*	Species At Risk Act: Schedule 1 - Threatened Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3B Tracked	Lightly wooded river valleys and coulees.
Bird	Long-billed Curlew *Numenius americanus*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Non-game Animal COSEWIC: Special Concern CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S3B Tracked	Large areas of open short-grass prairie.
Bird	McCown's Longspur *Rhynchophanes mccownii (Calcarius mccownii)*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Vulnerable AB Wild Species: May Be at Risk ACIMS: S3S4B Tracked	Short-grass prairie, moderately to heavily grazed.
Bird	Pied-billed Grebe *Podilymbus podiceps*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S4B Watched	Pond, wetland or sloughs with dense emergent vegetation.

Class	Name	Rankings / Listings	Habitat
Bird	Prairie Falcon *Falco mexicanus*	Species At Risk Act: N/A Wildlife Act: Bird of Prey COSEWIC: Not at Risk CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3 Watched	Nests in clay, limestone, rock, or sandstone cliffs and outcrops with overhangs (particularly along rivers and streams) in a range of habitats, including grassland, canyons, cultivation, foothills, and mountain valleys. Nearby foraging habitat (open prairie with low vegetation) is essential.
Bird	Red Knot *Calidris canutus rufa*	Species At Risk Act: Schedule 1 - Endangered Wildlife Act: Non-game Animal COSEWIC: Endangered CESCC: Unrankable AB Wild Species: May Be at Risk ACIMS: SUM Tracked	Migrates through Alberta in the south/central-east on sand or mud flats.
Bird	Sharp-tailed Grouse *Tympanuchus phasianelllus*	Species At Risk Act: N/A Wildlife Act: Upland Game Bird COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3S4 Watched	Relatively dry open grassland with dense tall grasses and a patchwork of tree and shrub cover.
Bird	Short-eared Owl *Asio flammeus*	Species At Risk Act: Schedule 1 - Special Concern (also listed as Schedule 3 - Special Concern)Wildlife Act: Bird of PreyCOSEWIC: Special ConcernCESCC: VulnerableAB Wild Species: May Be at RiskACIMS: S3B Tracked	Nests in upland sites with short vegetation. Forages in open areas with abundant small mammal populations. Prey availability appears to be more important to site selection than habitat.
Bird	Sora *Porzana carolina*	Species At Risk Act: N/A Wildlife Act: Migratory Game Bird COSEWIC: N/A CESCC: Secure AB Wild Species: Sensitive ACIMS: S5B	Variety of wetland habitats.
Bird	Sprague's Pipit *Anthus spragueii*	Species At Risk Act: Schedule 1 - Threatened Wildlife Act: Non-game Animal COSEWIC: Threatened CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3S4B Tracked	Bushy grassland, dry lake beds, and moderately grazed pastures.
Mammal	American Badger *Taxidea taxus*	Species At Risk Act: Schedule 1 - Special Concern Wildlife Act: Fur-bearing Animal COSEWIC: Special Concern CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S4	Open areas.

Class	Name	Rankings / Listings	Habitat
Mammal	Eastern red bat *Lasiurus borealis*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3B Tracked	Open grassy areas of dense coniferous and deciduous forests. Hibernates in trees or under thick leaf litter.
Mammal	Hoary Bat *Lasiurus cinereus*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Secure ACIMS: S3B Tracked	Near open areas of coniferous and deciduous forests.
Mammal	Little Brown Bat *Myotis lucifugus*	Species At Risk Act: Schedule 1 - Endangered Wildlife Act: Non-license Animal COSEWIC: Endangered CESCC: Vulnerable AB Wild Species: May Be at Risk ACIMS: S3S4 Watched	Open areas in virtually every habitat type
Mammal	Long-eared Bat *Myotis evotis*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Secure ACIMS: S3S4 Watched	Rocky outcrops and rock crevices, along river valleys, coulees, and steep cliffs.
Mammal	Long-tailed Weasel *Mustela frenata*	Species At Risk Act: N/AWildlife Act: Fur-bearing AnimalCOSEWIC: Not at RiskCESCC: VulnerableAB Wild Species: May Be at RiskACIMS: S3S4 Watched	Open areas in agricultural lands, grassy slopes, alpine tundra.
Mammal	Northern Grasshopper Mouse *Onychomys leucogaster*	Species At Risk Act: N/A Wildlife Act: Non-licence Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Secure ACIMS: S3	Shortgrass prairie and aspen bluffs.
Mammal	Silver-haired Bat *Lasionycteris noctivagans*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Vulnerable AB Wild Species: Sensitive ACIMS: S3S4 Watched	Roosts in woodpecker holes and behind loose bark.
Reptile	Plains Garter Snake, Western Garter Snake *Thamnophis radix*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S4 Watched	Found in highly variable habitat from wet to dry conditions, but not found in heavily wooded areas.

Class	Name	Rankings / Listings	Habitat
Reptile	Wandering Garter Snake, Western Terrestrial Garter Snake *Thamnophis elegans*	Species At Risk Act: N/A Wildlife Act: Non-game Animal COSEWIC: N/A CESCC: Apparently Secure AB Wild Species: Sensitive ACIMS: S4 Watched	Often found close to water, usually along the margins of waterbodies and their associated uplands.