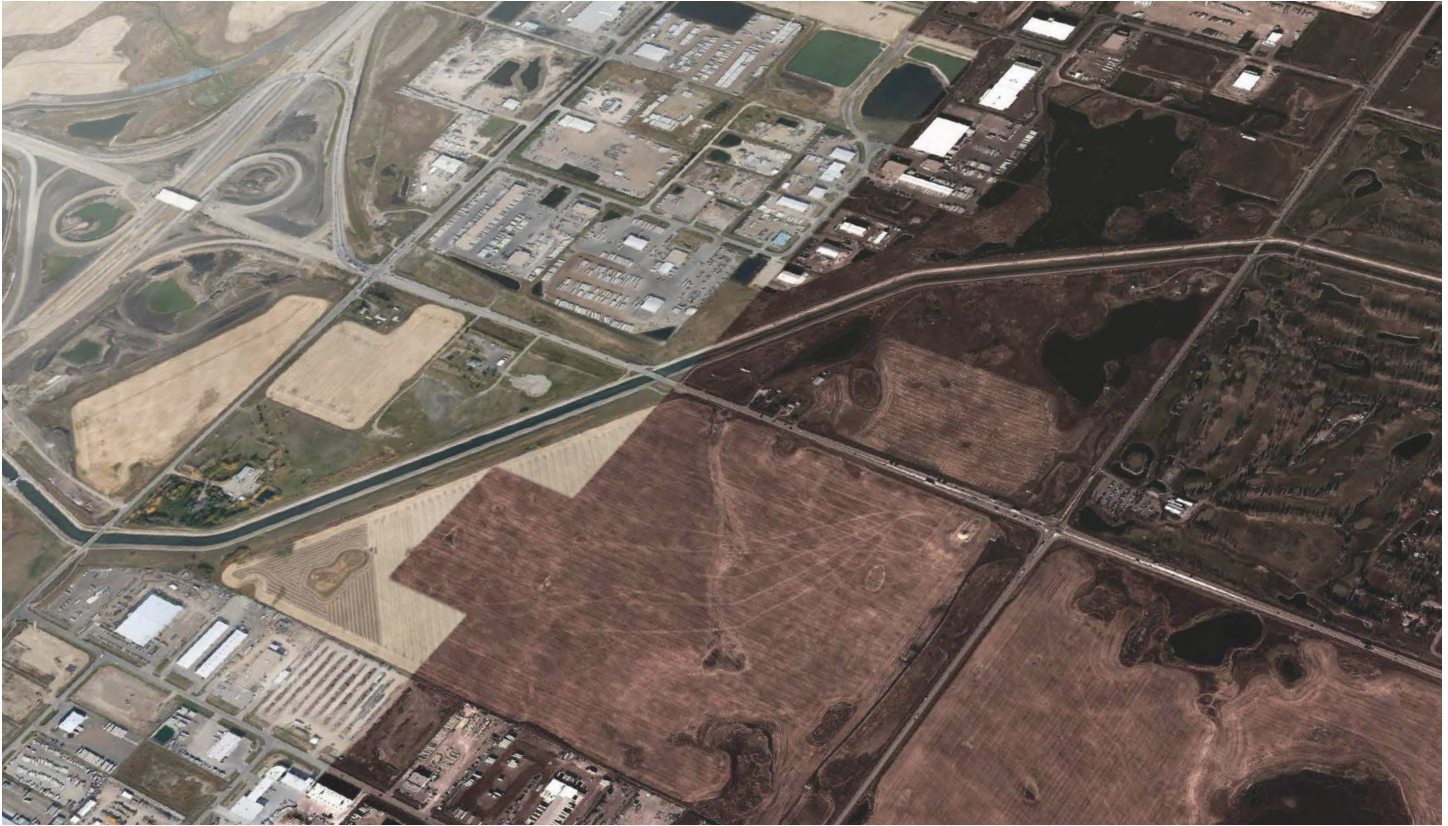


Calgary



Glenmore Trail East Interchanges Functional Planning Study

Appendix C - Environmental Screening Assessment

Prepared By:

PARSONS

ISL

**Engineering
and Land Services**

ECOLOGICAL SCREENING ASSESSMENT

in support of the

Transportation Functional Planning Report - Glenmore Trail East Expansion

Prepared for:

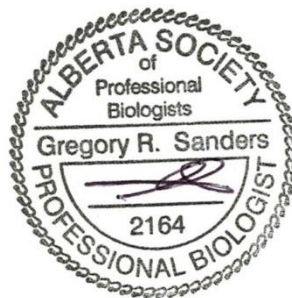
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1.0 Project Overview

Omnia Ecological Services (Omnia) was retained by Parsons Corporation (Parsons) to complete an ecological screening assessment in support of a Transportation Functional Planning Study for the expansion of Glenmore Trail and development of two interchanges. This report provides a review of the terrestrial resources (wildlife, soils and vegetation) and builds upon previous work completed by Parsons in 2015 (Hamilton 2015). Specifically, the proposed project will widen Glenmore Trail from the Stony Trail interchange to Rainbow Road and will add interchanges at 100 St SE and Range Road 284.

The Study area consists of an approximated proposed working footprint and a buffer sized to encompass potential impacts and support an ecological screening of the project (Figure 1). The Alberta Transportation terms of reference for environmental evaluation of highway infrastructure projects (2014) was utilized for guidance.

2.0 Approach and Study Area Characterization

This ecological screening is intended to provide a coarse level characterization of the proposed Glenmore Trail East Expansion project area to facilitate functional planning. The screening identifies potential environmental constraints which can be used to scope future assessments, and mitigation measures to minimize project effects.

