

Appendix 9-3
Botanical and Vegetation Resource
Survey Field Report

**BOTANICAL AND VEGETATION RESOURCE SURVEY OF THE PROPOSED
BERENS RIVER TO POPLAR RIVER FIRST NATION ALL-SEASON ROAD PROJECT 4
FIELD REPORT**

Prepared for:

Manitoba East Side Road Authority



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ERRATA

For:

*Botanical and Vegetation Resource Survey of the Proposed
Berens River to Poplar River First Nation All-Season Road Project 4 Field Report*

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Page 21, 22, Map 08 and Appendix III: Identified rare species one-spike cotton-grass (*Eriophorum scheuchzeri*) to be removed.

Appendix III: Addition of sheathed cotton-grass (*Eriophorum vaginatum*) S5.

SUMMARY

Thirty-three forested and wetland sites were sampled between Berens River and Poplar River along the proposed P4 alignment and quarry areas. Forested sites were classed into 10 vegetation community types, and wetland sites were classed into eight community types.

A total of 186 plant taxa were observed in the local assessment area. Six documented rare and uncommon species were recorded at or near survey sites. Two species of conservation concern, ranked rare (S2), were observed along the proposed All-Season Road assessment areas and included arethusa (*Arethusa bulbosa*) and one-spike cotton-grass (*Eriophorum scheuchzeri*). Other species of note included chestnut sedge (*Carex castanea*), dwarf bilberry (*Vaccinium caespitosum*), round-leaved bog orchid (*Platanthera orbiculata*) and parsley fern (*Cryptogramma acrostichoides*), ranked uncommon (S3) or uncommon to widespread (S3S4).

During the vegetation surveys, 36 cultural plant species were observed in the local assessment area. The most frequent species observed in sampled plots was black spruce. Other frequent species included willows, Labrador tea, bunchberry and velvet-leaved blueberry.

Three environmentally sensitive sites were identified from field assessments along the proposed All-Season Road. Sites included two locations for species of conservation concern, and a stand of older growth jack pine mixed forest.

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1.0 INTRODUCTION

1.1 Background

On the east side of Lake Winnipeg, Berens River First Nation and Northern Affairs Community, and Poplar River First Nation have relied primarily on winter road and air travel to transport people and goods. In 2008, the Government of Manitoba announced a strategic initiative to provide improved, safer and more reliable transportation services to connect the remote communities on the east side of Lake Winnipeg with the rest of Manitoba. Manitoba East Side Road Authority (ESRA), formerly Manitoba Floodway and East Side Road Authority (MFESRA), was established as a provincial Crown Agency to manage the East Side Transportation Initiative with the intent of increasing transportation opportunities for communities on the east side of Lake Winnipeg.

As part of the East Side Transportation Initiative, ESRA is proposing the construction of an all-season road along the east side of Lake Winnipeg from Berens River to Poplar River First Nation, Project 4 (P4). The proposed P4 all-season road will extend north from the first segment of the Transportation Initiative network; an all-season road from Provincial Road 304 (near Hollow Water First Nation) to Berens River First Nation and Northern Affairs Community along the east side of Lake Winnipeg (Project 1), already under construction.

1.2 Project Overview

The proposed All-Season Road will consist of 94.1 km of two-lane gravel highway on new Right-of-Way (RoW) on provincial Crown land, from the English Rapids Road south of the Berens River to the southern boundary of Poplar River First Nation (Appendix II, Map 1), where it will connect with a 410 m community access road on the reserve.

The all-season road will be a gravel-surface public highway, with a design width of 10 m. The all-season road will intersect four major water crossing and require bridges over the Berens, Etomami, North Etomami, and Leaf Rivers.

The components of the Project include the following:

- All-season road on new RoW
- Four bridges at river crossings
- Culverts for stream crossings and drainage
- Rock quarries and granular borrow areas
- Temporary access trails, staging areas and camps

The portion of the project located on Provincial Crown Land requires an Environmental Impact Assessment under the Manitoba Environment Act as a Class II development and under the Canadian Environmental Assessment Act. Additionally, the proposed project requires a separate federal environmental assessment for the portion of the project located on federal land (Poplar River community access road).

The specific objectives established for this study (based on the Request for Proposal, Reference # P4-EL-61) were as follows: i) describe vegetation types and composition, all overstory and understory species, and forest resource information; ii) verify the presence/absence of protected species and plant species of interest such as those traditionally used for medicine, subsistence and cultural purposes; and iii) conduct soil surveys associated with vegetation sampling.

2.0 STUDY AREA

The proposed All-Season Road Project is located on the east side of Lake Winnipeg, near Berens River First Nation, approximately 270 km north of Winnipeg (by air). The P4 All-Season Road begins approximately 500 m east of the boundary of the Berens River First Nation reserve, and extends north approximately 94.1 km from English Rapids Road on the south side of the Berens River to the Poplar River First Nation reserve boundary, approximately 400 km north of Winnipeg (by air). The proposed All-Season Road Project occurs in the Berens River and Wrong Lake Ecodistricts, which are located in the Lac Seul Upland Ecoregion and Boreal Shield Ecozone.

2.1 Spatial Boundaries

The spatial boundaries for the assessment consist of project, local and regional assessment areas and are described below, and illustrated in Appendix II, Map 1.

