

# ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING

## TABLE OF CONTENTS

	Page
<b>5.0 ENVIRONMENTAL AND SOCI-ECONOMIC SETTING</b>	
<b>5.1 Pipeline</b> .....	<b>1</b>
<b>5.1.1 Physical Environment</b> .....	<b>1</b>
5.1.1.1 Physiography.....	1
5.1.1.2 Geology.....	1
5.1.1.3 Surficial Geology.....	2
5.1.1.4 Climate.....	2
<b>5.1.2 Soil Capability</b> .....	<b>4</b>
5.1.2.1 Soil Characteristics.....	4
<b>5.1.3 Water Quality and Quantity</b> .....	<b>6</b>
5.1.3.1 Surface Water.....	6
5.1.3.2 Water Quality.....	6
5.1.3.3 Groundwater.....	6
<b>5.1.4 Greenhouse Gases and Air Quality</b> .....	<b>7</b>
<b>5.1.5 Acoustic Environment</b> .....	<b>7</b>
<b>5.1.6 Fish and Fish Habitat</b> .....	<b>7</b>
<b>5.1.7 Wetlands</b> .....	<b>8</b>
<b>5.1.8 Vegetation</b> .....	<b>8</b>
5.1.8.1 Ecosystem Classification.....	8
5.1.8.2 Non-native and Invasive Species.....	9
5.1.8.3 Rare Vascular Plants.....	9
<b>5.1.9 Wildlife and Wildlife Habitat</b> .....	<b>10</b>
5.1.9.1 Wildlife Species and Habitat of Concern.....	10
5.1.9.2 Ecosystem Classification.....	12
5.1.9.3 Land Capability.....	12
<b>5.1.10 Species at Risk</b> .....	<b>13</b>
5.1.10.1 Vascular Plant Species at Risk.....	13
5.1.10.2 Wildlife Species at Risk.....	15
<b>5.1.11 Human Occupancy and Resource Use</b> .....	<b>20</b>
5.1.11.1 Population and Demographics.....	20
5.1.11.2 Environmentally Significant and Protected Areas.....	21
5.1.11.3 Natural Resource Use.....	21

5.1.11.4 <i>Surface Dispositions</i> .....	22
<b>5.1.12 <i>Heritage Resources</i></b> .....	<b>22</b>
5.1.12.1 <i>Archaeological Overview</i> .....	22
5.1.12.2 <i>Archaeological Site Potential and Recommendations</i> .....	22
<b>5.1.13 <i>Traditional Land and Resource Use</i></b> .....	<b>22</b>
<b>5.1.14 <i>Social and Cultural Well-being</i></b> .....	<b>22</b>
<b>5.1.15 <i>Human Health</i></b> .....	<b>23</b>
<b>5.1.16 <i>Infrastructure and Services</i></b> .....	<b>23</b>
5.1.16.1 <i>Transportation and Transmission</i> .....	23
5.1.16.2 <i>Waste Management</i> .....	23
<b>5.1.17 <i>Employment and Economy</i></b> .....	<b>24</b>
5.1.17.1 <i>Existing Local and Regional Employment</i> .....	24
5.1.17.2 <i>Local Employment Development Plans</i> .....	25
5.1.17.3 <i>Anticipated Levels of Local and Regional Economic Participation</i> .....	25

**TABLES**

TABLE 5.1	SNOWFALL, RAINFALL AND TEMPERATURE NORMALS FOR THE PROJECT AREA
TABLE 5.2	CANADA LAND INVENTORY CLASSIFICATIONS ALONG THE PROPOSED PIPELINE ROUTE
TABLE 5.3	SOIL PRODUCTIVITY RATINGS ALONG THE PROPOSED PIPELINE ROUTE
TABLE 5.4	WATERBODIES AND DRAINAGES CROSSED BY THE PROPOSED ROUTE
TABLE 5.5	SPRING/SUMMER 2011 PROPOSED VEGETATION RECONNAISSANCE LOCATIONS
TABLE 5.6	RARE PLANT SPECIES RECORDED BY MANITOBA CONSERVATION DATA CENTRE WITHIN 2 KM OF THE PROPOSED PIPELINE ROUTE
TABLE 5.7	SIGNIFICANT MIGRATORY BIRD HABITAT SUBREGIONS TRAVERSED BY THE PROPOSED PIPELINE ROUTE
TABLE 5.8	STATUS OF WILDLIFE SPECIES IDENTIFIED BY MANITOBA CONSERVATION DATA CENTER WITHIN 2 KM OF THE PROPOSED PIPELINE ROUTE
TABLE 5.9	LANDS ALONG THE PROPOSED PIPELINE ROUTE RATED AS HAVING NO SIGNIFICANT (CLASS 1) TO SLIGHT (CLASS 3) LIMITATIONS TO THE PRODUCTION OF UNGULATES
TABLE 5.10	LANDS ALONG THE PROPOSED PIPELINE ROUTE RATED AS HAVING NO SIGNIFICANT (CLASS 1) TO SLIGHT (CLASS 3) LIMITATIONS TO THE PRODUCTION OF WATERFOWL
TABLE 5.11	COMMUNITIES ALONG THE PROPOSED PIPELINE ROUTE
TABLE 5.12	TRANSPORTATION INFRASTRUCTURE CROSSED BY THE PROPOSED PIPELINE ROUTE
TABLE 5.13	WASTE DISPOSAL GROUNDS LOCATED ALONG THE PROPOSED PIPELINE ROUTE

## **APPENDICES**

APPENDIX 5A PHOTOPLATES OF THE PROPOSED PIPELINE ROUTE

APPENDIX 5B RARE PLANT SPECIES AND PLANT COMMUNITIES AND RARE WILDLIFE SPECIES WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

TABLE 5B-1 POTENTIAL RARE VASCULAR PLANT SPECIES IN THE ASPEN PARKLAND ECOREGION OF MANITOBA

TABLE 5B-2 POTENTIAL RARE PLANT COMMUNITIES FOR THE ASPEN PARKLAND ECOREGION TRAVERSED BY THE PROPOSED PROJECT WITHIN MANITOBA

TABLE 5B-3 POTENTIAL RARE WILDLIFE SPECIES IN THE ASPEN PARKLAND ECOREGION TRAVERSED BY THE PROPOSED PIPELINE IN MANITOBA

APPENDIX 5C ARCHAEOLOGICAL OVERVIEW

---

---

## 5.0 ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING

The following subsections describe the environmental setting along the proposed Provident NGL Pipeline route. The information used to determine the current environmental and socio-economic setting along the proposed route was compiled from the following sources:

- existing published literature including topographic maps, aerial photography, scientific papers, reference books as well as municipal, provincial and federal government maps, reports, guides, information letters and databases; and
- personal communications with regulatory agencies, landowners, local stakeholders, local and municipal government and provincial government agencies and the general public.

Methods of obtaining resource material included searching libraries, receiving documents directly from government agencies and using the Internet. All references used in the preparation of the environmental and socio-economic setting of the EA are cited in Section 11.0.

### 5.1 Pipeline

This subsection describes the environmental and socio-economic setting along the proposed pipeline route as described in Section 2.1 of this EA.

#### 5.1.1 Physical Environment

This subsection presents a summary of the physical environment setting of the proposed route. It describes areas of geotechnical concern identified in the vicinity of the pipeline route. Potential pipeline construction-related effects and mitigation are presented in Section 6.2.1 and Section 6.6 of this EA. Photographs of the proposed route are provided in this Section.

##### 5.1.1.1 Physiography

Physiographic characteristics assist in the identification of topographic features and surficial deposits traversed by the proposed pipeline. The proposed route traverses the Souris Plain of the Southwestern Uplands physiographic region (Manitoba Agriculture, Food and Rural Initiatives 2011).

The Southwestern Uplands are characterized by undulating, rolling to hilly topography and the Manitoba Lowlands are characterized by relatively flat to gently undulating relief.

##### 5.1.1.2 Geology

This subsection identifies the types of bedrock that may be encountered along the route and the characteristics of the formations as they may affect pipeline construction activities. Along with glaciation, bedrock geology is the precursor to surficial deposits and soils and, consequently, may have an influence on the chemistry of the soil profile within trench depth.

The Riding Mountain Formation underlies the proposed pipeline route. These Cretaceous-aged strata consist of the Coulter, Millwood, Odanah, Morden, Boyne and Pembina members (Manitoba Mineral Resources Division 1979).

### 5.1.1.3 Surficial Geology

This subsection identifies the surficial deposits that may be encountered within trench depth along the proposed route. Characteristics of the surficial deposits are related to potential concerns such as compaction and rutting, trench instability, erosion hazard and steep topography.

Glacial till deposits consist of unsorted debris from 1-10 m thick that reflect the composition of the underlying bedrock and include extensive areas of hummocky stagnation moraine with relief of greater than 8 m and till plains with relief of less than 3 m (Manitoba Department of Energy and Mines 1981).

Glacial fluvial deposits encountered along the route consist of gravel, sand and silt, 1-100 m thick, deposited in an ice marginal environment; includes subaqueous outwash deposited in glacial lakes, and some late glacial valley fill.

Glaciolacustrine deposits encountered along the proposed pipeline route consist of silt, clay, and sand, up to 30 m thick, forming extensive lake plains and a discontinuous veneer reflecting form of the underlying topography; includes areas of extensive iceberg scouring, areas masked by thin alluvium, and areas of wave washed till and exposed bedrock (Manitoba Department of Energy and Mines 1981).

Alluvial deposits consist of sand, silt, gravel and clay deposited on floodplains along river valleys, on floors of glacial spillways and as alluvial fans along the base of escarpments. The alluvium deposits can be up to 30 m thick (Manitoba Department of Energy and Mines 1981).

The proposed route does not encounter any areas of permafrost or ground instability such as earthquake-prone or landslide-prone areas (Natural Resources Canada (NRC) 2011a,b,c,d,e).

### 5.1.1.4 Climate

This section describes the climatic setting along the proposed route. The climate in the region of the route is characterized by short, warm summers and cold winters with annual precipitation (rainfall and snowfall) range of 467.2 mm to 473.3 mm (Environment Canada 2011). There are no historical records of flooding along the proposed route (NRC 2011f). Average snow fall for the proposed route was highest in December and January. The mean May to September temperature along the proposed route is 11.8°C to 12.3°C.

**TABLE 5.1 SNOWFALL, RAINFALL AND TEMPERATURE AVERAGES (1971-2000) FOR MANITOBA**

Station Location	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
<b>AVERAGE RAINFALL (mm)</b>													
Reston*	0	0	1.7	20.9	47.2	72.8	N	N	47.6	20.3	1.8	0.3	N
Pierson	0.3	0.5	4.7	21.3	52.9	76.8	67.6	51.8	46.7	24.1	5.3	0.8	352.7
Virden	0.2	0.5	6.9	17.2	46.1	77.2	66.1	61	49.2	23.1	4.9	1.3	353.5
<b>AVERAGE SNOWFALL (cm)</b>													
Reston*	23.6	19	14.9	9.1	0.9	0	N	N	0.3	3.6	11.2	17.9	N
Pierson	23.2	17.5	17.2	10.2	1.8	0	0	0	0.1	8.2	17.5	21	116.6

Virden	22.4	17.2	20.3	13.3	3.5	0	0	0	0.6	8	17.9	21.7	124.9
<b>AVERAGE DAILY TEMPERATURES (°C)</b>													
Reston*	-17.2	-13.7	-6.6	4.4	11.3	17.3	N	N	N	N	-4.2	N	N
Pierson	-15.9	-11.5	-4.7	4.7	12.3	17	19.4	18.6	12.6	5.4	-4.8	-13	3.3
Virden	-16.7	-12.2	-5.3	4.2	11.9	16.6	19	18	11.9	5.2	-5.1	-13.7	2.8

Source: Environment Canada 2011

\*1961-1990 climate normals

N - data exists but not enough to derive a value.

### 5.1.2 Soil Capability

This subsection presents a summary of published soil surveys and identifies the soil types that are encountered along the proposed pipeline route. A soils assessment will be conducted for the proposed route during the spring/summer of 2011. Project-related effects and mitigation are presented in Section 6.2.2 of this EA.

#### 5.1.2.1 Soil Characteristics

A soil complex of three soil series (Newdale, Penrith and Varcoe) have been mapped along the proposed route. Black Chernozemic soils of the Newdale soil series are the dominant soils along the proposed route (Manitoba Agriculture, Food and Rural Initiatives 2011; Manitoba Agriculture, Food and Rural Initiatives 2006).

Newdale soils are characterized by Black Chernozemic soils developed over moderately to strongly calcareous, loamy (L, CL) morainal till of limestone, granitic and shale. These soils are moderately well to well drained and occur in mid to upper slope positions of undulating to hummocky landscapes. Surface runoff is moderate to moderately rapid; permeability is moderately slow. Most of these soils are presently cultivated; they have formed under intermixed aspen grove and grassland vegetation. The Newdale solum has a very dark gray Ah horizon, commonly 25 cm thick and ranging from 15 to 35 cm, a dark brown Bm horizon, 10 to 30 cm thick, and a transitional BC horizon, 3 to 15 cm thick. A lime carbonate horizon, 10 to 15 cm thick is often present in shallower soils but is not evident in deeper profiles. Its solum depth averages 58 cm and ranges from 25 to 90 cm.

Penrith soils are characterized by Humic Luvisc Gleysol solum developed on moderately to strongly calcareous, loamy (L, CL) morainal till of limestone, granitic and shale rock origin. These soils are poorly drained and occur in depressional positions of undulating to hummocky landscapes. These soils are ponded for a variable period in the spring and early summer; they usually are free of water in the summer and fall, unless replenished by heavy rains and runoff. Permeability is very slow within the solum and moderately slow in the subsoil. Typical vegetation on these soils consist of sedge and ringed with willow. The solum of the Penrith series commonly has a moderately to strongly decomposed organic layer, 4 to 8 cm thick, a dark gray to gray Ahe horizon, 6 to 10 cm thick, a light gray, platy Aeg horizon, 6 to 10 cm thick, a dark gray to gray Btg horizon, 35 to 45 cm thick, and a gray transitional BC, 15 to 25 cm thick. The A horizon thickness averages 22 cm and ranges from 5 to 45 cm; the average solum depth is 77 cm and ranges from 30 to 105 cm.