A site visit was used to confirm the presence of wetlands, habitat conditions and to gauge the current level of anthropogenic land conversion in the area. Access to project land was not fully available at this time and as such this assessment relied on cursory surveys of the area, work previously completed in the area (Hamilton 2015), as well as, several publically available mapping layers and databases to assist in characterizing the current ecological conditions of the proposed development area.

The following inventory, assessment and planning information sources were obtained and reviewed in order to assist in describing the local and regional ecological conditions of the subject lands:

- Alberta Conservation Information Management System list of tracked and watched elements (ACIMS 2017)
- Alberta Conservation Information Management System's Ecological Community Tracking List (ACIMS 2017)
- Range plant communities and range health assessment guidelines for the Foothills Fescue Subregion of Alberta (Adams *et al.* 2003)

- Fish and Wildlife Management Information System elements of occurrence database (FWMIS 2017)
- Landscape Analysis Tool (LAT – AEP 2017)
- Natural Regions and Subregions of Alberta (Natural Regions Committee 2006)
- Ecodistricts of Alberta – Summary of Biophysical Attributes (Strong and Thompson 1995)
- Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta (GOA 2011)
- Environmental Sensitive Area Mapping 2014 (Fiera 2014)
- Soil survey of the Calgary urban perimeter (MacMillan 1987)
- Rocky View County Wetland Mapping (2005)
- Native Prairie Vegetation Inventory (AESRD 2012)
- Alberta Biodiversity Monitoring Institute (ABMI) Mapping, Data and Analytics Portal (2017)

3.0 Ecological Setting, Soils and Landforms

The Glenmore Trail East Expansion falls within the Foothills Fescue Subregion of the Grassland Natural Region (Natural Regions Committee 2006, Adams *et al.* 2003). This ecological zone occurs as a narrow band between the Mixedgrass Subregion and the Foothills Parkland Subregion. Topography is subdued and characterized by morainal, glaciolacustrine and outwash surficial deposits along the lower flanks of the Foothills Geologic Belt. In native conditions Foothills Fescue vegetation is dominated by grasslands including Rough Fescue (*Festuca scabrella*), Idaho Fescue (*Festuca idahoensis*), Parry’s Oatgrass (*Danthonia parry*) and Intermediate Oatgrass (*Danthonia intermedia*) (Adams et al. 2003). According to mapping by Strong and Thompson (1995), the entire study area occurs within the Delacour Ecodistrict. This Ecodistrict is characterized by:

70% grassland (includes cultivated and pasture) vegetation on undulating (0% to 0.5%) morainal plain with moderately well drained, loam-textured black chernozem soils

20% grassland (includes cultivated and pasture) on undulating (0.5% to 2.5%) morainal plain with moderately well drained, silty loam-textured black chernozem soils

10% grassland (includes cultivated and pasture) vegetation on rolling (6.0% to 9.0%), morainal deposits with well drained, sandy loam-textured dark brown chernozem soils.

As of the mid-1990s approximately 90% of the Delacour Ecodistrict had been cleared for agriculture (Strong and Thompson 1995). Adams *et al.* (2003) reported that as of the early

2000's 16.8% of the original grassland area of the Foothills Fescue subregion remained intact with most of this area occurring south of Nanton.

The Soil Survey of the Calgary Urban Perimeter (MacMillain 1987) was used to determine the soil landscape(s) within the study area (Figure 2). Two soil series, the Balzac and Delacour were detected, with the Delacour accounting for approximately 92% of the study area. The Delacour consists of orthic black chernozem, while the Balzac is a rego humic gleysol soil. The slopes in the study area ranged from 0.5 to 9 percent, with the majority falling within a range of 2 to 5 percent. A detailed description of the soil series can be found in Table 1.

4.0 Methods

4.1 Vegetation

The vegetation component includes four aspects: broad land cover type, biodiversity, potential rare plant and rare plant communities and environmentally significant areas occurrence (ESA).

Broad Land Cover Types

Broad land cover types were identified using the Alberta Biodiversity Monitoring Institute (ABMI) land cover data set (2010). Land cover classes were overlaid onto the project area (Figure 3) and total cover of each land cover type calculated.

To confirm if the land cover types mapped by the ABMI in 2010 are still appropriate (no major land use changes) ortho-photography, previous reports (Hamilton 2015) and a site visit were reviewed/completed.

In addition, Native Prairie Vegetation Inventory Polygons (NPVI) (AESRD 2012) were used to describe, quantify and map the overall native integrity of the project area.

Biodiversity

Alberta Biodiversity Monitoring Institute data assessing the intactness of all 1km² grid cells intersecting the study area was used to describe the relative abundance of species in the landbase. Intactness is defined as a predictive measure of species abundance in the landbase based on human footprint analysis. The landbase being assessed is compared to a reference landbase with no human footprint (ABMI 2016).

Rare Plants and Rare Ecological Communities

The methodology for assessing the potential occurrence of rare plant species and rare ecological communities followed that of the previous biophysical inventory (Hamilton 2015) completed for

the Glenmore Trail East Expansion. This screening serves to update the previous assessment and was expanded to encompass the larger study area.

The list of rare plants and ecological communities was derived from vascular plant species and rare ecological communities with potential to occur within the Foothills Fescue Natural Subregion. In addition, a search of the Alberta Conservation Information System (ACMIS) for element occurrences within the study area was completed.