Project Assessment Area (PAA) – Footprint of the proposed All-Season Road Project, including rock quarries, borrow areas and access roads. The proposed All-Season Road will be centered on a 100 m RoW with a typical clearing width of 60 m and additional clearing as required at horizontal curves to maintain sight distances.

Local Assessment Area (LAA) – One km on either side of the proposed All-Season Road Project, including rock quarries, borrow areas and access roads.

Regional Assessment Area (RAA) – Five km on either side of the proposed All-Season Road Project.

2.2 Existing Environment

2.2.1 Ecological Land Classification

The proposed All-Season Road Project between the communities of Poplar River and Berens River, occurs entirely within both the Berens River Ecodistrict adjacent to the shoreline of Lake Winnipeg, and the Wrong Lake Ecodistrict, which lies to the east (Appendix II, Map 2). These ecodistricts occur within the Lac Seul Upland Ecoregion which extends from the shoreline of Lake Winnipeg into western Ontario, and from the Winnipeg River north to Norway House, and the Boreal Shield Ecozone, which stretches from northern Saskatchewan to Newfoundland (Smith et al. 1998).

2.2.2 Geology and Surficial Geology

The geology of the area consists of Precambrian rock from the Archean era (Geology of Manitoba 2015). In the vicinity of Poplar River and Berens River, the lithotect consists of metamorphosed early intrusive rocks, gneiss and migmatites. The unit consist of tonalite, minor granodiorite, granite, related gneiss, and magmatic gneiss containing tonalite and amphibolites. Late intrusive rocks occur approximately midway between Poplar River and Berens River, which consist of granite, granodiorite and gneiss (Geology of Manitoba 2015).

The surficial geology of the area is characterized by both organic and glaciolacustrine deposits, interspersed with local Precambrian bedrock ridge and knoll outcrops (Smith et al. 1998). Level to gently undulating organic deposits are from 1 – 5 m thick and accumulate in fen, bog, swamp and marsh settings. The glaciolacustrine sediments are very low relief, massive and laminated deposits of clay, silt and minor sand, deposited by glacial Lake Agassiz. Deposits were commonly scoured and homogenized by icebergs. The rock outcrops are generally unweathered intrusive, metasedimentary and metavolcanic rocks with a glacially scoured irregular surface with high local relief (Matile and Keller 2004).

2.2.3 Soils

Soils are similar across both ecodistricts, with wetter, lower lying soils closer to the shore of Lake Winnipeg. In the Berens River Ecodistrict, the dominant soils are poorly-drained, deep or shallow organic Mesisols developed from moderately decomposed peat, which overlie finer glaciolacustrine sediments. Well- to imperfectly-drained Gray Luvisols occur in localized areas, and are associated with calcareous glacial sediments glaciolacustrine loamy and clay textured soils. Poorly-drained peaty Gleysols occur to the north of the study area. To the east within the Wrong Lake Ecodistrict, imperfectly-drained Gray Luvisols are the dominant soils, while organic Mesisols are slightly less widespread (Smith et al. 1998). Acidic bedrock outcrops intersperse the extensively peat-covered lowland, increasingly more widespread to the east, with thin organic soils occurring in shallow depressions. Soils of the assessment area are shown in Appendix II, Map 3.

2.2.4 Topography and Drainage

Topography of the area is generally level, or gently undulating peat-covered lowland, occasionally interspersed by rock outcrops, with thin mantles of finer glacial sediments. Elevation is between 222 metres above sea level (masl), near the shore of Lake Winnipeg, and 245 masl for the next contour to the east (Smith et al. 1998).

The Lake Winnipeg Watershed drains from Ontario to the west into Lake Winnipeg, and then to the Nelson River Watershed to the north. Drainage is generally poor, due to low relief and the widespread occurrence of many deep and shallow peatlands.

The major rivers of the area include the Berens, Etomami, North Etomami, Leaf, and Poplar Rivers. The P4 alignment is intersected at several locations by rivers and streams, and other waterbodies (e.g. small lakes and ponds), shown in Appendix II, Map 4.

2.2.5 Landscape Level Vegetation

The vegetation across this region of Manitoba is primarily coniferous forest, with black spruce occurring widespread on imperfectly drained mineral and organic soils. Upland sites support black spruce, with willow and alder shrubs. The understory herb and shrub vegetation is sparse to absent, and ground cover is made up of feather mosses. Occasional mixed wood stands with balsam fir, white spruce, trembling aspen and balsam poplar form along warmer river valleys and south facing slopes, in the southern portion of the ecoregion. Mixed wood stands have generally more diverse shrub and herbaceous vegetation layers. Areas of rocky outcrops may have patchy tree growth, often dominated by jack pine, with an understory of ericaceous shrubs, herbs and mosses and lichens (Smith et al. 1998). The land cover classification is shown in Appendix II, Map 5.

2.2.6 Wetlands

The vegetation around the eastern shore of Lake Winnipeg reflects the nature of the dominant poorly-drained organic soils, and the distribution of wetlands in the P4 study area, (Appendix II, Map 6). Within the regional assessment area, wetland types present include bog and fen complexes, mineral wetlands, fens, and bogs (Halsey et al. 1997). Marshes, and other wetland complexes (peat and non-peat forming) are also present over the greater area, although not found within the P4 regional assessment area.