The Varcoe soil series is characterized by a Gleyed Rego Black Chernozem (carbonated) solum on moderately to strongly calcareous, loamy (L, CL) morainal till of limestone, granite and shale origin. These soils are imperfectly drained and occur in the lower slope positions of undulating to hummocky landscapes in close association with Angusville soils. They receive runoff from the upper slopes, and in some landscapes, may be influenced by seepage. Permeability is slow and may be restricted during periods of subsoil saturation. In areas where upward groundwater or seepage waters contain appreciable salts, accumulation of salts may occur within the soil. Varcoe profiles average 42 cm in thickness and

range from 20 to 60 cm. The A horizon is usually 28 cm thick and ranges from 20 to 50 cm; very dark gray in color and is underlain by a dark gray transitional AC horizon, 4 to 8 cm thick. A carbonate accumulation horizon (Cca) is commonly present, but may be discontinuous. Gypsum crystals are usually present below and within the carbonate accumulation layer.

The quality of soil along the proposed pipeline route is varied. The CLI (1966) has rated the soils as ranging from having moderate (Class 2) to very severe (Class 5) limitations to agriculture (see Table 5.2).

**TABLE 5.2 CANADA LAND INVENTORY CLASSIFICATIONS ALONG THE PROPOSED PIPELINE ROUTE**

Legal Location	Class	Limitation(s)
Entire Route	2x,3te,5w	combination of two or more adverse limitations; adverse topography; erosion damage and excess water

Sources: CLI 1966

**Notes:**

- Class 2 - Soils that have moderate limitations that restrict the range of crops or require moderate conservation practices.
- Class 3 - Soils that have moderately severe limitations that restrict the range of crops or require special conservation practices.
- Class 4 - Soils that have severe limitations that restrict the range of crops or require special conservation practices, or both.
- Class 5 - Soils have very severe limitations that restrict their capability to producing forage crops and improvement practices are feasible.

Manitoba Agricultural Services Corporation (2007a, 2007b) has placed the soils along the proposed route into one of ten classes (A to J) by comparing ten-year average crop yields to those of benchmark soils (see Table 5.3 of this EA). Soils having the highest yields are classed as A and the lowest yielding soils are rated as J. The productivity rating incorporates land productivity concepts including climate, soil texture, depth of topsoil, organic matter, drainage, salinity, topography and erosion. This soil productivity rating system is considered to provide a more detailed account of agricultural capability of the soils encountered along the route than the CLI classification.

**TABLE 5.3 SOIL PRODUCTIVITY RATINGS ALONG THE PROPOSED PIPELINE ROUTE**

Legal Location	Soil Rating*	Municipal Government
NW 17-10-28 WPM	E <sub>3</sub>	RM of Wallace
SE 18-10-28 WPM	E <sub>3</sub>	RM of Wallace
NE 07-10-28 WPM	E <sub>3</sub>	RM of Wallace
SE 07-10-28 WPM	E <sub>3</sub>	RM of Wallace
NE 06-10-28 WPM	E <sub>3</sub>	RM of Wallace
SE 06-10-28 WPM	E <sub>3</sub>	RM of Wallace
NE 31-09-28 WPM	E <sub>3</sub>	RM of Pipestone
SE 31-09-28 WPM	E <sub>3</sub>	RM of Pipestone
NE 30-09-28 WPM	E <sub>3</sub>	RM of Pipestone
SE 30-09-28 WPM	E <sub>3</sub>	RM of Pipestone
NE 19-09-28 WPM	F <sub>3</sub>	RM of Pipestone
NW 20-09-28 WPM	E <sub>3</sub>	RM of Pipestone
SW 20-09-28 WPM	E <sub>3</sub>	RM of Pipestone

---

**Sources:** Manitoba Agricultural Services Corporation 2007a, 2007b.

**Note:** \* Soil productivity ratings range from Highest (A) to lowest (J) yielding soils with each subsequent class representing a slightly less productive class than the previous class. Numbers denote Risk Areas, which place areas with similar soils and/or climate into a common group. An "I" soil in Risk Area 3 may not have the same productivity as an "I" soil in Risk Area 4.

### **5.1.3 Water Quality and Quantity**

This subsection presents a summary of the findings related to water quality and quantity and describes the hydrological resources and related contaminants of concern along the proposed route. Potential pipeline construction-related effects and mitigation are presented in Section 6.2.3 of this EA.

#### **5.1.3.1 Surface Water**

The proposed pipeline is located in the Oak Lake (AR05) watershed of the Assiniboine River drainage basin (Manitoba Agriculture, Food and Rural Initiatives 2011).

The Assiniboine River basin covers an area of 17,300 km<sup>2</sup> (SWA 2005). The headwaters of the Assiniboine River are about 50 km northwest of Preeceville in the Porcupine Hills. The Whitesand River originates in the Beaver Hills northwest of Yorkton, Saskatchewan and joins the Assiniboine River near Kamsack. The Assiniboine River continues southeast for another 45 km before entering Lake of the Prairies near the Manitoba border (SWA 2005).

Three watercourses with defined bed and banks will be crossed by the proposed pipeline. All watercourses will be bored, no fish or fish habitat assessments were conducted. There are no designated or nominated Canadian Heritage Rivers crossed by the proposed pipeline route (Canadian Heritage Rivers System 2007).

#### **5.1.3.2 Water Quality**

Surface water quality for the minor watercourses crossed by the proposed route is not publicly available.

#### **5.1.3.3 Groundwater**

Groundwater movement in Manitoba is predominantly from west to east with discharge occurring in the outcrop area beneath Lake Winnipeg. A large area of anomalously high head is found in extreme southwestern Manitoba, creating a local northerly component to groundwater movement in this area. Fresh water recharge to the aquifer occurs in southeastern Manitoba where the outcrop area underlies a series of upland moraines. Groundwater movement is to the west and northwest from this recharge area. Westward moving recharge is eventually deflected northward along a fresh water-saline water boundary and migrates toward Lake Winnipeg (Betcher *et al.* 1995).

No bedrock aquifers are encountered at less than 150 m depths (Manitoba Conservation 1986a) along the proposed pipeline route.

The proposed pipeline route does not traverse lands within the scope of the Oak Lake Aquifer Management Plan area (Oak Lake Aquifer Technical Advisory Group 2000). In any case, there are no mitigation recommendations within this aquifer management plans which apply to pipeline construction.

A search of Manitoba Water Stewardship's database of water well drilling records will be conducted prior to construction to determine water wells in the quarter-sections crossed by the proposed route. A detailed listing of springs within Manitoba is not publicly available.

Sand and gravel aquifers along the proposed pipeline route are very few widely scattered minor sand and gravel aquifers. Bedrock is at or near the ground surface or surficial deposits consist mainly of low permeability materials e.g., clay and till (Manitoba Conservation 1986b).





#### **5.1.4 Greenhouse Gases and Air Quality**

This subsection addresses air quality concerns in the Local Study Area (LSA) and Regional Study Area (RSA) defined below. For discussion on potential impacts and mitigation pertaining to air quality refer to Section 6.2.4 of this EA.

The LSA consists of the area which could potentially be affected by construction and reclamation activities as well as associated works and activities beyond the Footprint area. The local boundary varies with the discipline and issue being considered (*e.g.*, for assessment of the effects of noise on wildlife, the area affected by noise (*i.e.*, 2 km buffer) from the source is included in this boundary).

The RSA consists of the area extending beyond the LSA boundary. The boundary for the regional area also varies with the discipline and the issue being considered (*e.g.*, for socio-economic analysis, regional boundaries include large communities that will be used as construction offices or regional MD boundaries).

The proposed route is located in an area that is relatively protected from industrial and commercial development. This contributes to the high baseline air quality found in the RSA. Air quality in the LSA is primarily a function of anthropogenic sources of emissions. Substance release sources in the LSA, include emissions from vehicle traffic as well as agriculture and industrial activities.

Potential sources of emissions from vehicle traffic are identified in Table 5.12 of Section 5.1.16.1 of this EA. Emissions will result from pipeline construction equipment and traffic during the construction phase, however, an increase in airborne emissions will not occur during operations or maintenance. Potential receptors to nuisance air emissions in the LSA include local residences and communities. Locations of these communities are identified in Table 5.11 of Section 5.1.11 of this EA.

#### **5.1.5 Acoustic Environment**

This subsection examines the acoustic environment in the LSA. Noise generated by the operation of the pipeline is undetectable and is not anticipated to contribute to the background noise levels in the vicinity of the pipeline. As a result, this subsection focuses on noise generated by construction activities. Potential impacts and mitigation pertaining to the acoustic environment are discussed in Section 6.2.5 of this EA.

Background noise in the LSA is primarily caused by vehicle traffic identified in Table 5.12 of Section 5.1.16.1 of this EA. Potential receptors to nuisance noise emissions include local residences and communities. Locations of these communities are identified in Table 5.11 of Section 5.1.11 of this EA. An elevated level of noise will result from equipment and traffic during construction of the proposed pipeline. However, an increase in noise levels over existing levels will not occur during operations.

#### **5.1.6 Fish and Fish Habitat**

Three watercourses will be crossed by the proposed pipeline. As all watercourses will be bored, no fish or fish habitat assessments were conducted.

Additional information on water bodies along the route is provided in Section 5.1.3 of this EA. Potential impacts arising from the construction of the proposed pipeline and mitigation pertaining to fish and fish habitat are discussed in Section 6.2.6 of this EA.

Bellhole excavation for boring activities will be conducted outside of the riparian zone of all watercourses, therefore disturbance to fish or fish habitat will be avoided. Pre-construction site assessments will be conducted on both sides of each watercourse crossing where bell excavation will be required. In addition, photographic records of proposed water crossings of the proposed route will be provided.

Table 5.4 of this EA provides a summary of the watercourses that will be crossed by the proposed pipeline route.

**TABLE 5.4 WATERBODIES AND DRAINAGES CROSSED BY THE PROPOSED ROUTE**

Watercourse	Legal Location	Width at Crossing	Construction Plan	Xing#
Dry Drainage	NE 06-10-28 WPM	< 5 m	C1	15
Dry Drainage	SE 07-10-28 WPM	< 5 m	C2	12
Dry Draw	NE 31-09-28 WPM	< 5 m	C2	1

### 5.1.7 Wetlands

This subsection presents a summary of the wetlands identified along the proposed pipeline route. Potential effects on wetlands related to the construction and operation of the proposed pipeline are presented in Section 6.2.7 of this EA.

The proposed route traverses the Continental Prairie Wetland Region where common wetlands are marshes and shallow waters, usually in association with shallow basin, kettle or shore water. The climate is semi-arid with cold winters and hot summers (Government of Canada 1986). This wetland region represents an area within which similar characteristic wetlands develop in locations that have similar topography, hydrology and nutrient regimes, thereby resulting in wetland habitat.

The Continental Prairie Wetland Region is also referred to as the Prairie Pothole Region. The wetlands in this region were formed by glacial action during the Pleistocene. This region, because of the numerous shallow lakes and marshes, the rich soils, and the warm summers, is described as being one of the most important wetland regions in the world (Weller 1981). It is estimated that 50-75% of all North American waterfowl, in any given year, come from this region (Leitch and Danielson 1979). In addition, the greatest threat to the health of the region results from ongoing draining or altering of prairie potholes for agricultural reasons (Leitch 1981).

Most of the wetland habitat in the RSA is low-lying prairie and wet meadow where wet conditions persist at times of high-water (*i.e.*, in the spring or during wet years). Wetland areas were identified as per Stewart and Kantrud (1971) during the route selection process.

Wetlands were avoided as a result of routing criteria (*e.g.*, avoidance of wetlands, minimizing impact) for the proposed pipeline route.

The proposed pipeline route is not proximal to any named lakes, Important Bird areas or NAWMP priority areas.

### 5.1.8 Vegetation

This subsection presents a summary of the findings related to ecosystem classification, non-native and invasive species as well as rare vascular plants and communities. Potential Project-related impacts and mitigation pertaining to vegetation are discussed in Section 6.2.8 of this EA.

#### 5.1.8.1 Ecosystem Classification

The proposed pipeline route is located in the Aspen Parkland Ecoregion of Canada (Environment Canada 2000). The Aspen Parkland Ecoregion extends in a broad arc from southwestern Manitoba, north and west through Saskatchewan to its northernmost point in central Alberta. This ecoregion is a transitional area between the boreal forest to the north and the grasslands to the south. Most of the ecoregion is now farmland. In its native state, the landscape was characterized by trembling aspen, oak groves, mixed tall

shrubs and intermittent fescue grasslands. Open stands of trembling aspen and shrubs occur on most sites, and bur oak and grassland communities occupy increasingly drier sites on loamy Black Chernozemic soils. Poorly-drained, Gleysolic soils support willow and sedge species (Environment Canada 2000).

#### 5.1.8.2 Non-native and Invasive Species

Vegetation surveys in non-cultivated areas along the proposed pipeline route will be conducted in spring/summer 2011.

Weeds of management concern listed in the Manitoba *Noxious Weeds Act* and *Noxious Weeds Regulation* were reviewed prior to the 2011 vegetation reconnaissance. The Regulation states that Noxious weeds and Noxious weed seeds must be destroyed. Introduced species encountered during the survey were also noted. Although these species have no designation under the Manitoba *Noxious Weeds Act* or *Noxious Weeds Regulation*, the density of the infestation or the invasive nature of the plant may warrant mitigation.