A rank is assigned to each rare plant in Alberta based on the status codes described below, at the sub-national Status level. The sub-national status rank (SRank) definitions were adapted from those used by NatureServe because in many instances the only available information upon which to base a rank assessment is the number of occurrences (Kemper 2009). Rank definitions are listed below:

SX: Taxon is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH: Known from only historical records but still some hope of rediscovery. There is evidence that the taxon may no longer be present, but not enough to state this with certainty.

S1: Known from five or fewer occurrences, or especially vulnerable to extirpation because of other factor(s).

S2: Known from twenty or fewer occurrences, or vulnerable to extirpation because of other factors.

S3: Known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes, or other factors.

S4: Apparently Secure – taxon is uncommon but not rare; potentially some cause for long term concern due to declines or other factors.

S5: Secure – taxon is common, widespread, and abundant.

Variant Sub-national Conservation Status Ranks are described below:

S#S#: A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the taxon. Ranges cannot skip more than two ranks (e.g., SU is used rather than S1S4).

SU: Taxon is currently not rankable due to lack of information or due to substantially conflicting information (e.g., native vs. non-native status not resolved).

SNR: Not ranked - conservation status not yet assessed.

SNA: Not Applicable – A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., introduced species).

Environmentally Significant Areas

Environmentally significant areas are defined as “areas that are important to the long-term maintenance of biological diversity, physical landscape features and/or other natural processes, both locally and within a larger spatial context” (Fiera 2014). Environmentally significant areas (ESA) mapping by Fiera (2014) was reviewed to assess the potential occurrences of ESA’s within/adjacent to the project area.

4.2 Wetlands

Wetlands mapping completed by Rocky View Country (2005) was overlaid onto the project area (Figure 4) and a summary of the number, type and calculation of size (ha) was completed. Wetlands were classified into one of four classes as follows:

- Wetland (Emergent Vegetation) – Hydrophytic vegetation occupying wetland basin
- Wetland (Open Water) – Open water within an intact wetland basin or open water zone in dry basin
- Wetland (Cropped Basin) – Cultivated depression or wetland margin defined by topography and the presence of water or recent evidence of flooding, includes digressional areas altered by agricultural activities.
- Dugouts – Man made waterbodies

A cross-reference between Rocky View (2005) wetland classification and the new Alberta Wetland Classification System (AESRD 2015) was completed. In addition, Google Earth Pro ortho-photography was reviewed to identify potential occurrence of semi-permanent and/or permanent wetlands in the study area.

4.3 Wildlife

The wildlife assessment focused on the potential for occurrence of species at risk in the study area. Status and abundance rankings were provided for each species with potential to occur. Species at risk were defined as those species which are listed provincially (AEP 2015) or federally (COSEWIC 2017, SARA 2017). To determine the potential for occurrence of wildlife species in the study area a combination of the author’s experience, local and provincial references (Federation of Alberta Naturalists 2007, Fisher *et al.* 2007, Russell and Bauer 2000, Smith 1993, Pattie and Fisher 1999, Fisher and Acorn 1998), previous ecological reports in the region (Hamilton 2015), and searches of the following databases were completed:

- FWMIS - Fish and Wildlife Management Information System elements of occurrence database
- LAT – Landscape Analysis Tool

Status and abundance definitions are listed below and at risk definitions provided in Table 2.

Status

S – summer resident, migrates out of study area for the winter

W – winter resident, present only during late fall, winter and early spring

R – permanent resident, present year-round although not necessarily active during winter

M – migrant, passes through area during spring and/or fall, not normally resident at any time of the year

T – transient, expected to occur only in passing, not normally resident at any time of the year

Abundance

C – common, detected whenever suitable habitat is investigated during an appropriate season

U – uncommon, detected often, but not always, whenever suitable habitat is investigated during an appropriate season

S – scarce, detected occasionally, but not usually, even when suitable habitat is investigated during an appropriate season

R – rare, unexpected but could occur in any given year, would not generally be considered a regular component of the study area fauna

5.0 Results

5.1 Vegetation

Broad Land Cover Types

A total of four land cover classes were identified in the study area using ABMI's 2010 land cover data set (Figure 3). The four class included water, developed land, grassland, and agriculture (Table 3). Agricultural and developed land cover types covered approximately 88 percent of the study area, 55 percent and 33 percent respectively. Wetlands and grassland land

cover types accounted for 7 percent and 5 percent of the cover. A site visit was completed to assess the current state of the study area and to confirm the ABMI land cover data set was still accurate. The site visit confirmed that the study area was predominately a mix of agriculture and developed lands, with wetlands scattered throughout. Developed lands (anthropogenic) cover types included roadways, powerlines, estate properties, and a golf course. Agricultural land cover types included non-irrigated tilled/planted crops, a tree farm and hay/grazing pasture land. Wetlands of various classes were observed in the study area during the site visit. No native grasslands were observed during the field visit.

An assessment of native habitats in and around the study area was completed using Alberta Environment and Sustainable Resource Development's native prairie inventory data set (2012). The resulting assessment analyzed nine quarter sections with a least a portion that occurs within the study area. Three quarter sections had no native habitat, five had 1-25 percent and one quarter section had 51-75 percent. Quarter section SE-30-23-28-W4 had the highest proportion of native habitat, with the majority attributed to wetlands.

Biodiversity

A total of seven grid cells were utilized from the ABMI data and analytics portal to assess the intactness of the Glenmore Trail East Expansion study area and region. The average result for all species was 53 and mammals exclusively scored 69. The results are a representation of a scale of 0 to 100 with the resultant number representing the percentage of abundance expected in the reference landbase with no footprint.

Rare Plant and Rare Ecological Communities

A total of 16 rare plants and one rare plant community were determined to have the potential to occur within the study area (Table 4).