2.2.7 Quarry and Borrow Areas

Due to the widespread presence of wetlands throughout the project area, extensive aggregate for construction of the road will be pulled from other sites, and thirty-five potential rock quarries have been identified along the alignment (MFESRA 2015). Quarries range in size from 1.1 ha to 53.4 ha, with the majority (68.6%) of potential quarry sites less than 10 ha. For all quarries located off the alignment, access roads will be required.

3.0 METHODS

3.1 Sample Site Selection

Information provided by ESRA was used to select potential sites for vegetation sampling of the proposed All-Season Road Project. Information included route alignment high resolution imagery (30 cm), Project shapefiles such as the Land Cover Classification (LCC) and Aboriginal Traditional Knowledge data, and Google Earth imagery.

The LCC is a national vector database mapping layer that has been harmonized across the major federal departments involved in land management or land change detection (Agriculture and Agri-Foods Canada, Canadian Forest Service, and Canadian Centre for Remote Sensing). The LCC consists of remotely sensed imagery (Landsat data) as part of the Earth Observation for Sustainable Development of Forests Program. An enhanced LCC includes a further harmonization/integration of the ecological stratification of Manitoba's landscapes (Smith et al., 1998) and the addition of wetland features, fire history (Manitoba Conservation) and soil classes (National Soil Database, Agriculture and Agri-Food Canada).

Potential sample sites for the proposed All-Season Road Project were based on accessibility, vegetation cover type, disturbance, and areas with potential to support species of conservation concern and species of interest.

3.2 Native Vegetation and Soil Survey

Vegetation and soil surveys were planned to occur within a 1 km radius of the proposed All-Season Road Project, where most direct environmental effects are likely to occur. Fieldwork was conducted to record information on the local flora, describe vegetation types and forest conditions, search for species of conservation concern, document culturally important species, and classify soils.

3.2.1 Native Vegetation Survey

A native vegetation survey was used to sample and characterize plant communities. The survey consisted of establishing temporary sample plots on sites with relatively homogeneous vegetation. These included both upland and wetland sites. The sampling of vegetation composition was based on methods outlined in Redburn and Strong (2008). A 30 m transect was used with five 2.5 m by 2.5 m quadrats with a 1 m by 1 m nested quadrat spaced at 5 m increments along the transect for shrubs 1-2.5 m tall and herbs and low shrubs ≤ 1 m tall, respectively. The composition of tree cover >2.5 m tall was determined using a 20 m by 30 m plot centered on each transect. Percent cover of species was not

determined as a result of the timing of surveys, which were required to be completed by the end of June, 2015.

Within each plot, the tallest tree of each species was aged based on growth ring counts from a single core extracted with an increment corer at breast height (1.3 m). Diameter at breast height (DBH) was measured with a diameter tape. A clinometer was used to measure tree height at a distance of 20 m.

3.2.2 Soil Survey

One soil pit was dug inside each upland plot for description. At each soil pit, the thickness (cm) of the humus layer was measured. The thickness (cm) of soil horizons was measured and soils were classified according to the Canadian System of Soil Classification (Soil Classification Working Group 1998). In wetland sites, a hand held Dutch auger was used to extract, measure and classify soils.

3.2.3 Field Classification and Site Information

Field vegetation type classification for upland sites sampled followed Zoladeski et al. (1995) and Ducks Unlimited (2015) for wetlands.

Universal Transverse Mercator (UTM) geographic coordinates were recorded in the field for all temporary sample plots. Photographs were captured at each site visited.

3.3 Botanical Survey

Botanical surveys of the project area involved identification and tabulation of all observed vascular plant species including trees, shrubs, forbs and graminoids, and mosses and lichens.

3.3.1 Species of Conservation Concern

Searches for species of conservation concern concentrated on uncommon plant communities, and unusual habitats and landscape features. A meander search pattern was used when surveying for species of conservation concern.

Plant species of conservation concern include species that are rare, disjunct, or at risk throughout their range or in Manitoba. Species of conservation concern encompasses plants ranked very rare to rare by the Manitoba Conservation Data Centre (MBCDC), and those listed under the Manitoba Endangered Species and Ecosystems Act (ESEA), the federal Species at Risk Act (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). A database search of the MBCDC provincial records for known

locations of species of conservation concern in the vicinity of the Project was requested in March 2015.

Plant species of special interest, according to ESRA, include those species listed under Schedule 1 of SARA, endangered species listed under COSEWIC, and species ranked very rare to rare by the MBCDC.

The global (G) and sub-national (S) rarity ranking of species used by the MBCDC, according to a standardized procedure used by all Conservation Data Centres and Natural Heritage Programs is as follows:

- 1: Very rare throughout its range or in the province (5 or fewer occurrences, or very few remaining individuals). May be especially vulnerable to extirpation.
- 2: Rare throughout its range or in the province (6 to 20 occurrences). May be vulnerable to extirpation.
- 3: Uncommon throughout its range or in the province (21 to 100 occurrences).
- 4: Widespread, abundant, and apparently secure throughout its range or in the province, with many occurrences, but the element is of long-term concern (> 100 occurrences).
- 5: Demonstrably widespread, abundant, and secure throughout its range or in the province, and essentially impossible to eradicate under present conditions.