Prior to construction, the local Manitoba Agriculture GO offices in the vicinity of the proposed route will be contacted to determine certain weed species of management concern in the project area.

A weed survey is recommended to address any weed issues identified along the entire route prior to construction (see Section 9.0 of this EA).

#### 5.1.8.3 Rare Vascular Plants

A vegetation reconnaissance will be conducted along non-cultivated segments of the proposed pipeline route in the spring/summer of 2011 (Table 5.5).

Prior to the field assessment, a literature review was conducted to identify rare plant species and plant communities with potential to occur in the project area (Appendix 5B of this EA). Tables of potential rare vascular plant species and rare plant communities were produced using data available from the Manitoba Conservation Data Centre (MB CDC).

The MB CDC provides tables of rare species and plant communities by ecoregion (MB CDC 2011). The MB CDC data were supplemented with range information based on the distribution maps in *The Rare Vascular Plants of Manitoba* and the published volumes of the Flora of North America (FNA) (White and Johnson 1980, FNA Editorial Committee 1993+). Vascular plant species of special conservation status within the vicinity of the proposed pipeline route, their habitat as well as federal and provincial status are listed in Appendix 5B of this EA.

**TABLE 5.5 SPRING/SUMMER 2011 PROPOSED VEGETATION RECONNAISSANCE LOCATIONS**

Location (WPM)	Land Type
SE 06-10-28 WPM	Remnant aspen parkland/shelterbelt
NE 07-10-28 WPM	Remnant aspen parkland/shelterbelt
NE 31-09-28 WPM	Pasture

The proposed pipeline route lies within the range and potentially provides preferred habitat for 14 listed Species at Risk under Schedule 1 of SARA (Environment Canada 2011).

The MB CDC has records of at least three rare plant species occurring within 2 km of the proposed route (see Table 5.6 of this EA).

**TABLE 5.6**  
**RARE PLANT SPECIES RECORDED BY MANITOBA CONSERVATION DATA CENTRE WITHIN 2 KM**  
**OF THE PROPOSED PIPELINE ROUTE**

COMMON NAME	SCIENTIFIC NAME	G/S RANK	MB EA	COSEWIC	SARA
Shining Arnica	<i>Arnica fulgens</i>	G5/S2	Not Listed	Not Listed	Not Listed
Narrow-leaved Milk Vetch	<i>Astragalus pectinatus</i>	G5/S2S3	Not Listed	Not Listed	Not Listed
Golden Bean	<i>Thermopsis rhombifolia</i>	G5/S2	Not Listed	Not Listed	Not Listed

Source: MB CDC 2011

Note: Provincial ranks are defined in the footnotes of Appendix 5D of this EA.

### 5.1.9 Wildlife and Wildlife Habitat

This subsection identifies representative wildlife species and wildlife habitats that may be encountered in the vicinity of the proposed pipeline route. This information assists in identifying the potential need for special measures to be implemented during construction. These measures could include modifications to the construction schedule, access control, adjustments to the construction right-of-way width, visual screening, habitat restoration / replacement and others depending on the site-specific circumstance. Potential impacts and mitigation pertaining to wildlife are discussed in Section 6.2.9 of this EA.

#### 5.1.9.1 Wildlife Species and Habitat of Concern

The proposed pipeline route does not traverse any DU wetland projects or Manitoba Habitat Heritage Corporation (MHHC) Conservation Agreements (CAs).

The North American Waterfowl Management Plan has designated priority areas which are particularly important to waterfowl in Manitoba. None of the proposed pipeline route will be located within these priority areas.

The proposed route does not traverse any Wetlands of International Importance, Migratory Bird Sanctuaries or World Biosphere Reserves (Bureau of the Convention on Wetlands 2006, Environment Canada 2011, UNESCO 2006).

During the breeding season, passerine diversity is high in the vicinity of the pipeline route. Species known to occur include: eastern bluebirds; mountain bluebirds; loggerhead shrike (western subspecies); Nelson's sharp-tailed sparrow; Le Conte's sparrow; grasshopper sparrow; and Baird's sparrow. Burrowing owl and ferruginous hawk are two raptors known to breed in the region. The migratory bird restricted activity period for lands in the vicinity of the proposed pipeline route extends from April 1 to July 31.

The proposed route does not traverse any existing or currently proposed ecological reserves or wildlife management areas where there are restrictions on energy development.

The proposed pipeline route traverses one habitat subregion as defined by Poston *et al.* (1990). Habitat subregions are landscape divisions based primarily on soils, however, there are also distinct on the basis of elevation, relief, landform, drainage and general substrate. Habitat subregions contain habitat of varying importance for migratory birds and are listed in Table 5.7 of this EA (Poston *et al.* 1990).

**TABLE 5.7  
SIGNIFICANT MIGRATORY BIRD HABITAT SUBREGIONS TRAVERSED BY  
THE PROPOSED PIPELINE ROUTE**

Legal Location	Habitat Subregion Reference No.	Habitat Subregion	Significance <sup>1</sup> (Local, Regional or National) <sup>1</sup>
Entire Route	4.56	Pipestone Plain	Local - breeding burrowing owls National - breeding ducks Local - breeding burrowing owl

Source: Poston *et al.* 1990

Note: 1. While the proposed pipeline route traverses the habitat subregion, it may not traverse any site-specific areas providing the noted significance.

The proposed pipeline route lies within the range and potentially provides preferred habitat for 14 listed Species at Risk under Schedule 1 of SARA (Environment Canada 2011). A summary of mammals and birds identified within 2 km of the proposed pipeline right-of-way by the Manitoba Conservation Data Centre is provided in Table 5.8.

**TABLE 5.8 STATUS OF WILDLIFE SPECIES IDENTIFIED BY THE MANITOBA CONSERVATION DATA CENTER WITHIN 2 KM OF THE PROPOSED PIPELINE ROUTE**

COMMON NAME	SCIENTIFIC NAME	G/S <sup>1</sup> RANK	MB EA	COSEWIC	SARA
Bobolink	<i>Dolichonyx oryzivorus</i>	G5	Not Listed	Threatened	Not Listed

Sources: MB CDC 2011b

**Notes:**

- Provincial (S) ranks are based solely on the species' status within the province, and range from 1 (5 or fewer occurrences) to 5 (demonstrably secure under present conditions) (NatureServe 2011).  
S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).  
S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).  
S3 = Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.  
S4 = Apparently Secure: uncommon but not rare, and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.  
S5 = Secure: common, widespread, and abundant in the province. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.  
S#S# = Range Rank: a numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element.  
B = Breeding: basic rank refers to the breeding population of the element.  
NR = Not ranked.
- Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (5 or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed (NatureServe 2011).
- COSEWIC (2011). Species listed as 'Extirpated', 'Not at Risk' or 'Data Deficient' were generally not included in the table without other noteworthy factors being present.  
**Endangered:** A species facing imminent extirpation or extinction.  
**Threatened:** A species likely to become endangered if limiting factors are not reversed.

**Special Concern:** A species that is particularly sensitive to human activities or natural events, but is not an endangered or threatened species.

4. Manitoba *Endangered Species Act*

**Endangered:** any native Manitoba species that is threatened to disappear throughout all or most of its Manitoba range.

**Threatened:** any native Manitoba species likely to become endangered or at risk due to low or declining numbers in Manitoba if the factors affecting it do not improve.

5. SARA. The *Act* establishes Schedule 1 as the list of species to be protected on all federal lands in Canada. The *Act* also applies to all lands in

Canada for Schedule 1 bird species cited in the *Migratory Birds Convention Act* and Schedule 1 aquatic species as determined by DFO

Endangered: a species that is facing imminent extirpation or extinction.

Threatened: a species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern: a species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

Field investigations of wildlife and wildlife habitat along remnant native vegetation segments of the proposed pipeline route will be conducted prior to development in the spring/summer of 2011. A systematic field investigation on foot will be conducted to observe native habitats along and immediately adjacent to the proposed pipeline right-of-way. The proposed route was examined for the potential presence of wildlife habitats and features that may be limited and/or locally important to wildlife species of concern (e.g., snags, rock outcrops, burrows, dens, wildlife trees with cavities, stick nests, wetlands and watercourses, mineral licks, or other important features). All mammals, birds, amphibians and reptiles identified by sight, sound or sign will be noted and identified.

### 5.1.9.2 Ecosystem Classification

The Aspen Parkland Ecoregion extends in a broad arc from southwestern Manitoba, northwest through Saskatchewan to its northern apex in central Alberta. The ecoregion is considered transitional between the boreal forest to the north and the grasslands to the south. Associated with the rougher hummocky glacial till, landscapes are numerous tree-ringed, small lakes, ponds and sloughs that provide important habitat for waterfowl. The ecoregion also provides a major breeding habitat for waterfowl and includes habitat for white-tailed deer, coyote, snowshoe hare, cottontail, red fox, northern pocket gopher, Franklin's ground squirrel, sharp-tailed grouse and black-billed magpie (Environment Canada 2011).

### 5.1.9.3 Land Capability

Lands along the proposed pipeline route have been rated by the CLI (1970a) as having slight (Class 3) limitations to the production of ungulates (Table 5.9). The proposed pipeline route avoided winter range habitat located in creek valleys such as Pipestone Creek.

**TABLE 5.9  
LANDS ALONG THE PROPOSED PIPELINE ROUTE RATED AS HAVING  
NO SIGNIFICANT (CLASS 1) TO SLIGHT (CLASS 3) LIMITATIONS  
TO THE PRODUCTION OF UNGULATES**

Legal Location	Class	Limitations
Entire route	3g(D)	Poor distribution or interspersed of landforms

Sources: CLI (1970a)

Notes: Class 1 = No significant limitations to the production of ungulates.  
Class 2 = Very slight limitations to the production of ungulates.  
Class 3 = Slight limitations to the production of ungulates.  
W = Winter Range.

Lands along the proposed pipeline route generally provide slight limitations to the production of waterfowl (CLI 1970b). Lands along the proposed route which have been rated by the CLI as having no significant (Class 1) to slight (Class 3) limitations to the production of waterfowl are presented in Table 5.10 of this EA.

**TABLE 5.10  
LANDS ALONG THE PROPOSED PIPELINE ROUTE RATED AS HAVING  
NO SIGNIFICANT (CLASS 1) TO SLIGHT (CLASS 3) LIMITATIONS  
TO THE PRODUCTION OF WATERFOWL**

Legal Location	Class	Limitations
E ½ 06-10-28 WPM	3g	Poor distribution or interspersed of landforms

Sources: CLI (1970b)

Notes: Class 3 = Slight limitations to the production of waterfowl.

### 5.1.10 Species at Risk

This subsection identifies plant and animal species listed under Schedule 1 of SARA, whose range and habitat potentially occur along the proposed route. Recorded locations of species at risk occurrences in the vicinity of the proposed route were obtained through a Conservation Database search (MB CDC 2011b) and wildlife surveys conducted during previous construction projects in the area.

Lists of rare species and plant communities potentially occurring in the vicinity of the proposed route are presented in Appendices 5B of this EA.

Potential pipeline-related impacts and mitigation pertaining to the species at risk are discussed in Section 6.2.10 of this EA.

The proposed pipeline route is within the range and habitat of 14 SARA listed species at risk: least bittern (Threatened); loggerhead shrike excubitorides subspecies (Threatened); peregrine falcon anatum subspecies (Threatened); piping plover circumcinctus subspecies (Endangered); Sprague's pipit (Threatened); yellow rail (Special Concern); northern prairie skink (Endangered); northern leopard frog (Special Concern); monarch (Special Concern); hairy prairie-clover (Threatened); Buffalo grass (Threatened); western spiderwort (Threatened); small white lady's-slipper (Endangered) and silver chub (Special Concern) (COSEWIC 2011).

An overview of the above Schedule 1 listed SARA species is provided below.

#### 5.1.10.2 Vascular Plant Species at Risk

There are four vascular plant SARA listed species whose range and habitat occur in the vicinity of the proposed route.

##### Hairy Prairie-Clover

The hairy prairie-clover (*Dalea villosa* var. *villosa*) is of special status under SARA (Threatened), COSEWIC (Threatened) in Manitoba (S2). This perennial species is found in the great plains from the Upper Peninsula of Michigan west to southcentral Saskatchewan and south to central Texas. In Canada, it appears to be confined to one site in Saskatchewan and two sites in southwestern Manitoba.

In Manitoba, the most successful population, in the Lauder Hills, is in the low thousands, while the other one, in Spruce Woods Provincial Park, has between 1,000-1,500 plants (Environment Canada 2011). Canadian populations of this plant occur in the Mixed Grassland region, where they are restricted to the sand hill complex.



---

The species appears to be best adapted to active sand or sand hill blowouts, although it is also found on partially stabilized sand in dune slack areas. The region's climatic zone is characterized by low annual precipitation (30-40 cm), high evaporation rates and fast runoff. Two-thirds of the precipitation falls as rain in the spring. In Canada, the plants flower from late July to late August, setting seed in September (Environment Canada 2011). Since the species requires at least partly active sand dunes to survive, it is threatened where dunes tend to stabilize.

Grazing and fires play an important role in the dynamics of dune systems and affect populations of the plant. More than two-thirds of the mixed grasslands have been destroyed by cultivation and further conversion of hairy prairie-clover habitat is a threat. In Spruce Woods Provincial Park, hairy prairie-clover habitat is interlaced with hiking trails, and hiking is not restricted to the trails. This type of pressure, which includes the use of all-terrain vehicles (ATVs) in the Dundurn Sand Hills, for example, is also detrimental (Environment Canada 2011).

### Buffalo Grass

Buffalo grass (*Buchloe dactyloides*) is of special status under SARA (Threatened), COSEWIC (Threatened), and in Manitoba (S1). This perennial species reaches the northernmost limit of its range in southeastern Saskatchewan (near Estevan) and southwestern Manitoba (near Coulter), along the Souris River Valley. South of the border the species extends south to south-central Mexico.