Environmentally Significant Areas

A screening of the quarter sections which overlap with the study area, yielded one quarter section (SE-30-23-28-W4) with environmentally significant areas. The quarter section had elements of criterion 1, areas that contain focal species, species groups or their habitats, criterion 3, areas with ecological integrity, and criterion 4, areas that contribute to water quality and quantity (Fiera 2014). Due to the coarse nature of this data (by quarter section) it cannot be confirmed whether this area overlaps specifically within the proposed footprint; however the native prairie inventory data set (2012) indicated the highest proportion of native habitat in this quarter section and ABMI mapping (2010) indicated grassland and water land cover types within the study area for this quarter section. The potential for environmentally significant areas within the study area should be addressed by future more detailed assessments.

5.2 Wetlands

A total of 56 wetlands covering approximately 8% of the study area occur within or overlap with the study area (Figure 4). Table 5 details the number of wetlands, total area, Rocky View (2005) classification and desktop determination of Alberta wetland policy classification. A preliminary assessment of wetlands in the study area, using time-lapse Google Earth Pro, indicates the continued presence of at least two wetlands across 11 years spanning from 2002-2017. In addition, a field visit confirmed the presence of these two wetlands as of June 28, 2017. These findings indicate the strong likelihood of at least two permanent wetlands with potential to be impacted by the project. However, a formal permanence assessment, per the Alberta Wetland Policy, will be required to classify and assess permanence of other semi-permanent and seasonal wetlands.

5.3 Wildlife

A total of 45 wildlife species at risk were identified as having potential to occur in the study area (Table 6). Seventeen had been observed in and around the study area historically, according to FWMIS search results. In addition, during the site visit conducted June 28, 2017 five species at risk were observed (Appendix A).

The results of the LAT report indicated the occurrence of sensitive raptor range, sharp-tailed grouse range, the grassland and parkland natural region and other sensitive and endangered species range (short-eared owl, mountain plover etc.).

6.0 Recommendations

6.1 Vegetation

There is a strong potential for the occurrence of some patches of native upland habitat within the study area based on this review. As a result, there is potential for rare plants and rare plant communities to occur within the study area. Consequently, we recommend that:

- Early and late season rare plant/rare ecological community surveys be completed
- In conjunction, vegetation cover mapping should be completed to facilitate:
 - Composition and structural vegetation assessments
 - Disturbance/native habitat integrity assessments

6.2 Wetlands

There are a large number of wetlands located within the study area and many are likely to be impacted by the project. Preliminary assessment indicates that some of these wetlands area likely to be permanent. Should any wetlands be impacted or encroached upon, a wetland assessment impact report will be required. It is likely, given the presence and location of semi-permanent

and/or permanent wetlands, that a wetland permanence assessment will also be required. The steps to complete these assessments are as follows:

- Desktop delineation and classification of wetlands using historical aerial photographs and precipitation records
- Depending upon the timing of the application, updated desktop database searches will need completion for wildlife species at risk, rare plants and potential constraints
- Field surveys for rare plants, rare plant communities and wildlife species at risk
- ABWRET field survey and submission
- Wetland permanence assessment

6.3 Wildlife

We recommend that wildlife species at risk surveys be completed as a result of the number of the wetlands on the property, the potential/observed species at risk in the study area and the intersection of several sensitive species ranges as identified in the LAT report. Several species with potential to occur in the study area have a recommended setback on nesting/breeding sites; therefore it is important to identify any constraints. Recommended surveys include:

- Amphibian nocturnal call surveys
- Breeding songbird surveys
- Sharp-tailed grouse lek surveys
- Stick nest searches
- Burrowing owl habitat suitability surveys (call-playback survey dependent on habitat availability)

In addition to the aforementioned surveys, pre-disturbance surveys will be required depending upon the timing of any ground disturbance. In order to comply with the Migratory Birds Convention Act (MBCA), we recommended that clearing activity be limited to dates outside of the peak breeding and nesting season (May 1 and August 20 in upland areas and April 15 and August 20 in wetlands). If land clearing must be completed within the restricted activity periods, then a nest search needs to be completed prior to clearing. If an active or indicated nest is found, an appropriate buffer must be applied and it cannot be disturbed until vacated.

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7.0 Tables

Table 1. Soil Attributes in the Glenmore Trail East Expansion Study Area.

Map Symbol (Figure 2)	Soil Group	Soil Unit	Hectares	Slope %	Great Group-Subgroup	Parent Material and Landform	Composition and Drainage
BZC2/bd	Balzac	BZC2	2.89	0.5-9	Rego Humic Gleysol	Fine clayey recent lacustrine; till or coarse loamy veneer overlying till at unit margins. Level to inclined.	Poorly drained Humic Gleysols. Mapped in sinuous drainage channels. Soils at margins are better drained and may be solonetzic. Usually developed till but may be somewhat sandy.
BZC3/b	Balzac	BZC3	8.90	0.5-2.5	Rego Humic Gleysol	Fine clayey recent lacustrine; overlying till. Level to undulating.	Poorly drained saline Humic Gleysols with better drained Black Chernozemics.
BZC4/bc	Balzac	BZC4	0.70	0.5-5	Rego Humic Gleysol	Thin discontinuous, fine clayey recent lacustrine; overlying till. Undulating to depressional.	Variable mixture of poorly drained saline Humic Gleysols with well drained Black Chernozemics and well to imperfectly drained Solodized Solonetz. Mapped in low lying areas of groundwater discharge areas with minor better drained knolls.
DEL1/c	Delacour	DEL1	108.98	2-5	Orthic Black Chernozem	Fine loamy till. Level to gently rolling.	Well drained Black Chernozems. Isolated patches of surface salts may occur.
DEL1/d	Delacour	DEL1	22.74	6-9	Orthic Black Chernozem	Fine loamy till. Level to gently rolling.	Well drained Black Chernozems. Isolated patches of surface salts may occur.
DEL2/c	Delacour	DEL2	1.47	2-5	Orthic Black Chernozem	Fine loamy till. Low-lying, undulating to hummocky.	Well drained Black Chernozems with poorly drained saline Humic Gleysols in scattered wet depressions. Isolated surface salt patches.
DEL3/c	Delacour	DEL3	9.39	2-5	Orthic Black Chernozem	Fine loamy till. Low-lying, undulating to hummocky.	Well drained Black Chernozems with numerous poorly drained saline Humic Gleysols in scattered wet depressions. Isolated surface salt patches.