The conservation status categories for ESEA, SARA and COSEWIC are as follows:

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

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

Endangered: A species facing imminent extirpation or extinction.

Extirpated: A species no longer existing in the wild in Canada but exists elsewhere.

Extinct: A species that no longer exists.

3.3.2 Culturally Important Species

Other plant species of importance, such as those traditionally used for medicine, subsistence and cultural purposes, were recorded in the field. Prior to field studies, a list of culturally important species was compiled based on available information from ESRA and literature searches.

3.3.3 Collection Guidelines

All vascular plants were recorded and those unidentifiable in the field were collected, as voucher specimens, where the population size permits. Voucher specimens will be donated to the Manitoba Museum natural history collection and credited as a donation from the ESRA. Identification of vascular plants followed Flora of North America (1993+) and Scoggan (1978), and verification with herbarium specimens located at the Manitoba Museum. Plant nomenclature followed Flora of North America (1993+) and the Manitoba Conservation Data Centre for those plants not listed by Flora of North America (1993+). Fieldwork was conducted from June 12th to the 18th.

4.0 VEGETATION AND BOTANICAL RESOURCES

4.1 Native Vegetation Resources

Thirty-three forested and wetland sites were sampled between Berens River and Poplar River along the proposed P4 alignment and quarry areas. Appendix II, Map 7 shows the distribution of sites within the assessment area.

To summarize and characterize the local vegetation, forested and wetland sites were further classed into specific vegetation community types (Zoladeski et al. 1995; Ducks Unlimited 2014). Classification was carried out in the field based on data collected at each site, including vegetation composition, distribution and structure, and soil type and profile information. Vegetation community descriptions are presented for forested and wetland sites separately, for all vegetation strata present, i.e. trees, tall shrub canopy, and herb and low shrub understory. Forested (and one wetland) community type descriptions includes tree canopy composition, and age of tallest trees for species present. Tree species are referred to by common names, all other species are referenced with common and scientific names. For all species encountered in field surveys, see the flora list found in Appendix III.

Presence/absence data was recorded for all species in the tall shrub, and the herb and low shrub strata over five quadrats at each site. The distribution of all species based on frequency of occurrence within sites can be defined as widespread (species occurs in all 5 quadrats), frequent (occurs in 3-4 quadrats), occasional (occurs in 2 quadrats), or scattered (occurs in 1 quadrat). Species observed adjacent to or in the vicinity of sites, but not within the plots themselves, are included as incidental species.

4.1.1 Forest Community Site Types

Nineteen forested sites were sampled from areas of mainly broadleaf deciduous (4 sites), mixedwood conifer (3 sites), and conifer (12 sites) tree canopies. Forested sites were further classed into 10 forested vegetation community types, based on the vegetation composition and structure, and soils present at each site, using the Forest Ecosystem Classification for Manitoba (Zoladeski et al. 1995). Site locations, vegetation community classification, soil type and site surface information, as well as tree information are provided in Appendix IV, Table A. Community types are summarized in Table 4.1.1., with brief descriptions of soils and vegetation following, below.

Three sampled plots in forest communities were located in potential quarry sites (P4-07, P4-09 and P4-17), and two other sampled plots (P4-20 and P4-32) were located near potential quarry sites (3.8 m and 49.5 m away, respectively).

Table 4.1.1. Forest community types sampled in P4 between Berens River and Poplar River, 2015.

Community Types	Plot Identification	#	Soil Types	Total Species	Mean Species
Mainly Deciduous Communities					
V5 Aspen Hardwood	P4-25, P4-31	2	Luvisol	49	36
V8 Trembling Aspen Mixedwood/ Tall Shrub	P4-09, P4-11	2	Gleysol, Brunisol	39	23.5
Mixedwood Coniferous Communities					
V15 Jack Pine Mixedwood/ Shrub rich	P4-23	1	Luvisol	19	-
V18 Black spruce Mixedwood/ Feathermoss	P4-18, P4-27	2	Luvisol	26	15.5
Coniferous Communities					
V25 Jack pine/ Feathermoss	P4-01, P4-20	2	Brunisol	34	21
V26 Jack pine- Black spruce/ Lichen	P4-06, P4-07, P4-17, P4-21, P4-28	5	Folisol, Bedrock, Brunisol	23	9.5
V27 Black spruce/ Shrub- and herb- poor	P4-29	1	Luvisol	8	-
V28 Jack pine- Black spruce/ Feathermoss	P4-03	1	Luvisol	31	-
V29 Black spruce/ Feathermoss	P4-02	1	Gleysol	20	-
V30 Black spruce/ Labrador tea/ Sphagnum	P4-12, P4-32	2	Organic, Gleysol	31	19

4.1.1.1. Mainly Deciduous Forest Community Types

Aspen Hardwood (V5)

Two sites were classes as Aspen Hardwood, characterized as having deep moist upland mineral soils, with generally flat to undulating terrain (Appendix V, Photograph 1). The canopy is composed of trembling aspen, with no other tree species present. The tallest trees of the canopy were aged between 63 and 79 years. Aspen saplings make up the relatively open shrub canopy, with either Saskatoon or green alder present. The understory is herb rich, with 42 species of herbs and low shrubs occurring. Widespread species include Canada bunchberry (*Cornus canadensis*), smooth wild strawberry (*Fragaria virginiana*), pale vetchling (*Lathyrus ochroleucus*), twinflower (*Linnaea borealis*), fireweed (*Chamerion angustifolium*), prickly rose (*Rosa acicularis*). Two uncommon species were recorded in plots of this vegetation type: round-leaved bog orchid (*Platanthera orbiculata*, S3) and dwarf bilberry (*Vaccinium caespitosum*, S3). Leaf litter accounts for the ground layer, and unidentified mosses are scattered in occurrence.