In Manitoba, where 90% of the Canadian Buffalo grass occurs, the single population represents about 4,800 clones and covers one hectare (Environment Canada 2011). The proposed pipeline is not within the range of this plant. Buffalo grass is a grayish-green, curly-leaved grass that forms dense, matted sods. Male plants have slender, erect stems 6-12 cm high, bearing 1-3 short spikes about 1 cm long, consisting of two-flowered spikelets. The female plants have very short, often prostrate stems beneath the leaves, bearing tight clusters of one-flowered spikelets that form hard globular burs of 1-5 seeds. The plants can also reproduce by above-ground trailing stems (stolons) (Environment Canada 2011).

Buffalo grass is not very tolerant to shade, and is seemingly dependant on clay or clay-loam substrate; early season moisture with subsequent drying; moderate erosion, or cattle-trampling and grazing; and no competition from other mixed-grass prairie species. It begins growth in mid-spring and flowers in summer, setting seed soon thereafter. The heavy toothed burs are more effectively dispersed by ungulates and water than by wind. Only half the seeds germinate the first year, the others requiring one or more years of dormancy. Populations form circular clonal patches of 0.5-3.0 m in diameter (Environment Canada 2011).

Major threats to Buffalo grass in Canada are the destruction of its habitat for agricultural use, road or dam building, and clay pit-mining or coal strip-mining. Fire-suppression might also be limiting the species (Environment Canada 2011).

### Western Spiderwort

The western spiderwort (*Tradescantia occidentalis*) is of special status under SARA (Threatened), COSEWIC (Threatened) and in Manitoba (Endangered on the Manitoba *Endangered Species Act* and S1) It is a perennial flowering plant of sand dunes. In Canada, the western spiderwort is at the northern limit of its range. It occurs at only four sites in the southern part of the Prairies: Pakowki Lake Sand Hills in southeastern Alberta, Douglas Provincial Park in Saskatchewan, and Lauder and Routledge sand hills in southwestern Manitoba. The two sites in Manitoba are connected to the main range of the species in the US (Environment Canada 2011).

Surveys from 1996 to 2002 indicate that the western spiderwort population in Canada has fluctuated from a low of about 15,000 to a high of about 50,000 plants, with the majority found at two Manitoba sites. In 2001, a year with low precipitation, the Alberta site had only 7 plants; in 2002, under more favourable conditions, 7,450 plants were counted. Above average moisture in the summer increases both population size and the length of the flowering period. After flowering, the above-ground parts of the plant dry up and

---

---

new shoots grow from the base of the stem. These aboveground shoots require a protective layer of snow to survive the winter and resume growing the following spring (Environment Canada 2011).

The western spiderwort grows on partly stabilized sand dune ridges, usually on the crests and steeper south-facing slopes. It is typically associated with areas of active, drifting sand, where vegetation is relatively sparse. In Manitoba, the western spiderwort has also been known to grow in meadows and in shaded habitat, especially in grazed areas (Environment Canada 2011). Loss of habitat is the main factor in the decline in western spiderwort populations. The conversion of native prairie into agricultural lands has greatly decreased the amount of suitable habitat for the species. Petroleum exploration and extraction in Manitoba is also threatening to wipe out the largest population in Canada. Leafy spurge (*Euphorbia esula*), an exotic weed that spreads very quickly and forms dense stands, is a threat to some western spiderwort populations. The increased vegetation that occurs when dunes are stabilized causes shading, and results in a habitat that is unsuitable for western spiderwort.

High levels of grazing by cattle can seriously threaten populations of western spiderwort, but light to moderate grazing prevents vegetation from encroaching and helps to maintain the active dune habitat (Environment Canada 2011). The western spiderwort is protected under the federal SARA. The western spiderwort is listed as Threatened under the Manitoba *Endangered Species Act*. It is illegal to kill, harm, possess, interfere with or damage the habitat of listed species in Manitoba. In Saskatchewan, the western spiderwort is designated as Endangered under the provincial *Wildlife Act* and is protected from being disturbed, collected, harvested, captured, killed or exported (Environment Canada 2011).

#### Small White Lady's-Slipper

The small white lady's-slipper (*Cypripedium candidum*) is of special status under SARA (Endangered), COSEWIC (Endangered) and in Manitoba (Endangered on the Manitoba *Endangered Species Act* and S1). The small white lady's-slipper is a terrestrial perennial orchid which measures 20-36 cm in height. It grows from a rhizome and forms a bunch of 3-60 stems. About 3 or 4 long straight leaves grow from the centre of the stem. The flower of this plant resembles a small slipper, hence its name. This small white flower is sometimes coloured by a delicate purple line; the opening and the interior of the flower are speckled with darker purple; the petals are twisted (Environment Canada 2011). In the past, the small white lady's-slipper occurred in open tall grass prairies, dry-mesic hillsides, low calcareous prairies and calcareous fens. Today, due to agricultural development and urbanization in the western provinces, it is found in prairie openings in wooded grasslands, or on more open sites with a southerly aspect and calcareous sandy loam soil. The few plants which survive in the eastern part of the country are found in marshes, in marshy limestone meadows, or prairie areas and on the edges of brush (Environment Canada 2011).

#### **5.1.10.3 Wildlife Species at Risk**

The following provides information for 11 wildlife species whose range and habitat occur in the vicinity of the proposed route.

#### Bobolink

The Bobolink *Dolichonyx oryzivorus* is a species of special status under COSEWIC (Threatened) and in Manitoba (S4B). In Manitoba, the Bobolink breeds from Swan Lake to the US border. It winters in southern South America (COSEWIC 2010).

Over 25% of the global population of Bobolink breeds in Canada, which is the northern part of its range. The species has suffered severe population declines since the later 1960's. The species is threatened by incidental mortality from agricultural operations, habitat loss and fragmentation, pesticide exposure and bird control at wintering roosts.

The Bobolink link nests primarily in forage crops (e.g., hayfields and pastures) dominated by a variety of species such as clover, Timothy, tall grasses and broadleaved plants. The first adults arrive in Mid-May.

---

---

Nests are constructed on the ground, usually at the base of large forbs. Each size is typically 3-7 eggs. Hayfields and associated pastures are its preferred habitat due to the plant cover present at the start of the nesting season.

In Canada, the Bobolink population is estimated at between 1.8 and 2.2 million breeding birds (COSEWIC 2010).

#### Loggerhead Shrike *excubitorides* Subspecies

The loggerhead shrike *excubitorides* subspecies (*Lanius ludovicianus excubitorides*) is of special status under SARA (Threatened), COSEWIC (Threatened), and in Manitoba (Endangered on the *Endangered Species Act* and S3S4B). In Canada, the loggerhead shrike *excubitorides* subspecies breeds in north-central, central and southern Alberta, central and southern Saskatchewan, and southern Manitoba. It winters in the southern United States (COSEWIC 2004).

This subspecies seems to have been declining since the turn of the century; the greatest declines have occurred in the last 25 or more years. The population in Manitoba and eastern Saskatchewan is declining (COSEWIC 2004). Loggerhead shrikes inhabit open areas with scattered shrubby growth. They are found in open country, savannah, desert scrub and open woodland where they seem to prefer pastures and open areas with telephone poles and fence posts. They do not adapt well to changes in their habitat. Loggerhead shrikes begin breeding in their first spring and tend to use the same territory year after year. In Canada, second broods are rare, probably because of the short breeding season. Clutches contain 4-6 eggs. Loggerhead shrikes have a high rate of reproductive success; however, this is currently exceeded by their rate of mortality (COSEWIC 2004).

Pesticides are an important factor in the decline of loggerhead shrikes. As a predator at the top of the food chain, the loggerhead shrike accumulates chemicals in its tissues. In the prairie provinces, new agriculture practices, including the removal of hedgerows, shrubs and trees and the draining of potholes and sloughs have had the effect of shrinking the habitat available for loggerhead shrikes. Road mortalities are a major cause of death, especially for juveniles, since these birds often nest and forage close to roads. The young are also susceptible to heavy rainfall and cold temperatures (COSEWIC 2004).

#### Piping Plover *circumcinctus* Subspecies

The piping plover (*Charadrius melodus circumcinctus*) is of special status under SARA (Endangered), COSEWIC (Endangered) and in Manitoba (Endangered on the *Endangered Species Act* and S2B). In Canada, the *circumcinctus* subspecies breeds in central Alberta, southern Saskatchewan, southern Manitoba, and used to breed in southern Ontario. It winters along the Atlantic coast, from south Carolina to Florida, and along the coast of the Gulf of Mexico (Environment Canada 2011).

Piping plovers nest just above the normal high-water mark on exposed sandy or gravelly beaches. On the prairies, nesting occurs on gravel shores of shallow, saline lakes and on sandy shores of larger prairie lakes. Seeps also provide important foraging habitat on the prairies. Clutches usually contain four eggs. Both parents participate in the incubation of eggs and care of nestlings, although the young are able to find their own food within hours of hatching. Females can begin to breed at one year of age and will re-nest once or twice in a season if the eggs are destroyed, but raise only one brood per year (Environment Canada 2011).

The most important limiting factor for the piping plover *circumcinctus* subspecies is loss of habitat due to human use of beaches and the consequent disturbance of nesting sites (Environment Canada 2011).

#### Sprague's Pipit

The Sprague's pipit (*Anthus spragueii*) is of special status under SARA (Threatened), COSEWIC (Threatened), and in Manitoba (S2S3B). This ground-nesting songbird is endemic to the Canadian prairies and northern great plains of the US. It breeds from the foothills of the Rocky Mountains in

---

southern and central Alberta, to west-central and southern Manitoba, and south to southern Montana, northern South Dakota and northwestern Minnesota. Sprague's pipits winter in the southern US and the northern two-thirds of Mexico (Environment Canada 2008).

The species remains common in suitable habitat, particularly on the Canadian prairies. However, breeding bird survey data collected over the past 30 years show that populations are declining rapidly in many parts of the range, particularly during the last 15 years (Environment Canada 2008).

Native grassland is an important habitat for Sprague's pipit. The species is rarely found in cultivated lands, or in areas where native grasses have been replaced with introduced forages. In general, the pipits prefer native vegetation of intermediate height and density, with moderate amounts of litter. Such areas tend to occur where habitats are lightly to moderately grazed, or where fires periodically remove vegetation. Areas of suitable habitat must be less than 150 ha to be attractive as breeding sites for this species (Environment Canada 2008). Less than one in three nesting attempts is successful, with depredation of eggs or young being the most usual cause of failure. Productivity might also be reduced by brown-headed cowbirds, which have been known to parasitize (lay their eggs in) up to 25% of Sprague's pipit nests (Environment Canada 2008).

Habitat loss is the primary cause of decline in this species. Other factors which may reduce habitat suitability are: intensive grazing which removes vegetation and may cause reproductive failure due to disturbance and trampling of nests; haying; fragmentation of habitat; and reduction in fire frequency, which encourages encroachment of woody vegetation and promotes excessive growth of vegetation and accumulation of litter. The use of pesticides to control grasshoppers may also impact Sprague's pipit populations, since grasshoppers are an important food item for the adults and nestlings during the breeding season. The most significant 'natural' limiting factor for the species is probably drought, which affects nesting habitat and possibly food supply at the local level (Environment Canada 2008).

#### Yellow Rail

The yellow rail (*Coturnicops noveboracensis*) is of special status under SARA (Special Concern), COSEWIC (Special Concern), and in Manitoba (S4B). The Canadian breeding range includes the Mackenzie District of the Northwest Territories, eastern Alberta, central Saskatchewan, most of Manitoba and Ontario, the southern half of Quebec, all of New Brunswick and northern Nova Scotia (COSEWIC 2009a).

Nesting yellow rails are typically found in marshes dominated by sedges, true grasses and rushes, where there is little or no standing water (generally 0-12 cm water depth), and where the substrate remains saturated throughout the summer. They can be found in damp fields and meadows, on the floodplains of rivers and streams, in the herbaceous vegetation of bogs, and at the upper levels (drier margins) of estuarine and salt marshes. Nesting habitats usually have a dry mat of dead vegetation from previous growing seasons. A greater diversity of habitat types is used during migration and winter than during the breeding season. In winter, the rails are known to use coastal wetlands and rice fields (COSEWIC 2009a).

The loss and degradation of wetlands due to agricultural and human development are the greatest threats to this species throughout its breeding range (COSEWIC 2009a).

#### Burrowing Owl

The burrowing owl (*Athene cunicularia*) is of special status under SARA (Endangered), COSEWIC (Endangered), and in Manitoba (Endangered on the *Endangered Species Act* and S1B). This owl occurs in western North America in open country from southern Canada to Mexico. Most of the Canadian population occurs in a belt from Regina, Saskatchewan to Lethbridge, Alberta, and infrequently in BC's southern interior (11). Historically, the species occurred east to Winnipeg, west to Calgary, and north to Dauphin, Prince Albert and Wetaskawin. The winter range is the southern United States and Mexico. The Canadian population has always been limited by the extent of grasslands. Over 75% of the prairies have

---

---

been cultivated and much of the remaining grasslands have been altered by other human activities. An estimated 2000 pairs occurred in Canada in 1977: 100 in Manitoba; 1,300 in Saskatchewan; 600 in Alberta; and a few in British Columbia. The Canadian population fell to an estimated 1,685 to 1,010 pairs in 1995. In the 1990's landowners reported a decline of 22% per year. There are now less than 800 pairs in the Canadian prairies (Environment Canada 2010). The species is now absent or rare in regions where it was once common.

The burrowing owl requires treeless plains largely free of visual obstructions, such as grasslands grazed by livestock. It uses burrows abandoned by ground-dwelling mammals (e.g., badgers, gophers and prairie dogs) for nesting, roosting and caching food. Short or sparse vegetation and permanent cover are preferred around the burrows. Grasslands with thicker vegetation support the small mammals that they eat. Consequently, the owls need a mosaic of grass densities to successfully breed. The species is sometimes found on roadsides, crop lands and in urban areas where mowing keeps expanses of grass short (Environment Canada 2010).