Source: Soil Survey of the Calgary Urban Perimeter (MacMillian 1987)

Table 2. At Risk Definitions. (AEP 2010, AEP 2000, COSEWIC 2017).

	Alberta Environment and Parks
At Risk	Any species known to be “At Risk” after formal detailed status assessment and legal designation as “Endangered” or “Threatened” in Alberta.
May Be At Risk	Any species that “May Be At Risk” of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
Sensitive	Any species that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.
Secure	A species that is not “At Risk,” “May Be At Risk” or “Sensitive.”
Undetermined	Any species for which insufficient information, knowledge or data is available to reliably evaluate its general status.
Not Assessed	Any species that has not been examined during this exercise.
Exotic/Allen	Any species that has been introduced as a result of human activities.
Extirpated/ Extinct	Any species no longer thought to be present in Alberta (“Extirpated”) or no longer believed to be present anywhere in the world (“Extinct”).
Accidental/ Vagrant	Any species occurring infrequently and unpredictably in Alberta, i.e., outside its usual range. (These species may be in Alberta due to unusual weather occurrences, an accident during migration, or unusual breeding behaviour by a small number of individuals. If a species appears in Alberta with increasing predictability and more frequently, it may eventually be given a different rank. Changes in “Accidental/Vagrant” species may be a good indicator of general ecosystem or climatic changes.)
	Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
Endangered	A wildlife species facing imminent extirpation or extinction
Threatened	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Not at Risk	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Table 3. ABMI Land Cover Classes in the Glenmore East Expansion Study Area.

Map ID	Land Cover Class	Hectares	Percentage of Study Area
20	Water	10.63	6.85
34	Developed	51.47	33.19
110	Grassland	7.83	5.05
120	Agriculture	85.15	54.91

Table 4. Rare plant Species and Rare Ecological Communities with potential to occur in the Glenmore Trail East Expansion Study Area.

Scientific Name	Common Name	S Rank	G Rank
<i>Agrostis exarata</i>	Spike Redtop	S3	G5
<i>Carex vesicaria</i>	Blister Sedge	S1	G5
<i>Elodea bifoliata</i>	Two-Leaved Waterweed	S2	G4G5
<i>Gratiola neglecta</i>	Clammy hedge-hyssop	S3	G5
<i>Lomatogonium rotatum</i>	Marsh Felwort	S3	G5
<i>Muhlenbergia racemose</i>	Marsh Muhly	S3	G5
<i>Polanisia dodecandra</i>	Clammyweed	S3	G5
<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed	S3	G5
<i>Rorippa curvipes</i>	Blunt-leaved Water Cress	S3	G5
<i>Rorippa tenerrima</i>	Slender Cress	S3	G5
<i>Ruppia cirrhosa</i>	Widgeon-grass	S3	G5
<i>Sisyrinchium septentrionale</i>	Pale Blue-eyed Grass	S4	G3G4
<i>Spartina pectinate</i>	Prairie Cord Grass	S2	G5
<i>Sphenopholis obtusata</i>	Prairie Wedge Grass	S3	G5
<i>Symphyotrichum campestre</i>	Meadow Aster	S3	G5
<i>Symphyotrichum eatonii</i>	Eaton's Aster	S3	G5
<i>Salicornia rubra emergent marsh</i>	Samphire Emergent Marsh	S2	GNR

Source: ACMIS 2017, Hamilton 2015

Table 5. Wetland distribution and composition in the Glenmore Trail East Expansion study area.

Rocky View County Wetland Classification	Likely Alberta Wetland Policy Classification	Number	Hectares In Study Area	Total Hectares	% of Total Study Area
Dugout	-	9	1.32	1.33	0.85
Wetland - cropped basin	-Ephemeral -Temporary -Seasonal -Semi-permanent	19	1.75	1.82	1.13
Wetland - emergent vegetation	-Seasonal -Semi-Permanent -Permanent	25	4.82	9.45	3.11
Wetland - open water	Semi-Permanent- Permanent	3	4.46	5.78	2.88

Table 6. Vertebrate species at risk with potential for residency in the Glenmore Trail East Expansion study area.