Orthic Gray Brown Luvisols were classified at these sites. These soils had a humus form thickness of 5 cm. Soil horizons consisted of a sandy clay Ah ranging in thickness from 2 to 4 cm, a silty clay to sand clay loam Bt horizon ranging from 27 to 66 cm, followed by a silty clay loam to silty clay C horizon.

Trembling Aspen Mixedwood/ Tall Shrub (V8)

Two sites were classed as Trembling Aspen Mixedwood/ Tall Shrub (Appendix V, Photograph 2). Canopy species are trembling aspen with black spruce, with a presence of balsam poplar. The tallest aspen were aged between 38 and 52 years, while black spruce was aged between 18 and 22 years. Balsam poplar, present in one site was 30 years of age. Bebb's willow (*Salix bebbiana*), speckled and green alder (*Alnus incana* and *A. viridis*), and saplings of black spruce and white birch were found in the well-developed shrub canopy. A total of 31 herb and low shrub species were found in the understory, including bunchberry (*Cornus canadensis*), twinflower (*Linnaea borealis*), and northern starflower (*Trientalis borealis*), fireweed (*Chamerion angustifolium*), wood horsetail (*Equisetum sylvaticum*), marsh reed grass (*Calamagrostis canadensis*), with seedlings of black spruce and speckled alder. A mix of mosses including Schreber's moss (*Pleurozium schreberi*), *Polytrichum* mosses, splendid feather moss (*Hylocomium splendens*) and other unidentified mosses were recorded. No species of conservation concern were recorded in this vegetation type.

Brunisolic and Gleysolic soils were classified at these mixedwood sites. The Brunisol was characterized as having a humus form thickness of 7 cm followed by an Ae horizon 2 cm, with a sandy loam Bm horizon of 15 cm over bedrock. The Orthic Humic Gleysol had an Ah horizon of 10 cm, a silty clay loam Btg horizon 37 cm, followed by a silty clay loam C horizon of 43+ cm. Seepage in the soil pit occurred in the B and C horizons. The humus form thickness over this soil was 6 cm.

4.1.1.2. Mixedwood Coniferous Forest Community Types

Jack Pine Mixedwood/Shrub rich (V15)

A single site describes this upland vegetation type. The tallest trees of the canopy were aged as jack pine 82 years, black spruce 55 years, and trembling aspen 64 years. The well-developed shrub layer is composed of widespread green alder and frequent black spruce saplings (Appendix V, Photograph 3). Herbs and low shrubs (17 species) include smooth wild strawberry, twin flower, calypso (*Calypso bulbosa*), trailing club-moss (*Diphasiastrum complanatum*), northern starflower (*Trientalis borealis*), velvet-leaved blueberry (*Vaccinium myrtilloides*) and bog cranberry (*Vaccinium vitis-idaea*). Round-leaved bog orchid, (*Platanthera orbiculata*, S3), was recorded one plot. The most frequent ground moss is Schreber's feathermoss (*Pleurozium schreberi*).

The soil at this site was an Orthic Gray Brown Luvisol. Humus form thickness was 11 cm and soil horizons included an Ae of 2 cm, a clay loam Bt of 23 cm, and a silty clay loam C horizon 25+ cm.

Black spruce Mixedwood/ Feathermoss (V18)

Two sites were classed into this vegetation type. Black spruce and trembling aspen, with tamarack make up the tree canopy, while the largest of these trees were aged between 51

and 60 years for black spruce, and 57 years for trembling aspen and tamarack (Appendix V, Photograph 4). Typically, these sites have poorly developed shrub canopies, with occasionally occurring black spruce saplings, and Bebb's willow (*Salix bebbiana*). The herb and low shrub layer is also relatively poorly developed, and includes 21 species. Most frequently occurring are twinflower (*Linnaea borealis*), and bog cranberry (*Vaccinium vitis-idaea*). Black spruce seedlings, one-sided wintergreen (*Orthilia secunda*), prickly rose (*Rosa acicularis*), Bebb's willow (*Salix bebbiana*), and velvet-leaved blueberry (*Vaccinium myrtilloides*) have scattered occurrences. Both Schreber's feathermoss (*Pleurozium schreberi*) and splendid feather moss (*Hylocomium splendens*) are widespread in the ground layer. No species of conservation concern were recorded.