The availability of suitable burrows is essential to burrowing owl habitation. In addition to serving as nesting sites, burrows provide shelter from wind, rain, sun, and predatory hawks. Unfortunately, cultivation of pastures, extermination of ground squirrels, and other agriculture techniques have combined to reduce the number of suitable burrows. The use of chemical pesticides to control grasshoppers and other insects reduces an important food supply. When shortage of food forces the birds to forage far from their nesting sites, they become more susceptible to predation. Other factors that can contribute to the decline of this species include inclement weather, illegal shooting, and collisions with motor vehicles. They have difficulty finding burrows during migration since 99% of prairie dog colonies have been destroyed in the great plains. In winter, most of their habitat is cultivated and burrows may be in short supply.

#### Peregrine Falcon *anatum* Subspecies

The peregrine falcon (*Falco peregrinus anatum*) is of special status under SARA (Threatened), COSEWIC (Threatened), and in Manitoba (Endangered on the *Endangered Species Act* and S1B). The peregrine falcon *anatum* subspecies, also known as the American peregrine, breeds south of the treeline in Alaska and Canada, throughout most of the US, and from central to south Mexico. The northern birds winter from Mexico south to southern South America. This subspecies was extirpated from most of eastern Canada, southern Alberta, Manitoba and the interior of British Columbia (COSEWIC 2011).

The habitat requirements of the peregrine falcon are of three components: the nest site, nesting territory and home range. Nests are usually scrapes made on steep cliff ledges, usually near wetlands; sites may include artificial cliffs such as quarries and buildings. The nesting territory is the area defended around the nest to prevent other pairs from nesting, usually within 1 km or more, ensuring adequate food for all nesting pairs and their young; the density of nests tends to be related to food availability. The home range is the extended, non-defended area in which the peregrines hunt for additional food and which can extend to 27 km from the nest; peregrines prefer open habitats such as wetlands, tundra, savannah, sea coasts and mountain meadows, but will also hunt over open forest.

Peregrine falcons begin breeding in their second year. Although the average lifespan is 4-5 years, some birds have been known to live much longer. Clutch size varies from 2-5 eggs, increasing southwards. Re-nesting will occur in southern populations if the eggs are destroyed early in the incubation period. Peregrines are excellent hunters that feed almost entirely on birds, usually catching them in flight (COSEWIC 2011).

Precipitous declines in peregrine populations in North America were associated with the widespread, intensive use of persistent organochlorine compounds, particularly the pesticide DDT. These compounds cause egg-shell thinning, egg breakage, reduced hatching success, reduced brood-size and reduced breeding success. Since peregrine falcons are at the top of the food chain, their tissues accumulate a great deal of these substances. Current threats include the small population size and the diminishing

---

---

quality of habitat. Locally, peregrines may be affected by destruction of breeding sites and breeding areas, or by human intrusion near nest sites (COSEWIC 2011).

#### Least Bittern

The least bittern (*Ixobrychus exilis*) is of special status under SARA (Threatened), COSEWIC (Threatened) and in Manitoba (S3B). The least bittern is a relatively small member of the heron and bittern family that breeds from southern Canada south to South America, and winters from California, Texas and Florida to Panama and Colombia (COSEWIC 2009b).

In Canada, nesting occurs in the extreme south of Manitoba, south of the Canadian Shield in Ontario, in the extreme southwest of Quebec, in the extreme southwest of New Brunswick, and possibly occasionally in Nova Scotia. They nest in freshwater marshes, where dense tall aquatic vegetation is interspersed with clumps of woody vegetation and open water. They prefer marshes that exceed 5 ha in area. In the northern part of their range, they are most strongly associated with cattails (*Typha* spp.). The least bittern builds its nest on a clump of marsh vegetation barely above water level with clutch size varying from 2 to 6 (usually 4 or 5) bluish- or greenish-white eggs. It has been suggested that least bitterns can have two broods in one season (COSEWIC 2009b).

The Canadian population of least bitterns is estimated to be at less than 1,000 pairs. The main factor for the decline is loss of habitat due to the drainage of wetlands. Natural succession, the natural filling in of wetlands by woody vegetation, has also been a cause of habitat loss. Human disturbance during the nesting period is a second important limiting factor (COSEWIC 2009b).

#### Northern Prairie Skink

The northern prairie skink (*Eumeces septentrionalis*) is of special concern under SARA (Endangered), COSEWIC (Endangered) and in Manitoba (S2). In Canada, this small lizard is found only in southwestern Manitoba (Environment Canada 2011). The northern prairie skink inhabits sandy areas located close to a water source such as a river or a swamp. These skinks emerge from hibernation in April or early May. In Canada, breeding occurs during the last week of May and the first week of June. Females lay only one clutch a year (Environment Canada 2011).

Severe weather conditions may affect breeding and, thereby limit the populations of northern prairie skinks. Loss of habitat is an important limiting factor for the species (Environment Canada 2011).

#### Northern Leopard Frog

The northern leopard frog (*Rana pipiens*) is of special status under SARA (Special Concern), COSEWIC (Special Concern) and in Manitoba (S4). It has a range that encompasses most of the northern portion of the United States, extending into all provinces and the Northwest Territories in Canada. In Manitoba, the species was formerly abundant along the southern shores of Lake Winnipeg and Lake Manitoba, and less common up to Southern Indian Lake and east of Lake Winnipeg (COSEWIC 2009c).

The northern leopard frog uses a variety of habitats to meet its needs throughout the year. Separate sites are generally used for overwintering and breeding. Overwintering sites are well-oxygenated water bodies, such as streams or larger ponds that do not freeze solid; breeding sites are temporary ponds that often dry up in late summer. A typical breeding pond is 30-60 m in diameter, 1.5-2.0 m deep, located in an open area, with a lot of emergent vegetation, and no fish. In the summer, the frogs are found in a wide variety of habitats, but usually not in heavily treed areas, in grass that is more than 1 m tall, or in open sandy areas. The preferred habitat of the frogs seems to be vegetation 15-30 cm tall that is relatively close to water (COSEWIC 2009c).

Northern leopard frogs emerge from the ponds where they overwinter when the water temperature rises to 7-10°C. Each female mates only once, and lays a single egg mass in shallow water, usually on vegetation. The eggs hatch after about nine days; the tadpoles initially stay close to the egg mass, but

---

---

disperse after a few days. Free swimming tadpoles feed on floating vegetation and dead and decaying organic matter. It takes 60-90 days for tadpoles to mature and transform into frogs. In the fall, northern leopard frogs move to overwintering sites, choosing water over land when air temperatures fall below 2°C. They have been found up to 3 m below the ice hibernating in small circular excavations in the surface of the mud in ponds (COSEWIC 2009c).

### Monarch

The monarch (*Danaus plexippus*) is of special status under SARA (Special Concern), COSEWIC (Special Concern). The monarch is not considered of concern provincially in Manitoba (S5) (NatureServe 2011). This butterfly is widely distributed from Central America to southern Canada and from coast to coast. There are three populations of the monarch: western, central, and eastern. The eastern population of the monarch is the largest of the three, and includes all monarchs that occur east of the Rocky Mountains, from the Gulf coast to southern Canada, and from the great plain states and prairie provinces east to the Atlantic coast (Environment Canada 2011).

The eastern and western populations of the monarch annually migrate south, beginning in August and continuing until mid-October. The eastern monarch population overwinters annually at approximately 12 sites in the Transverse Neovolcanic Belt, a mountain range in central Mexico. In March and early April, the monarchs begin their migration north. They fly to the Gulf Coast where the females lay eggs, and it is these offspring that continue the migration back to the northern breeding range. It takes several generations of butterflies to reach the northern part of the range, each generation responding to the availability of milkweed plants (Environment Canada 2011).

Monarchs in Canada occur primarily wherever milkweed (*Asclepius spp.*) and other wildflowers (such as goldenrod, asters and purple loosestrife) exist. This includes abandoned farmland, along roadsides and other open spaces where these plants grow. The distribution of the monarch has gradually shifted eastward over the past century, due to a combination of clearing of deciduous forests and loss of habitat to agricultural development (Environment Canada 2011).

Environmental conditions and loss of breeding habitat pose threats to all monarchs. However, the eastern population of the monarch is limited by loss of habitat to logging, human disturbance and predation, especially while wintering in Mexico. Widespread and increasing use of herbicides in North America is another significant threat, which kills both the milkweed needed by the caterpillars and the nectar producing wildflowers needed by the adults (Environment Canada 2011).

### **5.1.11 Human Occupancy and Resource Use**

This subsection describes the current state of human occupancy and resource use in the vicinity of the proposed pipeline route in terms of population and demographics, development and land use planes, environmentally significant and protected areas, natural resource use, and surface dispositions. Potential impacts related to the construction of the proposed pipeline and mitigation pertaining to Human Occupancy and Resource Use are discussed in Section 6.2.11 of this EA.

#### **5.1.11.1 Population and Demographics**

Few communities are found in the vicinity of the proposed pipeline route, ranging from towns and villages to unincorporated settlements. Tables 5.11 of this EA present a list of communities in the vicinity of the route. Only the main communities potentially affected by the construction of the pipeline are provided in this table. The proposed route traverses two Rural Municipalities (RMs): the RM of Pipestone and the RM of Wallace.

**TABLE 5.11**  
**COMMUNITIES IN THE VICINITY OF THE PROPOSED PIPELINE ROUTE**

Community	Population	Distance to Proposed Route
Virden	3,010	23 km east
RM Pipestone - Reston	1,419	25 km southeast
Elkhorn	1,501	15 km north

#### *5.1.11.3 Environmentally Significant and Protected Areas*

The proposed pipeline route does not encounter any lands under Parks Canada jurisdiction, Conservation Areas, proposed or existing provincial parks, Ecological Reserves, Provincial Forests, recreation areas, Conservation Lands, Resource Management Areas or Special Conservation Areas (Manitoba Agriculture, Food and Rural Initiatives 2011).

#### *5.1.11.4 Natural Resource Use*

The entire proposed pipeline route traverses privately-owned agricultural lands and is located in Mineral Exploitation Zone A. The proposed pipeline route does not traverse any coal dispositions, mining claims, potash licenses, quarry leases or withdrawals, or mining restricted lands (Manitoba Industry, Economic Development and Mines 2006).

The CLI (1971) has rated most of the lands along the proposed route as ranging from having moderately low (Class 5) to low (Class 6) capability for outdoor recreation.

The proposed pipeline route is located in FMU 6 and does not traverse any Forest Management Licenses or Integrated Wood Supply Areas (Manitoba Agriculture, Food and Rural Initiatives 2011). No community pastures or grazing leases are traversed by the proposed pipeline route (Manitoba Agriculture, Food and Rural Initiatives 2011).

The proposed pipeline route traverses Game Hunting Area (GHA) No. 27. The big game hunting season for moose in GHA 27 extends from mid September to mid-October, and a short period in early December. The proposed route lies within Deer Hunting Zone E. The white-tailed deer hunting season in Zone E extends from late August to early December (Manitoba Conservation 2011).

The proposed route lies within Game Bird Hunting Zone (GBHZ) 4. The game bird hunting season extends from early September to late November for ducks, coots and snipe as well as geese, and from early September to late November for sandhill cranes. Upland game bird hunting seasons begin in early September and extend to mid-December for grouse and gray (Hungarian) partridge. The wild turkey hunting season extends from late April to late May and early to mid-October (Manitoba Conservation 2011).

The proposed pipeline route traverses Open Area Zone 1 trapping area (Manitoba Conservation 2011). Trapping in this Open Trapline District requires a Manitoba Trapper's Licence which allows a person to trap anywhere in the Open Area, with permission from the landowner. Furbearer species of interest for trapping in Open Area Zone 1 include fisher, marten, muskrat and raccoon. There are no registered traplines located along the proposed pipeline route (Manitoba Industry, Economic Development and Mines 2011). Outfitters within Manitoba are not assigned geographical areas and need permission from the landowner on private lands. Outfitting may occur in the Oak Lake area and on private lands along the proposed route. The proposed pipeline route lies within the Southern Fishing Division where the fishing season is open from May 14 until March 31 (Manitoba Conservation 2011). Information on downstream water users along the proposed pipeline route is presented in Section 5.1.3 of this EA.



#### **5.1.11.5 Surface Dispositions**

The entire proposed pipeline route traverses privately-owned agricultural lands. The proposed pipeline route does not traverse any provincial or federal Crown lands (Manitoba Industry, Economic Development and Mines 2011).

#### **5.1.12 Heritage Resources**

This subsection describes the known heritage resources (e.g., archaeological sites, palaeontological potential areas) along proposed pipeline route. Potential impacts related to the construction of the proposed pipeline and mitigation pertaining to Heritage Resources are discussed in Section 6.2.12 of this EA.

##### **5.1.12.1 Archaeological Overview**

In order to identify potential conflicts with archaeological sites, a file search of the site inventory records held by the Historic Resource Branch of Manitoba Culture, Heritage, Tourism and Sport (MB CHTS) was conducted. Archaeological Site Inventory Data forms obtained from the file search were consulted with regard to a site's proximity to the present developments, site type, artifacts collected/observed, previous disturbance and the site recommendations of the Permit Holder.

The records showed no previously recorded sites within the Regional Study Area (RSA), here defined as the file search area: Townships 09 to 10, Range 28, West of the Principal Meridian.

##### **1.1.1 Archaeological Site Potential and Recommendations**

The majority of the proposed pipeline crosses cultivated lands. Review of the archaeological site inventory and experience in the region indicates there is low potential for intact archaeological components. An Archaeological Overview is included in Appendix 5C.