Common Name	Scientific Name	Status	Abundance	At Risk Designations			
				Alberta	COSEWIC	Schedule	SARA
Amphibians							
Northern leopard frog	<i>Lithobates pipiens</i>	R	S	At Risk	Special Concern	Schedule 1	Special Concern
Canadian Toad	<i>Bufo hemiophrys</i>	R	S	May be at Risk	Not at Risk	-	-
Western Toad	<i>Anaxyrus boreas</i>	R	S	Sensitive	Special Concern	Schedule 1	Special Concern
Reptiles							
Wandering Garter Snake	<i>Thamnophis elegans</i>	R	U	Sensitive	-	-	-
Plains Gartersnake	<i>Thamnophis radix</i>	R	U	Sensitive	-	-	-
Red-sided Garter Snake	<i>Thamnophis sirtalis</i>	R	U	Sensitive	-	-	-
Mammals							
Long-tailed Weasel	<i>Mustela frenata</i>	R	U	May be at Risk	-	-	-
American Badger	<i>Taxidea taxus</i>	R	S	Sensitive	-	-	-
Birds							
Northern Pintail	<i>Anas acuta</i>	S	U	Sensitive	-	-	-
American Greenwinged Teal	<i>Anas crecca</i>	S	U	Sensitive	-	-	-
Lesser Scaup	<i>Aythya affinis</i>	S	U	Sensitive	-	-	-
Western Grebe	<i>Aechmophorus occidentalis</i>	S	S	At Risk	Special Concern	-	-
Sora	<i>Porzana carolina</i>	S	U	Sensitive	-	-	-
Black Tern	<i>Chlidonias niger</i>	S	U	Sensitive	Not at Risk	-	-
Black-Necked Stilt	<i>Himantopus mexicanus</i>	S	S	Sensitive	-	-	-
Great Blue Heron	<i>Ardea Herodias</i>	S	U	Sensitive	-	-	-

Table 6. cont. Vertebrate species at risk with potential for residency in the Glenmore Trail East Expansion study area.

Common Name	Scientific Name	Status	Abundance	At Risk Designations			
				Alberta	COSEWIC	Schedule	SARA
Birds							
Pied-Billed Grebe	<i>Podilymbus podiceps</i>	S	U	Sensitive	-	-	-
Horned Grebe	<i>Podiceps auritus</i>	S	U	Sensitive	Special Concern	Schedule 1	Special Concern
White-Faced Ibis	<i>Plegadis chihi</i>	S	S	Sensitive	-	-	-
Black-Crowned Night Heron	<i>Nycticorax nycticorax</i>	S	U	Sensitive	-	-	-
American Bittern	<i>Botaurus lentiginosus</i>	S	S	Sensitive	-	-	-
Long-Billed Curlew	<i>Numenius americanus</i>	S	S	Sensitive	Special Concern	Schedule 1	Special Concern
Piping Plover	<i>Charadrius melodus</i>	S	S	At Risk	Endangered	Schedule 1	Endangered
Trumpeter Swan	<i>Cygnus buccinator</i>	S	S	Sensitive	Not at Risk	-	-
Forster's Tern	<i>Sterna forsteri</i>	S	U	Sensitive	-	-	-
Yellow Rail	<i>Corturnicops noveboracensis</i>	S	S	Undetermined	Special Concern	Schedule 1	Special Concern
Upland Sandpiper	<i>Bartramia longicauda</i>	S	S	Sensitive	-	-	-
Bobolink	<i>Dolichonyx oryzivorus</i>	S	S	Sensitive	Threatened	-	-
Brewer's Sparrow	<i>Spizella breweri</i>	S	U	Sensitive	-	-	-
Common Yellowthroat	<i>Geothlypis trichas</i>	S	U	Sensitive	-	-	-
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S	U	Sensitive	-	-	-
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S	R	Sensitive	-	-	-
Barn Swallow	<i>Hirundo rustica</i>	S	U	Sensitive	Threatened		
Spargue's Pipit	<i>Anthus spragueii</i>	S	U	Sensitive	Threatened	Schedule 1	Threatened
Eastern Phoebe	<i>Sayomis phoebe</i>	S	U	Sensitive	-	-	-

Table 6. cont. Vertebrate species at risk with potential for residency in the Glenmore Trail East Expansion study area.

Common Name	Scientific Name	Status	Abundance	At Risk Designations			
				Alberta	COSEWIC	Schedule	SARA
Birds							
Least Flycatcher	<i>Empidonax minimus</i>	S	U	Sensitive	-	-	-
Baird's Sparrow	<i>Ammodramus bairdii</i>	S	U	Sensitive	Special Concern	Schedule 1	Special Concern
Sharp-Tailed Grouse	<i>Tympanshus phasianellus</i>	R	U	Sensitive	-	-	-
Burrowing Owl	<i>Athene cunicularia</i>	S	R	At Risk	Endangered	Schedule 1	Endangered
Short-Eared Owl	<i>Asio flammeus</i>	R	S	May be at Risk	Special Concern	Schedule 1	Special Concern
Common Nighthawk	<i>Chordeiles minor</i>	S	U	Sensitive	Threatened	Schedule 1	Threatened
Ferruginous Hawk	<i>Buteo regalis</i>	S	S	At Risk	Threatened	Schedule 1	Threatened
Prairie Falcon	<i>Falco peregrinus</i>	S	S	Sensitive	Not at Risk	-	-
American Kestrel	<i>Falco sparverius</i>	S	U	Sensitive	-	-	-
Osprey	<i>Pandion haliaetus</i>	S	U	Sensitive	-	-	-