Soils at these sites were classified as Orthic Gray Brown Luvisols. These soils have a humus form thicknesses ranging from 3 to 12 cm followed by either an Ah (2 cm) or Ae (7 cm) horizon. Under the A horizon, occurred a silty clay loam to loam Bt horizon that ranged in thickness from 35 to 108 cm, followed by a loamy sand to sand clay loam C horizon. Bedrock was encountered at a depth of 70 cm at one of the sites.

4.1.1.3. Coniferous Forest Community Types

Jack pine/ Feathermoss (V25)

Two sites are described as Jack pine/ Feathermoss, with a tree canopy made up of jack pine (aged at 78-90 years), black spruce (29-72 years) with occasional immature trembling aspen and white birch (Appendix V, Photograph 5). The tall shrub layer, is composed of saplings of balsam fir (*Abies balsamea*), and black spruce, green alder (*Alnus viridis*), and occasional Saskatoon (*Amelanchier alnifolia*). The generally poorly developed herbs and low shrub understory is composed of 26 herbs and low shrubs. Most frequently occurring species is bunchberry (*Cornus canadensis*), with occasional running pine club-moss (*Lycopodium lagopus*), velvet-leaved blueberry (*Vaccinium myrtilloides*), twinflower (*Linnaea borealis*), and bog cranberry (*Vaccinium vitis-idaea*). Schreber's moss (*Pleurozium schreberi*), reindeer lichens (*Cladina mitis* and *Cladina rangiferina*), and *Dicranum* mosses provide a near continuous ground cover. No species of conservation concern were recorded.

Soils at these sites were classified as Brunisols. One site included a shallow Orthic Brunisol with a loamy sand Bm horizon (14 cm), over bedrock. An Eluviated Brunisol was also classified with a silty loam Ae horizon (9 cm) followed by a loamy sand Bm (55 cm), a sandy clay loam BC (16 cm) and a loamy sand C horizon. Humus form thickness ranged from 2 to 8 cm, over these soils.

Jack pine- Black spruce/ Lichen (V26)

Jack pine- Black spruce/ Lichen types are generally open canopied, with poorly developed tall shrubs and herbs understories (Appendix V, Photograph 6). In these five sites, the tree

canopy is composed of jack pine (mean age 70 years) and black spruce (mean age 52 years). The tall shrub layer is very poorly developed with only occasional black spruce and white birch saplings. Nineteen species of herbs and low shrubs are sparsely scattered, most frequently occurring is velvet-leaved blueberry (*Vaccinium myrtilloides*), and black spruce seedlings. Other infrequent occurrences include Saskatoon (*Amelanchier alnifolia*), bunchberry (*Cornus canadensis*), Linnaea borealis, (*Arctostaphylos uva-ursi*), smooth wild strawberry (*Fragaria virginiana*) and northern comandra (*Geocaulon lividum*). The forest floor is generally characterized by a cover of lichens, and ground cover is nearly continuous, with very frequent cover by reindeer lichens (*Cladina rangiferina*, *Cladina mitis* and *Cladina stellaris*), and frequent Schreber's moss (*Pleurozium schreberi*) and *Polytrichum* mosses. Parsley Fern (*Cryptogramma acrostichoides*, S3S4) was observed at one site.

Three soils were classified for these sites and included a non-soil, Folisol and Brunisol. The non-soil had a humus form thickness of 5 cm followed by bedrock. Folisols had a humus form thickness ranging from 5 to 7 cm. The humus layer was underlain by either a thin Ah horizon (2 cm) or sandy Bm horizon (4 cm), followed by bedrock. The Brunisolic soil had a humus form thicknesses of 4 cm followed by a sandy Bm horizon (14 cm) over bedrock.

Black spruce/ Shrub- and herb-poor (V27)

The Black spruce/ Shrub- and herb-poor vegetation type is characterized by black spruce stands, with absent or poorly developed tall shrub, floristically poor herb/ low shrub understories, and continuous feathermosses (Appendix V, Photograph 7). In this single site, the tallest black spruce (15 m) were aged at 54 years. The tall shrub canopy is generally absent, with scattered black spruce saplings. Herbs and low shrubs are made up of six species, all scattered in occurrence, including bunchberry (*Cornus canadensis*), smooth wild strawberry (*Fragaria virginiana*) and two-leaved Solomon's seal (*Maianthemum canadense*). Incidental species wild sarsaparilla (*Aralia nudicaulis*), tall lungwort (*Mertensia paniculata*) and wild red current (*Ribes triste*) were recorded in the vicinity of the plot. The well-developed ground layer is composed of widespread splendid feather moss (*Hylocomium splendens*) and Schreber's moss (*Pleurozium schreberi*). No species of conservation concern were recorded.

An Orthic Gray Brown Luvisol was classified at this site. Humus form thickness was 14 cm followed by a silty clay Ae horizon (20 cm), a loamy Bt horizon (18 cm), and a silty clay C horizon (12+ cm).