Based on the above, a historical resources impact assessment will not be conducted for the proposed Provident Pipeline Project.

#### **5.1.13 Traditional Land and Resource Use**

Since all of the proposed route traverses patented lands presently used for agricultural purposes, the use of lands along the route by Aboriginal groups for traditional purposes is limited. The nearest First Nations community is Oak Lake, approximately 28 km southeast of the proposed pipeline route.

Provident has therefore not initiated consultation with Aboriginal groups to determine interest with regard to the proposed Project and the need for traditional land use studies.

#### **5.1.14 Social and Cultural Well-being**

This subsection presents information on the social and cultural well-being related to an influx of workers during the construction phase of the proposed pipeline. Potential effects related to the construction of the proposed pipeline are presented in Section 6.2.14 of this EA. Information related to social and cultural well-being is found throughout Section 5.0 of this EA. Specifically, information on predominant cultural groups is found in Section 5.1.12 and Section 5.1.13 of this EA. Demographic features of the local population and workforce are located in Section 5.1.11 and Section 5.1.17 of this EA.

The unincorporated center of Reston is located approximately 25 km southeast of the proposed pipeline route. No detailed statistics are available for this community from Statistics Canada. Reston is located within the RM of Pipestone No. 162. In 2006, the total population of the RM of Pipestone was reported as

1,419. In 2006, approximately 29% of the RM of Pipestone population was between 45 and 64 years old, which represents the largest age demographic. The median age of the population was 46 years. The RM of Pipestone had a workforce of 825 people in 2006. The main industries include agriculture, retail trade, health care and social services, construction, manufacturing, transport and warehousing and accommodation and food services (Manitoba Bureau of Statistics, 2008).

The town of Virden is located approximately 23 km east of the proposed pipeline route in the RM of Wallace No. 199. In 2006, the total population of Virden was reported as 3,010. In 2006, approximately 27% of the Virden population was between 20 and 44 years old, which represents the largest age demographic. The median age of the population was 45 years. Virden had a workforce of 1,485 people in 2006. The main industries include accommodation and food services, retail trade, education services, health care and social services, transport and warehousing, mining & oil and gas extraction, and construction (Manitoba Bureau of Statistics, 2008).

### **5.1.15 Human Health**

This subsection identifies the location of potential receptors of nuisance air and noise emissions that could potentially be sources of adverse human health effects during the construction and operational phases of the proposed pipeline. Potential impacts arising from the construction and operation of the proposed pipeline, and mitigation pertaining to Human Health are discussed in Section 6.2.15 of this EA. Information related to water quality, air quality, and acoustic environment is presented in Sections 5.1.3, 5.1.4 and 5.1.5 of this EA.

### **5.1.16 Infrastructure and Services**

This subsection identifies infrastructure and services in the vicinity of the proposed pipeline route. Potential effects on infrastructure and services arising from the construction of the proposed pipeline are presented in Section 6.2.16 of this EA.

#### **5.1.16.1 Transportation and Transmission**

The proposed pipeline route crosses four secondary highways (Table 5.12 of this EA). Networks of primary and secondary highways, as well as local and municipal roads, provide access throughout the rural areas in the vicinity of the proposed route.

**TABLE 5.12  
TRANSPORTATION INFRASTRUCTURE CROSSED BY THE PROPOSED PIPELINE ROUTE**

<b>Transportation Infrastructure</b>	<b>Legal Location</b>	<b>Plan</b>	<b>Xing #</b>
Medium grade gravel road – 56N	Between NE 7 & SE 18-10-28 WPM	C1	5
Medium grade gravel road – 54N	Between NE 31-09-28 WPM & SE 06-10-28 WPM	C1	18
Medium grade gravel road – 53N	Between NE 30 & SE 31-09-28 WPM	C2	8
Medium grade gravel road – 52N	Between NE 19 & SE 30-09-28 WPM	C2	11

Commercial air passenger and air freight services are provided by a number of Canadian and US carriers at the Winnipeg International Airport. Information on transportation services available in the pipeline route area are presented in Table 5.97 of this EA.

#### **5.1.16.3 Waste Management**

Waste disposal facilities along the proposed pipeline route are presented in Table 5.13 of this EA. Most landfills only accept wastes generated within their respective Rural Municipality. The nearest hazardous

waste disposal site in Manitoba is in Letellier, approximately 75 km south of Winnipeg (Province of Manitoba 2011).

**TABLE 5.13**  
**WASTE DISPOSAL GROUNDS LOCATED ALONG THE PROPOSED PIPELINE ROUTE**

Site Name	Legal Location	Type of Waste
Reston Waste Disposal Grounds	NW 04-07-27 WPM	Accepts construction waste <sup>1</sup>
Virден Waste Disposal Grounds	SE 24-11-26 WPM	Accepts construction waste but metals should be separated from other waste <sup>2</sup>

### **5.1.17 Employment and Economy**

This subsection describes local and regional economic and employment in communities in the vicinity of the proposed pipeline route. Potential impacts on employment and economy arising from the construction and operation of the proposed pipeline route, and mitigation pertaining to employment and economy are discussed in Section 6.2.17 of this EA.

#### **5.1.17.1 Existing Local and Regional Employment**

The town of Virден had a workforce of 1,485 people in 2006. The proportion of the Virден's labour force that is skilled was lower than in Manitoba as a whole. The percentage of individuals between the ages of 25 and 64 years of age with a trade, post-secondary certificate or diploma or university degree during the 2006 census was 49% compared to 56% in Manitoba. Most employed individuals in Virден work in sales and service (31%), while the remaining work in trades, transportation and as equipment operators (18%); business/finance and administration (16%); social science/education/government/religion (11%); management (10%) and primary industry (9%). The employment and unemployment rates for Virден were reported by the Manitoba Bureau of Statistics at 61.6% and 5.1% respectively, compared to 67.3% and 5.5% for Manitoba as a whole. The median total annual income of individuals over age 15 in Virден was reported to be \$24,329 and the median household income was reported to be ~\$48,000 (Manitoba Bureau of Statistics 2008).

The village of Elkhorn had a workforce of 185 people in 2006. The proportion of the Virден's labour force that is skilled was lower than in Manitoba as a whole. The percentage of individuals between the ages of 25 and 64 years of age with a trade, post-secondary certificate or diploma or university degree during the 2006 census was 49% compared to 56% in Manitoba. Most employed individuals in Elkhorn work in sales and service (24%), while the remaining work in trades, transportation and as equipment operators (16%); business/finance and administration (16%); management (12%); social science, education, government service and religion (12%) and primary industry (12%). The employment and unemployment rates for Virден were reported by the Manitoba Bureau of Statistics at 50.7% and 0% respectively, compared to 67.3% and 5.5% for Manitoba as a whole. The median total annual income of individuals over age 15 in Virден was reported to be \$17,607 and the median household income was reported to be ~\$30,000 (Manitoba Bureau of Statistics 2008).

The RM of Pipestone had a workforce of 825 people in 2006. The proportion of the RM of Pipestone's labour force that is skilled was lower than in Manitoba as a whole. The percentage of individuals between the ages of 25 and 64 years of age with a trade, post-secondary certificate or diploma or university degree during the 2006 census was 41% compared to 56% in Manitoba. Most employed individuals in the RM of Pipestone work in primary industry (38%), while the remaining work in sales and service (20%); trades, transportation and as equipment operators (19%); business/finance and administration (12%); management (4%) and health care (4%). The employment and unemployment rates for the RM of Pipestone were reported by the Manitoba Bureau of Statistics at 71.4% and 3.0% respectively, compared to 67.3% and 5.5% for Manitoba as a whole. The median total annual income of individuals over age 15

---

---

in the RM of Pipestone was reported to be \$17,300 and the median household income was reported to be ~\$40,000 (Manitoba Bureau of Statistics 2008).

The RM of Wallace had a workforce of 925 people in 2006. The proportion of the RM of Wallace's labour force that is skilled was lower than in Manitoba as a whole. The percentage of individuals between the ages of 25 and 64 years of age with a trade, post-secondary certificate or diploma or university degree during the 2006 census was 38% compared to 56% in Manitoba. Most employed individuals in the RM of Pipestone work in primary industry (41%), while the remaining work in sales and service (20%); trades, transportation and as equipment operators (15%); business/finance and administration (10%); management (5%); social science, education, government service and religion (5%) and health care (4%). The employment and unemployment rates for the RM of Pipestone were reported by the Manitoba Bureau of Statistics at 80.4% and 2.7% respectively, compared to 67.3% and 5.5% for Manitoba as a whole. The median total annual income of individuals over age 15 in the RM of Wallace was reported to be \$19,672 and the median household income was reported to be ~\$45,000 (Manitoba Bureau of Statistics 2008).

The city of Brandon had a workforce of 23,200 people in 2006. The proportion of Brandon's labour force that is skilled was higher than in Manitoba as a whole. The percentage of individuals between the ages of 20 and 64 years of age with a trade, post-secondary certificate or diploma or university degree during the 2001 census was 57% compared to 56% in Manitoba. Most employed individuals in Brandon work in sales and services (30%), while 15% work in business, finance and administration; and 15% are employed in trades, transport and equipment operations. The employment and unemployment rates for Brandon were reported by Statistics Canada at 68.9% and 5.5% respectively, compared to 63.3% and 6.1% for Manitoba as a whole. The median total annual income of individuals over age 15 in Brandon was reported to be \$24,774 and the median household income was reported to be ~\$45,000 (Manitoba Bureau of Statistics 2008).

#### *5.1.17.2 Local Employment Development Plans*

There are no employment development plans for any of the RMs along the proposed pipeline route.

#### *5.1.17.3 Anticipated Levels of Local and Regional Economic Participation*

Local businesses are anticipated to participate to some degree in the construction of the pipeline by providing various goods and services required for the construction of the pipeline. However, communities within the LSA of the proposed pipeline route are relatively small and are not expected to have the capacity to provide some of the highly specialized skills required for pipeline construction. Therefore, there is likely to be an influx of skilled workers from the RSA (including larger communities such as Brandon and Regina) as well as other parts of Manitoba.

APPENDIX 5A  
PHOTOPLATES OF THE PROPOSED PIPELINE ROUTE

APPENDIX 5B  
RARE PLANT SPECIES AND PLANT COMMUNITIES AND RARE WILDLIFE SPECIES WITH  
POTENTIAL TO OCCUR IN THE PROJECT AREA

**TABLE 5B-1 POTENTIAL RARE VASCULAR PLANT SPECIES IN THE ASPEN PARKLAND ECOREGION OF MANITOBA**

Scientific Name	Common Name	Preferred Habitat	Provincial Rank <sub>1</sub>	Additional Designations
<i>Achnatherum hymenoides</i> ( <i>Oryzopsis hymenoides</i> )	Indian rice grass	dry prairies and sand hills	S2	---
<i>Agalinis aspera</i>	rough purple agalinis	gravelly loam	S1S2	Endangered <sub>3</sub>
<i>Alisma gramineum</i>	narrow-leaved waterplantain	shallow water and mud shores	S1	---
<i>Andropogon hallii</i>	sand bluestem	dry prairies and sand hills	S2	---
<i>Arnica fulgens</i>	shining arnica	moist meadows and gravelly prairies	S2	---
<i>Artemisia cana</i>	silver sagebrush, hoary sagebrush	deep loam and sandy soils on floodplains, uplands and rocky open sites	S2	---
<i>Asarum canadense</i>	wild ginger	rich upland aspen, balsam poplar and elm woods, often calcareous	S3?	---
<i>Asclepias lanuginosa</i>	hairy milkweed	sandhills	S1	---
<i>Asclepias verticillata</i>	whorled milkweed	dry open woods and slopes	S2	---
<i>Asclepias viridiflora</i>	green milkweed	dry hillsides	S3	---
<i>Astragalus gilviflorus</i>	cushion milkvetch	dry prairies	S1	---
<i>Astragalus pectinatus</i>	narrow-leaved milkvetch	arid grasslands	S2S3	---
<i>Atriplex argentea</i>	saltbrush, silvery atriplex	alkaline soils	S2	---
<i>Bidens amplissima</i>	beggar-ticks	moist edges of pond or lakes	SNA	---
<i>Boltonia asteroides</i> var. <i>recognita</i>	white boltonia	shores	S2S3	G5T3T5 <sub>2</sub>
<i>Botrychium multifidum</i>	leathery grape-fern	acid sandy grasslands and fields	S3	---
<i>Bouteloua curtipendula</i>	side-oats grama	dry prairies	S2	---
<i>Bromus porteri</i>	Porter's chess	woodlands	S3?	---
<i>Bromus pubescens</i>	Canada brome grass	moist streambanks, meadows, riparian thickets and forests	SNA	---
<i>Buchloë dactyloides</i>	buffalo grass	dry prairies	S1	Threatened <sub>3,4</sub>
<i>Calamagrostis montanensis</i>	plains reed	grass dry grasslands	S3	---
<i>Callitriche heterophylla</i>	larger water-starwort	wetlands	S2	---
<i>Carex bicknellii</i>	Bicknell's sedge	dry prairies, barren rocky areas	SH	---
<i>Carex cryptolepis</i> northeastern	sedge	moist areas around streams, ponds and lakes	S1	---
<i>Carex gravida</i>	heavy sedge	calcareous soils in open forests and prairies	S1	---
<i>Carex hallii</i>	Hall's sedge	wet meadows	S3	---
<i>Carex hystericina</i>	porcupine sedge	marshes and wetlands	S3?	---
<i>Carex parryana</i>	Parry's sedge	moist areas around streams, ponds and lakes	S3?	---
<i>Carex prairea</i>	prairie sedge	moist wetland soils	S4?	--- <sub>2</sub>
<i>Carex sterilis</i> dioecious	sedge	fens, openings in swamps, lake and river shores, wet calcareous areas	S2	---
<i>Carex supina</i> var. <i>spaniocarpa</i>	weak sedge	moist areas around streams, ponds and lakes	S2?	G5T3T5 <sub>2</sub>
<i>Carex tetanica</i>	rigid sedge	dry calcareous woods	S2	---
<i>Carex torreyi</i>	Torrey's sedge	moist meadows and thickets	S4	---
<i>Carex tribuloides</i>	prickly sedge	wet woodlands and moist meadows	SNA	---
<i>Carex xerantica</i>	white-scaled sedge	grasslands and openings in dry forests	S3?	---
<i>Celtis occidentalis</i>	hackberry, nettle-tree	well drained sand and gravel beach ridges	S1	---
<i>Chenopodium subglabrum</i>	smooth goosefoot	active sand dunes	S1	G3G4 <sub>2</sub> , Threatened <sub>3</sub>