8.0 Figures

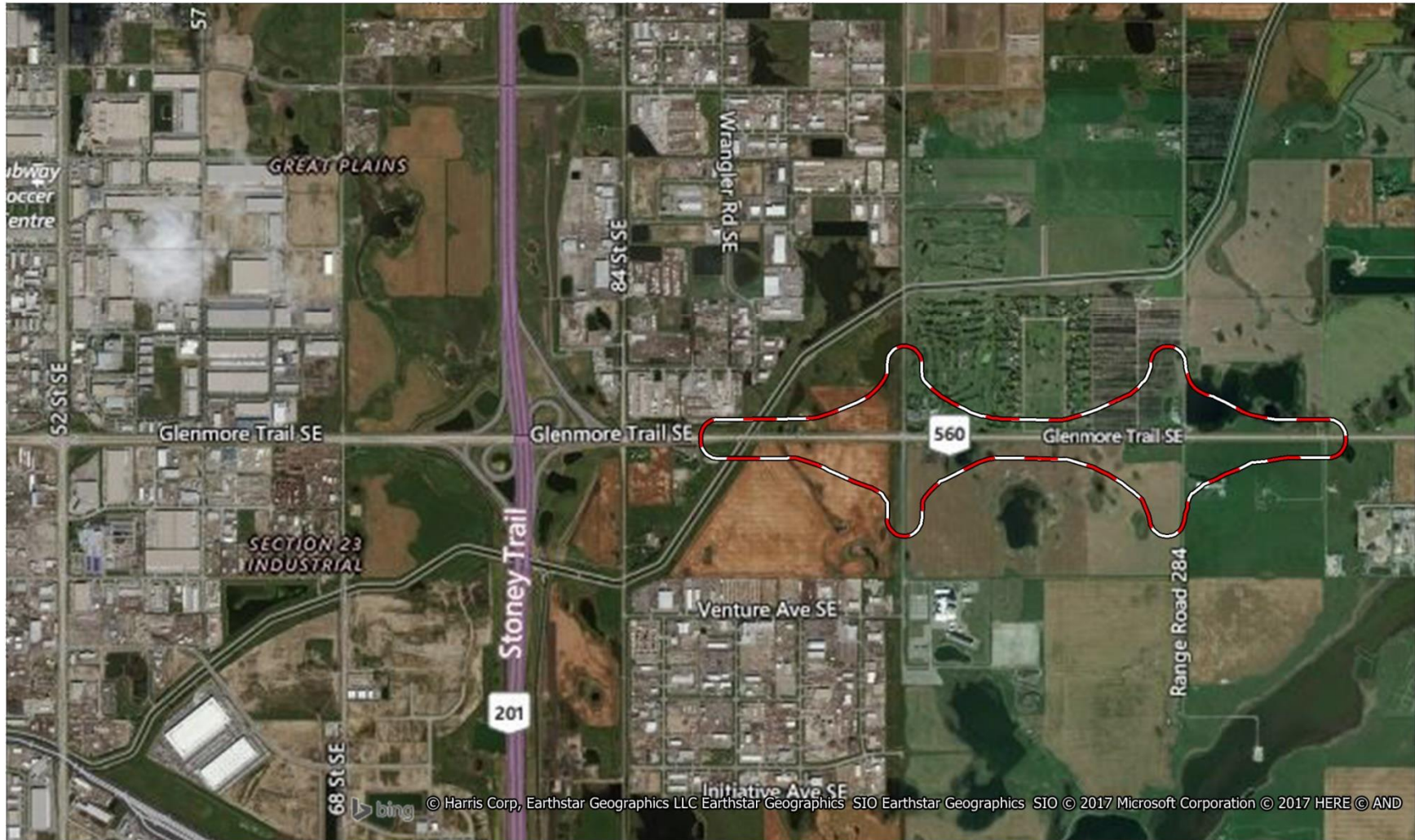


Figure 1. Glenmore Trail East Study Area - Location

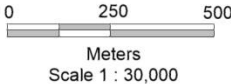


Source: Rocky View County (2005)



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Legend





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Figure 2. Glenmore Trail East Study Area - Soil Types



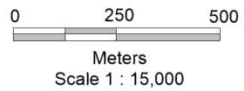
Macmillan, R.A. "Soil Survey of the Calgary Urban Perimeter", Report #45, Terrain Sciences Department, Alberta Research Council: 1987



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- Legend**
-  Soil Series
 -  Study Area

MAP_SYMBOL	SOIL_SERIES	HECTARES	SLOPE_%
BZC2/bd	Balzac	2.89	0.5 - 9 %
BZC3/b	Balzac	8.90	0.5 - 2.5 %
BZC4/bc	Balzac	0.70	0.5 - 5 %
DEL1/c	Delacour	108.98	2 - 5 %
DEL1/d	Delacour	22.74	6 - 9 %
DEL2/c	Delacour	1.47	2 - 5 %
DEL3/c	Delacour	9.39	2 - 5 %





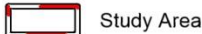
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Figure 3. Glenmore Trail East Study Area - Landcover Types



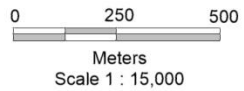
Source: Alberta Biodiversity Monitoring Institute (2010)

Legend



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Landcover Classes			
LC_class	LC_description	Hectares	SA_%
20	Water	10.63	6.85
34	Developed	51.47	33.19
110	Grassland	7.83	5.05
120	Agriculture	85.15	54.91