Jack pine- Black spruce/ Feathermoss (V28)

In this single Jack pine- Black spruce/ Feathermoss site, jack pine (age 104 years) and black spruce (age 83 years) are the canopy trees, with an occasional presence of balsam fir (Appendix V, Photograph 8). Green alder and black spruce saplings provide a scattered tall

shrub canopy. The herb and low shrub understory (26 species) is composed of widespread bunchberry (*Cornus canadensis*), two-leaved Solomon's seal (*Maianthemum canadense*), and frequently occurring bush-honeysuckle (*Diervilla lonicera*) and white-grained mountain rice grass (*Oryzopsis asperifolia*), while twinflower, (*Linnaea borealis*), northern star-flower (*Trientalis borealis*), velvet-leaved blueberry (*Vaccinium myrtilloides*) are occasionally present. All other herb and low shrubs have a very scattered occurrence. Schreber's moss (*Pleurozium schreberi*) is widespread in the ground layer, followed by splendid feather moss (*Hylocomium splendens*). No species of conservation concern were recorded.

The soil associated with this vegetation type was an Orthic Gray Brown Luvisols. The site had a humus form thickness of 10 cm. The soil was characterized with a silty clay loam Ae horizon of 15 cm, a silty clay loam Bt horizon of 43 cm, and a C horizon beginning at 58 cm depth.

Black spruce/ Feathermoss (V29)

This single site is a relatively open black spruce stand, the tallest tree aged at 91 years (Appendix V, Photograph 9). Tall shrubs are absent, but for scattered saplings of trembling aspen and balsam poplar. The herb and low shrub understory has 17 species, with widespread bunchberry (*Cornus canadensis*), common horsetail (*Equisetum arvense*), and bog cranberry (*Vaccinium vitis-idaea*), with frequent creeping snowberry (*Gaultheria hispidula*), twinflower (*Linnaea borealis*), and dewberry (*Rubus pubescens*). The nearly continuous ground layer is made up of splendid feather moss (*Hylocomium splendens*) and Schreber's moss (*Pleurozium schreberi*). No species of conservation concern were recorded.

The soil classified at this site was a Rego Humic Gleysol with a humus form thickness of 17 cm. Soil horizons included a clay loam Ah horizon (18 cm) followed by a clay loam C horizon (90+ cm). Mottling and seepage were observed in the C horizon.

Black spruce/ Labrador tea/ Feathermoss Sphagnum (V30)

These two lowland sites are black spruce stands (tallest average tree maximum age 44 years), with presence of jack pine (max age 42 years) in one site (Appendix V, Photograph 10). The tall shrub layer is moderately-well developed and composed of occasional black spruce (*Picea mariana*) and white birch (*Betula papyrifera*) saplings, green alder (*Alnus viridis*) and Bebb's willow (*Salix bebbiana*). The understory of this vegetation type can be characterized as poor to rich. Here, 23 herb and low shrub species make up the understory, although only Labrador tea (*Ledum groenlandicum*) and bog cranberry (*Vaccinium vitis-idaea*) are frequently occurring. Other understory species are scattered in occurrence, such as wood horsetail (*Equisetum sylvaticum*), rock polypody (*Polypodium virginianum*), sedges (*Carex foenea*, *Carex disperma*, *Carex leptalea*), as are a number of ericaceous shrubs, and seedlings of black spruce (*Picea mariana*), green alder (*Alnus viridis*), pin cherry (*Prunus*

pennsylvanica), and willows (*Salix bebbiana* and *Salix pseudomonticola*). The ground layer is composed of *Sphagnum* mosses with schreber's moss (*Pleurozium schreberi*), and occasional reindeer lichens (*Cladina rangiferina* and *Cladonia* spp). Chestnut Sedge (*Carex castanea*, S3) was observed at one site.

Two different soils were classified for this vegetation type, an Ortho Humic Gleysol and a Folisol. The Ortho Humic Gleysol had a humus form thickness of 18 cm that was underlain by a sandy clay loam Ahe horizon (17 cm), followed by a silty clay loam Bg horizon (40 cm), and a silty clay Cg horizon (13+ cm). Both mottling and water seepage was observed in the B Horizon. The Folisol was characterized as having no humus form layer, but soil horizons were identified as an Of (10 cm) followed by an Oh (31 cm), over bedrock.

4.1.2 Wetland Community Types

Fourteen sites sampled were considered wetlands, characterized by vegetation that is adapted to flooded or saturated conditions, with water permanently or seasonally present, at above or below the surface. Site locations, vegetation community classification, soil type and site surface information, as well as tree information are provided in Appendix IV, Table B.

Wetland sites were further classed in to eight wetland community types (Ducks Unlimited 2014), based on soil type, vegetation composition and height, and water regime, summarized in Table 4.1.2. Wetland community types include bog, fen, marsh, swamp and riparian communities. A description of the soils and vegetation of the community types encountered follows.

Table 4.1.2. Wetland community types sampled in P4 between Berens River and Poplar River, 2015.