Scientific Name	Common Name	Preferred Habitat	Provincial Rank <sub>1</sub>	Additional Designations
<i>Clematis ligusticifolia</i>	western virgin's-bower	moist places in arid areas	S1	---
<i>Coreopsis tinctoria</i>	common tickseed	grassy clearings	SH	---
<i>Cornus alternifolia</i>	alternate-leaved dogwood	forest margins and understory	S3	---
<i>Cryptotaenia canadensis</i>	honestwort	rich damp woods	S2	---
<i>Cycloloma atriplicifolium</i>	winged pigweed	sandy sites	S2	---
<i>Cymopterus acaulis</i>	plains cymopterus	marshy ground	S2S3	---
<i>Cyperus schweinitzii</i>	Schweinitz's flatsedge	dry sandy soil and active dunes	S2	---
<i>Cypripedium candidum</i>	small white lady's-slipper	calcareous prairie openings in wooded grasslands and open south facing slopes	S1	Endangered <sub>3,4,5</sub>
<i>Dalea villosa</i> var. <i>villosa</i>	silky prairie-clover	dry, sandy prairie sites	S2	Threatened <sub>3,4</sub>
<i>Desmodium canadense</i>	beggar's-lice	moist open forests and edges	S2	---
<i>Drosera anglica</i>	oblong-leaved sundew	swamps and bogs	S3	---
<i>Eleocharis engelmannii</i>	Engelmann's spike-rush	wet muddy places	S1	---
<i>Elymus hystrix</i>	bottle-brush grass	rich moist woods	S2	---
<i>Eragrostis hypnoides</i>	creeping teal love grass	wetlands	S4	---
<i>Erigeron caespitosus</i>	tufted fleabane	sandy hillsides and prairies	S2	---
<i>Escoba vivipara</i> ( <i>Coryphantha vivipara</i> )	pincushion cactus	dry plains and sandhills	S2	---
<i>Festuca hallii</i>	plains rough fescue	dry grassland	S3	---
<i>Galium aparine</i>	cleavers, goosegrass	moist woods	SU	---
<i>Hackelia floribunda</i>	large flowered stickseed	rocky slopes, grasslands and shrub lands	SU	---
<i>Helianthus nuttallii</i> ssp. <i>rydbergii</i>	tuberous-rooted sunflower	dry silty and sandy sites	S2	---
<i>Heliotropium curassavicum</i>	seaside heliotrope	alkaline shores	SH	---
<i>Hypoxis hirsuta</i>	yellow stargrass	wet to dry woodlands and prairies	S3	---
<i>Juncus interior</i>	inland rush	moist prairies, marshy sites and forest edges	S1	---
<i>Krascheninnikovia lanata</i> ( <i>Eurotia lanata</i> )	winterfat	prairies and foothills	S2	---
<i>Leersia oryzoides</i>	rice cutgrass	marshes and lowlands around rivers	S3?	---
<i>Lemna turionifera</i>	duckweed	ponds and marshes	SU	---
<i>Lomatium macrocarpum</i>	long-fruited parsley	dry open hillsides	S3	---
<i>Lomatium orientale</i>	white-flowered parsley	dry plains and bluffs	S1	---
<i>Lomatogonium rotatum</i>	marsh felwort	wet alkaline soil	S2S3	---
<i>Lotus purshianus</i>	prairie trefoil	roadsides, open dry disturbed areas	S2S3	---
<i>Malaxis brachypoda</i>	white adder's	moist damp woods and bogs	S2?	---
<i>Malaxis paludosa</i>	bog adder's-mouth	wet sphagnum bogs	S1	---
<i>Mentzelia decapetala</i>	gumbo-lily	bare, wind eroded soil	SH	---
<i>Mertensia lanceolata</i>	tall lungwort	steppes	S2	---
<i>Mimulus glabratus</i>	smooth monkeyflower	shady boggy springs	S1	---
<i>Mimulus glabratus</i> var. <i>jamesii</i>	smooth monkeyflower	wet lime rich soils	S1	---
<i>Musineon divaricatum</i>	leafy musineon	dry hillsides	S2	---
<i>Myosurus minimus</i> ssp. <i>minimus</i>	least mousetail	calcareous and alkaline soils	S1	---
<i>Nassella viridula</i> ( <i>Stipa viridula</i> )	green needle	grass dry prairie grassland	S3	---
<i>Orobanche ludoviciana</i>	Louisiana broom-rape	dry hills and sand dunes	S2	---
<i>Osmorhiza claytonii</i>	woolly or hairy sweet cicely	deciduous woods	S2	---
<i>Ostrya virginiana</i>	hop-hornbeam	rich woods	S2	---
<i>Parietaria pensylvanica</i>	American pellitory	shaded gravelly places and disturbed areas	S4	---
<i>Penstemon nitidus</i>	smooth blue beard-tongue	sandy or gravelly prairies	S2	---
<i>Penstemon procerus</i>	slender beard-tongue	moist prairies	S1?	---
<i>Phryma leptostachya</i>	lopseed rich	woods, slopes, ravines moist thickets	S3	---
<i>Plagiobothrys scouleri</i> var. <i>scouleri</i>	Scouler's allocarya	wetlands and moist areas	S1	G5TNR <sub>2</sub>
<i>Plantago elongata</i> ssp.	linear leaved-plantain	wetlands	S2	---



Scientific Name	Common Name	Preferred Habitat	Provincial Rank <sub>1</sub>	Additional Designations
<i>elongate</i>				
<i>Piptatherum micranthum</i> ( <i>Oryzopsis micrantha</i> )	little-seed rice grass	open woods or rocky ridges or slopes	S2	---
<i>Platanthera orbiculata</i>	round-leaved bog orchid	woods	S3	---
<i>Poa arida</i>	plains bluegrass	dry grasslands	S4	---
<i>Poa cusickii</i>	mutton grass	dry prairie and sand hills	S2?	---
<i>Poa fendleriana</i>	mutton grass	open prairie	S2	---
<i>Polanisia dodecandra</i> ssp. <i>dodecandra</i>	clammyweed	sandy or gravelly soil	S1	---
<i>Polanisia dodecandra</i> ssp. <i>trachysperma</i>	clammyweed	sandy or gravelly soil, often on disturbed or eroding sites	S1	---
<i>Polygala verticillata</i>	whorled milkwort	prairie and dry hills	S2	---
<i>Polygala verticillata</i> var. <i>isocycla</i>	whorled milkwort	prairie and dry hills	S2	---
<i>Potamogeton amplifolius</i>	large-leaved pondweed	lakes and streams	S2?	---
<i>Potamogeton illinoenses</i>	Illinois pondweed	lakes and streams	S2?	---
<i>Potentilla flabelliformis</i> ( <i>P. gracilis</i> var. <i>flabelliformis</i> )	graceful cinquefoil	meadows and prairies	S1	---
<i>Potentilla plattensis</i>	low cinquefoil	moist meadows and prairies	S2	---
<i>Ranunculus cymbalaria</i> var. <i>saximontanus</i>	seaside crowfoot	lake and stream edges	S1S2	---
<i>Rhynchospora capillacea</i>	horned beakrush	bogs	S2	---
<i>Salix brachycarpa</i>	short-capsuled willow	coastal tundra and estuaries	S3	---
<i>Sanguinaria canadensis</i>	blood-root rich	woods	S2	---
<i>Schedonnardus paniculatus</i>	tumble-grass	plains and dry alkaline prairies	S2	---
<i>Sisyrinchium campestre</i>	white-eyed grass	prairies, meadows and roadsides	SU	---
<i>Sporobolus neglectus</i>	annual dropseed	dry sandy soils	S3?	---
<i>Thermopsis rhombifolia</i>	golden bean	dry prairies	S2	---
<i>Townsendia exscapa</i>	silky townsend-daisy	sandhills	S2	---
<i>Tradescantia occidentalis</i>	western spiderwort	in sandy soils on open to partially stabilized dune systems	S1	Threatened <sub>3,4,5</sub>
<i>Uvularia sessilifolia</i>	small bellwort	rich woods and thickets	S2	---
<i>Verbena bracteata</i>	bracted vervain	sandy prairie, roadsides	N/A yes S3 ---	

**Sources: After TERA (2007)**

**Notes:**

- Provincial (S) ranks are based solely on the species' status within the province, and range from 1 (5 or fewer occurrences) to 5 (demonstrably secure under present conditions) (NatureServe 2011).

S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).

S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).

S3 = Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.

S4 = Apparently Secure: uncommon but not rare, and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.

S5 = Secure: common, widespread, and abundant in the province. Essentially ineradicable under present conditions. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

S#S# = Range Rank: a numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element.

Q = Questionable taxonomy: taxonomic status is questionable; numeric rank may change with taxonomy.

T = Designates a rank associated with a subspecies.

NA = Not Applicable: a conservation status is not applicable because the species is not a suitable target for conservation activities.

H = Historical occurrence; usually not verified in the last 20 years, but with some expectation that it may be rediscovered.

U = Unrankable: currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

? = Inexact numeric rank: denotes inexact numeric rank.
- Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (5 or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed (NatureServe 2011).
- COSEWIC (2011). Species listed as 'Extirpated', 'Not at Risk' or 'Data Deficient' were generally not included in the table without other noteworthy factors being present.

**Endangered:** A species facing imminent extirpation or extinction.

**Threatened:** A species likely to become endangered if limiting factors are not reversed.

4. SARA. The *Act* establishes Schedule 1 as the list of species to be protected on all federal lands in Canada.  
**Endangered:** a species that is facing imminent extirpation or extinction.  
**Threatened:** a species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.
5. Manitoba *Endangered Species Act*  
**Endangered:** any native Manitoba species that is threatened to disappear throughout all or most of its Manitoba range.  
**Threatened:** any native Manitoba species likely to become endangered or at risk due to low or declining numbers in Manitoba if the factors affecting it do not improve.
6. N/A - Indicates that range information for this species or subspecies/variety, in this province, is not available.

**TABLE 5B-2 POTENTIAL RARE PLANT COMMUNITIES FOR THE ASPEN PARKLAND ECOREGION TRAVERSED BY THE PROPOSED PROJECT**

Scientific Name	Common Name	Provincial Rank <sub>1</sub>	Global Rank <sub>2</sub>
<i>Andropogon scoparius</i> ( <i>Schizachyrium scoparium</i> )- <i>Bouteloua</i> spp. ( <i>Curtipendula, gracilis</i> )- <i>Carex filifolia</i> herbaceous vegetation	little bluestem-grama grass (blue, sideoats)-thread-leaved sedge herbaceous vegetation	S3	GNR
<i>Fraxinus pennsylvanica</i> -( <i>Ulmus Americana</i> )- <i>Acer negundo</i> forest	green ash-(American elm)-Manitoba maple forest	S3	GNR
<i>Juniperus horizontalis</i> / <i>Andropogon scoparius</i> ( <i>Schizachyrium scoparium</i> ) dwarf-shrubland	creeping juniper/little bluestem dwarf shrubland	S3?	GNR
<i>Quercus macrocarpa</i> / <i>Amelanchier alnifolia</i> / <i>Aralia nudicaulis</i> - <i>Carex assiniboensis</i> forest	bur oak/Saskatoon serviceberry /sarsaparilla-assiniboia sedge forest	S3?	GNR
<i>Stipa comata</i> - <i>Bouteloua gracilis</i> - <i>Carex filifolia</i> herbaceous vegetation	needle-and-thread - blue grama – threadleaved sedge herbaceous vegetation	S3	GNR

**TABLE 5B-3 POTENTIAL RARE WILDLIFE SPECIES IN THE ASPEN PARKLAND ECOREGION TRAVERSED BY THE PROPOSED PIPELINE IN MANITOBA**