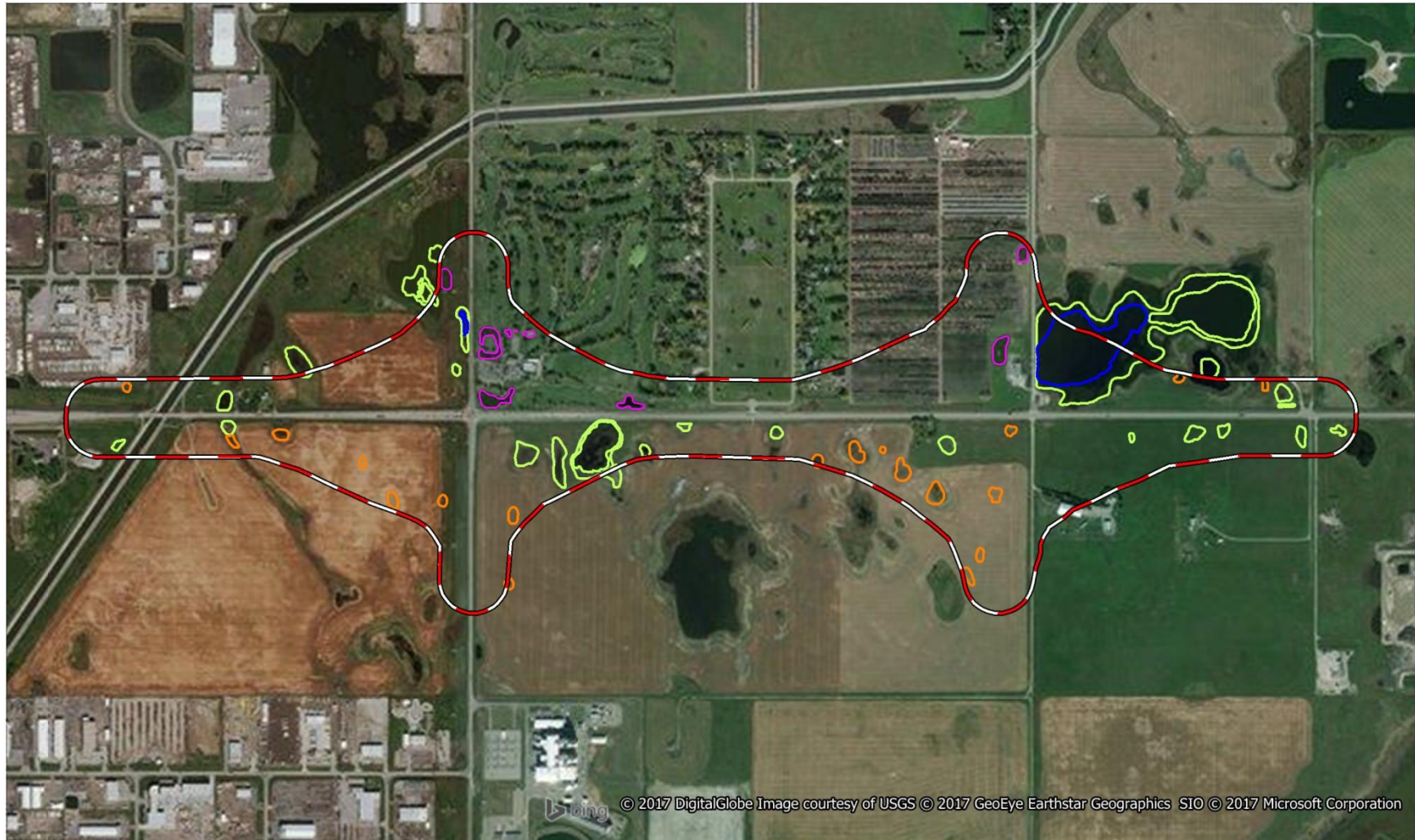


Figure 4. Glenmore Trail East Study Area - Wetland Types



Source: Rocky View County (2005)



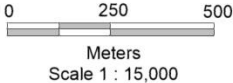
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Legend

- Wetland Classes
- Dugout
 - Wetland - cropped basin
 - Wetland - emergent vegetation
 - Wetland - open water
 - Study Area

Wetland Summary

Classes	Hectares
Dugout	1.32
Wetland - cropped basin	1.75
Wetland - emergent vegetation	4.82
Wetland - open water	4.46



9.0 Appendix A

Table A. Wildlife observations during site visit.

Scientific Name	Common Name	Number Observed
<i>Leucophaeus pipixcan</i>	Franklin's Gull	26
<i>Fulica americana</i>	American Coot	22
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	17
<i>Anas platyrhynchos</i>	Mallard	16
<i>Larus californicus</i>	California Gull	12
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	11
<i>Branta canadensis</i>	Canada Goose	8
<i>Anas discors</i>	Blue Winged Teal	7
<i>Oxyura jamaicensis</i>	Ruddy Duck	6
<i>Anas clypeata</i>	Northern Shoveler	5
<i>Aythya affinis</i>	Lesser Scaup	4
<i>Podiceps nigricollis</i>	Eared Grebe	4
<i>Passerculus sandwichensis</i>	Savannah Sparrow	4
<i>Charadrius vociferus</i>	Killdeer	3
<i>Tringa semipalmata</i>	Willet	2
<i>Corvus brachyrhynchos</i>	American Crow	2
<i>Turdus migratorius</i>	American Robin	2
<i>Spizella pallida</i>	Clay-colored Sparrow	2
<i>Chlidonias niger</i>	Black Tern	2
<i>Tyrannus tyrannus</i>	Eastern Kingbird	1
<i>Pica hudsonia</i>	Black-billed Magpie	1
<i>Himantopus mexicanus</i>	Black-necked Stilt	1
<i>Cygnus buccinator</i>	Trumpeter Swan	1
<i>Canis latrans</i>	Coyote	1
<i>Ondatra zibethicus</i>	Muskrat	1

10.0 Appendix B



Photograph 1. Wetland along Glenmore trail



Photograph 2. Wetland surrounded by agricultural land located at intersection of Glenmore trail and Range Road 284.



Photograph 3. Tree Farm in study area.



Photograph 4. Mix of anthropogenic (power lines) and agricultural grassland land in study area.



Photograph 5. Trumpeter Swan on a wetland in the NE end of study area.