Scientific Name	Common Name	Preferred Habitat	Provincial Rank <sub>1</sub>	Additional Designations
<b>MAMMALS</b>				
<i>Odocoileus hemionus</i>	mule or black-tailed deer	Open coniferous forests, subclimax brush, aspen parklands, steep broken terrain, and river valleys.	S3 <sub>2</sub>	Threatened <sub>6</sub>
<i>Onychomys leucogaster</i>	northern grasshopper mouse	Open grasslands interspersed with sagebrush.	S3 <sub>1</sub>	---
<i>Perognathus fasciatus</i>	olive-backed pocket mouse	Open grasslands; sandy soil.	S3 <sub>1</sub>	---
<i>Sorex haydeni</i>	Hayden's prairie shrew	Dense vegetation, shrubby areas and meadows.	S3S4 <sub>1</sub>	---
<i>Sylvilagus floridanus</i>	Eastern cottontail	Meadows, orchards, fence rows and weedy/shrubby areas near woodlots.	S3 <sub>1</sub>	---
<i>Taxidea taxus</i>	badger	Open prairies, farm land and parkland, not forests.	S3S4 <sub>1</sub>	---
<b>BIRDS</b>				
<i>Accipiter cooperii</i>	Cooper's hawk	Aspen groves, parkland woodlots; wooded coulees and riparian forests of grasslands.	S4B, S2M, S2N <sub>1</sub> , S4B <sub>2</sub>	---
<i>Aechmophorus clarkii</i>	Clark's grebe	Larger lakes with emergent vegetation.	S1B <sub>1</sub>	---
<i>Ammodramus bairdii</i>	Baird's sparrow	Dry grassy, shrubby fields.	S2S3B <sub>2</sub>	Endangered <sub>6</sub>
<i>Ammodramus savannarum</i>	grasshopper sparrow	Hayfields and prairies.	S2S3B <sub>2</sub>	---
<i>Anthus spragueii</i>	Sprague's pipit	Native grassland.	S2S3B <sub>2</sub>	Threatened <sub>4,5</sub>
<i>Ardea herodias</i>	great blue heron	Open shallow water, edges of bays, streams, river margins, sloughs, lakes, ponds, ditches, mud flats, and marshes, nests on deciduous, coniferous and mixed wood land sometimes at considerable distances from water.	S3B <sub>1</sub>	Special Concern <sub>4</sub>
<i>Athene cunicularia</i>	burrowing owl	Dry, open short-grass country.	S1B <sub>2</sub> , S2B <sub>1</sub>	Endangered <sub>4,5,6,7</sub>
<i>Buteo regalis</i>	ferruginous hawk	Open, arid habitats dominated by grasses or sagebrush. It requires an elevated nest site.	S2B <sub>2</sub> , S4B, S4M <sub>1</sub>	Special Concern <sub>4</sub> , Threatened <sub>6</sub>
<i>Caprimulgus vociferus</i>	whip-poor-will	Ungrazed mixed, deciduous or open coniferous woods.	S3B <sub>1</sub>	---
<i>Cathartes aura</i>	turkey vulture	Various types of terrain, except heavy unbroken	S3B, S2M, S2N <sub>1</sub>	---

Scientific Name	Common Name	Preferred Habitat	Provincial Rank <sub>1</sub>	Additional Designations
		forest.		
<i>Chaetura pelagica</i>	chimney swift	Open water or land.	S3B <sub>1</sub>	---
<i>Charadrius alexandrinus</i>	snowy plover	Flat sandy beaches, salt flats and sandy areas with little vegetation.	S1B <sub>1</sub>	---
<i>Charadrius melodus circumcinctus</i>	piping plover <i>Circumcinctus</i> subspecies	Nest on gravel shores of shallow, saline lakes and on sandy shores of larger prairie lakes. Seeps also provide important foraging habitat on the Prairies.	S2B <sub>2</sub> , S3B <sub>1</sub>	G3 <sub>3</sub> , Endangered <sub>4,5,6,7</sub>
<i>Charadrius montanus</i>	mountain plover	Heavily grazed or recently burned mixed grassland in flat upland areas.	S1B <sub>1</sub>	G2 <sub>3</sub> , Endangered <sub>4,5</sub>
<i>Charadrius semipalmatus</i>	semipalmated plover	Mudflats, sandy or muddy beaches, flat open margins of ponds, lakes and rivers.	S1B, S5M <sub>1</sub>	---
<i>Chlidonias niger</i>	black tern	Watery marshes, lakes, ponds, sloughs, and rivers in either treeless or wooded country.	S3S4B <sub>2</sub>	---
<i>Coturnicops noveboracensis</i>	yellow rail	Marshes, damp fields, meadows and on the floodplains of rivers and streams.	S3B, S2M <sub>1</sub>	Special Concern <sub>4,5</sub>
<i>Cygnus buccinator</i>	trumpeter swan	Small to medium-sized shallow, isolated lakes with well developed emergent and submergent plant communities.	S1B <sub>1</sub>	---
<i>Cygnus columbianus</i>	tundra swan	Migratory species.	S5M <sub>1</sub>	---
<i>Dendroica caerulescens</i>	black-throated blue warbler	Deciduous and mixedwood with shrub or sapling understory, old clearings and logged areas.	S2B <sub>1</sub>	---
<i>Egretta thula</i>	snowy egret	Larger waterbodies.	S1B <sub>1</sub>	---
<i>Falco mexicanus</i>	prairie falcon	Canyons and coulees of the badlands; cliffs of river valleys.	S3B, S3M, S3N <sub>1</sub>	---
<i>Falco peregrinus anatum</i>	peregrine falcon <i>Anatum</i> subspecies	Nest on cliff ledges on steep cliffs, usually near wetlands. Prefer open habitats such as wetlands, tundra, savannah, sea coasts and mountain meadows, but will also hunt over open forest.	S1B, S4M, S2N <sub>1</sub>	Threatened <sub>4,5</sub> , Endangered <sub>6</sub>
<i>Gavia stellata</i>	red-throated loon	Freshwater ponds and lakes in forested areas.	S1B <sub>1</sub>	---
<i>Grus americana</i>	whooping crane	Open marshy areas.	SXB, S1M <sub>1</sub>	G1 <sub>3</sub> , Endangered <sub>4,5,6,7</sub>
<i>Haliaeetus leucocephalus</i>	bald eagle	Common breeder in north Saskatchewan, uncommon breeder and transient in south Saskatchewan; uses uplands and open water in winter.	S5C, S4M, S4N <sub>1</sub>	---
<i>Lanius excubitor</i>	Northern shrike	Open woods, shrubby swamps, open grasslands with fence posts and scattered trees.	S1B, S4M <sub>1</sub>	---
<i>Lanius ludovicianus excubitorides</i>	loggerhead shrike <i>Excubitorides</i> subspecies	Open country with trees, shrubs, poles or post for lookout and nesting.	S3S4B <sub>2</sub> , S4B <sub>1</sub>	Threatened <sub>4,5</sub> , Endangered <sub>6</sub>
<i>Limnodromus griseus</i>	short-billed dowitcher	Muskegs, bogs and marshes with low vegetation.	S1B, S4M <sub>1</sub>	---
<i>Melanerpes erythrocephalus</i>	red-headed woodpecker	Requires multiple snags for nesting, roosting, and foraging. Habitats used are: opendeciduous and riparian woodlands, savannah-like grasslands, forest edges and flooded bottomland forests.	S1B, S1M <sub>1</sub>	Special Concern <sub>4</sub>
<i>Numenius americanus</i>	long-billed curlew	Large tracts of open grassland with low vegetative cover for nesting.	S4B, S4M <sub>1</sub>	Special Concern <sub>4,5</sub>
<i>Numenius borealis</i>	Eskimo curlew	Open native grassland and tundra, burned prairies, meadows and pastures.	SHM <sub>1</sub>	G1 <sub>3</sub> , Endangered <sub>4,5,6</sub>
<i>Oporornis agilis</i>	Connecticut warbler	Spruce and tamarack bogs; dry ridges and knolls with open poplar woods; open immature jack pine woods.	S2B <sub>1</sub>	---
<i>Pelecanus erythrorhynchos</i>	American white pelican	Freshwater lakes in both treeless and forested areas.	S3B <sub>1</sub>	G3 <sub>3</sub>
<i>Phalaenoptilus nuttallii</i>	common poorwill	Semi-arid sagebrush benchlands or grassy openings in dry open woods.	S3B <sub>1</sub>	---
<i>Pinicola enucleator</i>	pine grosbeak	Open coniferous forest openings and edges; deciduous forest, shade trees around towns, apple orchards and tall shrubbery.	S2B, S4N <sub>1</sub>	---
<i>Piranga olivacea</i>	scarlet tanager	Mature deciduous woods, mixedwoods and pine woods.	S1B <sub>1</sub>	---
<i>Sialia sialis</i>	Eastern bluebird	Nests in eastern parklands, occasionally north to the Saskatoon and Greenwater Lake districts.	S4B <sub>1</sub>	---
<i>Sterna caspia</i>	Caspian tern	Large lakes with emergent vegetation and sandy beaches.	S2B, S2M <sub>1</sub>	---
<i>Strix nebulosa</i>	Great gray owl	Mixedwoods near water sources.	S3B, S3N <sub>1</sub>	---

Scientific Name	Common Name	Preferred Habitat	Provincial Rank <sub>1</sub>	Additional Designations
<i>Strix varia</i>	barred owl	Mature woodlands preferably near water bodies.	S3S4 <sub>2</sub> , S3B, S3N <sub>1</sub>	---
<i>Surnia ulula</i>	Northern hawk-owl	Open coniferous or mixedwoods, muskeg, or burnt areas with standing stumps.	S3B, S5N <sub>1</sub>	---
<i>Vireo flavifrons</i>	yellow-throated vireo	Mature deciduous woods along hillsides and riparian woods.	S2B, S3N <sub>1</sub>	---
<b>HERPTILES</b>				
<i>Bufo cognatus</i>	Great plains toad	Deserts, grasslands, semi-desert shrublands, open floodplains, and agricultural areas; typically in stream valleys. Burrows underground when inactive.	S2S3 <sub>2</sub> , S3 <sub>1</sub>	Special Concern <sub>4,5</sub> , Threatened <sub>6</sub>
<i>Chelydra serpentina</i>	snapping turtle	Prefer slow moving and shallow waters, can be found living on the edge of deep lakes and rivers.	S3 <sub>1</sub>	---
<i>Eumeces septentrionalis</i>	Northern prairie skink	Sandy areas located close to a water source such as a river or a swamp.	S2 <sub>2</sub>	Endangered <sub>4,5</sub>
<i>Liochlorophis vernalis</i>	smooth green snake	Meadows, grassy marshes, stream borders, abandoned farmland.	S3S4	---
<i>Rana pipiens</i>	Northern leopard frog	Streams or larger ponds that do not freeze solid with vegetation 15 to 30 cm tall.	S3 <sub>1</sub>	G5TNR <sub>3</sub> , Special Concern <sub>4,5</sub>
<i>Storeria occipitomaculata</i>	redbelly snake	Wooded hilly regions and at the edge of clearings near bogs.	S4 <sub>2</sub>	---
<b>FISH</b>				
<i>Acipenser fulvescens</i>	lake sturgeon	Bottom of gravelly tributary, streams of rivers and lakes.	S2S3 <sub>2</sub> , S2 <sub>1</sub>	G3G4 <sub>3</sub> , Endangered <sub>4</sub>
<i>Ambloplites rupestris</i>	rock bass	Well-oxygenated, hard water walleye lakes with boulder and sand bottoms.	S2S3 <sub>1</sub>	---
<i>Ameiurus nebulosus</i>	brown bullhead	Clear water in deep pools with submerged vegetation.	S3 <sub>1</sub>	---
<i>Hiodon tergisus</i>	mooneye	Clear water of large streams, rivers and lakes.	S3 <sub>1</sub>	---
<i>Ichthyomyzon castaneus</i>	chestnut lamprey	Medium and large rivers.	S3S4 <sub>2</sub>	Special Concern <sub>4</sub>
<i>Ictalurus punctatus</i>	channel catfish	Rivers and large creeks in slow to moderate current over sand, gravel or rocks; ponds, lakes, reservoirs.	S2S3 <sub>1</sub>	---
<i>Ictiobus cyprinellus</i>	bigmouth buffalo	Lowland lakes, sloughs and large rivers with slow to still waters and bottoms of mud, silt, sand and gravel.	S3 <sub>1</sub>	Special Concern <sub>4</sub>
<i>Macrhybopsis storeriana</i>	silver chub	Large, moderate flow rivers with a substrate of silt or sand, but sometimes gravel, rubble, boulder or bedrock.	S3 <sub>2</sub>	Special Concern <sub>4,5</sub>
<i>Notropis dorsalis</i>	bigmouth shiner	Runs and pools of shallow open headwaters, creeks, and small to medium rivers with bottom predominantly sand, often overlain with silt, sometimes also in lakes.	S3 <sub>2</sub>	---
<b>INVERTEBRATES</b>				
<i>Danaus plexippus</i>	monarch	Wherever milkweed and wildflowers exist. This includes abandoned farmland, along roadsides, and other open spaces where these plants grow.	S5 <sub>2</sub> , S3B <sub>1</sub>	Special Concern <sub>4,5</sub>
<i>Hesperia dacotae</i>	Dakota skipper	Native tall-grass prairies.	S2S3 <sub>2</sub> , S1 <sub>1</sub>	G2 <sub>3</sub> , Threatened <sub>4,5,6</sub>

Sources: After TERA (2007)

**Notes:**

- Provincial (S) ranks are based solely on the species' status within the province of Manitoba, and range from 1 (5 or fewer occurrences) to 5 (demonstrably secure under present conditions) (MB CDC 2011).  
 S1 = Critically Imperilled: because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation. Typically 5 or fewer occurrences or very few remaining individuals (<1,000).  
 S2 = Imperilled: because of rarity or because of some factor(s) making it very vulnerable to extirpation. Typically 6-20 occurrences or few remaining individuals (1,000-3,000).  
 S3 = Vulnerable: because rare and uncommon, or found in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21-100 occurrences or between 3,000 and 10,000 individuals.  
 S4 = Apparently Secure: uncommon but not rare, and usually widespread in the province. Possible cause of long-term concern. Usually more than 100 occurrences and more than 10,000 individuals.  
 S5 = Demonstrably Secure: common; widespread and abundant, though it may be rare in parts of its range. Usually more than 1000 occurrences.  
 S#S# = Range Rank: a numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element.  
 B = Breeding: basic rank refers to the breeding population of a migratory species in the element.

2. Global (G) ranks are based on species status world-wide and follow a system parallel to that for Provincial Ranks (Note 1), ranging from 1 (5 or fewer occurrences) to 5 (demonstrably secure under present conditions). Only Global Ranks of concern (G1 to G3) or questionable ranks are displayed (NatureServe 2011).
3. COSEWIC (2009). Species listed as 'Extirpated', 'Not at Risk' or 'Data Deficient' were generally not included in the table without other noteworthy factors being present.  
**Endangered:** A species facing imminent extirpation or extinction.  
**Threatened:** A species likely to become endangered if limiting factors are not reversed.

APPENDIX 5C  
ARCHAEOLOGICAL OVERVIEW