Community Types	Plot Identification	Plots Sampled	Soil Types	Total Species	Mean Species
Treed bog (V33)	P4-05, P4-24, P4-26	3	Organic	32	16
Shrub bog	P4-13	1	Organic	12	-
Treed poor fen	P4-19	1	Organic	18	-
Shrub poor fen	P4-16	1	Organic	10	-
Graminoid fen	P4-08, P4-15	2	Organic	23	14
Shrub swamp	P4-30, P4-33	2	Gleysol	40	22
Riparian shrub	P4-14	1	Gleysol	23	-
Meadow marsh	P4-04, P4-10, P4-22	3	Gleysol	26	4.5

Treed Bog (V33 Black spruce/ Sphagnum)

Three sites make up this vegetation type, the very open canopy is made up of black spruce, with a presence of jack pine (Appendix V, Photograph 11). The shrub layer is composed of mainly black spruce saplings, with green alder (*Alnus viridis*), bog birch (*Betula pumila*) and saplings of tamarack and jack pine. The herb layer is generally floristically poor. There was

a total of 25 species recorded in this vegetation type, though many are scattered in occurrence. All sites had widespread occurrence of leather leaf (*Chamaedaphne calyculata*), Labrador tea (*Rhododendron groenlandicum*) and small cranberry (*Vaccinium oxycoccos*). Other frequently occurring species included swamp horsetail (*Equisetum fluviatile*), three-leaved Solomon's seal (*Maianthemum trifolium*), dwarf birch (*Betula pumila*), and bog willow (*Salix pedicellaris*). Two species of conservation concern were found, including one-spoke cotton-grass (*Eriophorum scheuchzeri*, S2?) in one plot, and the arethusa orchid (*Arethusa bulbosa*, S2) an incidental species, at a single site. Ground cover is widespread *Sphagnum* mosses, with occasional unknown mosses, Schreber's moss (*Pleurozium schreberi*), splendid feather moss (*Hylocomium splendens*), and gray reindeer lichen (*Cladina rangiferina*).

The organic soils encountered in the treed bog wetlands included Typic Mesisol, Mesic Humisols and and Typic Humisol. The Typic Mesisol was classified as having an Of horizon of 56 cm, an Om of 64 cm, and an Oh horizon beginning at a depth of 120 cm. The Mesic Humisol was characterized as having an Of of 10 cm, Om of 30 cm and an Oh of 80 cm. The C horizon was reached at 120 cm. The Typic Humisol had an Of of 20 cm, Om of 10 cm and an Oh of 90+ cm.

Shrub Bog

This single site was very wet, and full sampling was not possible, however the species in the site area present are noted as follows. There is no tree canopy, with only speckled alder (*Alnus incana*) present in the shrub canopy (Appendix V, Photograph 12). The herb and low shrub species present are dwarf birch (*Betula pumila*), sedges (*Carex* spp), leather leaf (*Chamaedaphne calyculata*), swamp horsetail (*Equisetum fluviatile*), and bog willow (*Salix pedicellaris*). Other species present are very scattered, occurring only incidentally in the vicinity of plots, including seedlings of white birch (*Betula papyrifera*) and tamarack (*Larix laricina*), sedges (*Carex aquatilis* and *Carex chordorrhiza*), marsh five-finger (*Comarum palustre*), and Labrador tea (*Rhododendron groenlandicum*). Water and *Sphagnum* mosses make up the ground layer. No species of conservation concern were recorded.

The soil classified for this vegetation type was a Humic Mesisol, an organic soil, classified as having an Om horizon of 50 cm followed by an Oh horizon 70 cm thick. Water was present at the surface at this site.

Treed Poor Fen

This single site had an open canopy of black spruce and tamarack (Appendix V, Photograph 13). The tall shrub canopy included dwarf birch (*Betula pumila*) and saplings from the tree canopy. Thirteen species were recorded in the understory, with widespread to frequent

occurrence of low shrubs including dwarf birch (*Betula pumila*), bog willow (*Salix pedicellaris*), Labrador tea (*Rhododendron groenlandicum*), leather leaf (*Chamaedaphne calyculata*), and small cranberry (*Vaccinium oxycoccos*), as well as sedges (*Carex chordorrhiza* and *Carex aquatilis*), and swamp horsetail (*Equisetum fluviatile*). *Sphagnum* mosses and litter are widespread throughout, with occasional water at ground level. No species of conservation concern were recorded.

A Mesic Humisol was classified at this treed poor fen site. No humus form was observed and horizons of this organic soil included an Om of 70 cm thickness followed by an Oh horizon of 160+ cm. Water was observed near the surface.

Shrub Poor Fen

This single site has 10 species present in the herb and low shrub layer, with no other tree or tall shrub canopy structure present (Appendix V, Photograph 14). Widespread low shrubs present are bog rosemary (*Andromeda polifolia*), dwarf birch (*Betula pumila*), and bog willow (*Salix pedicellaris*), while leather leaf (*Chamaedaphne calyculata*) is occasional, and speckled alder (*Alnus incana*) is scattered in occurrence. Sedges are widespread (*Carex chordorrhiza* and *Carex lasiocarpa*), with scattered water sedge (*Carex aquatilis*) and swamp horsetail (*Equisetum fluviatile*), and occasionally occurring marsh five-finger (*Comarum palustre*). Ground water and litter is widespread, with scattered occurrences of *Sphagnum* and unidentified mosses. No species of conservation concern were recorded.

The organic soil classified at this site was a Mesic Humisol with an Om horizon of 45 cm overlying an Oh horizon of 75+ cm. Water was observed at the surface of this soil.

Graminoid Fen

No trees are present in the two sites that make up this vegetation type (Appendix V, Photograph 15). The tall shrub canopy includes scattered tamarack saplings, dwarf birch (*Betula pumila*) and speckled alder (*Alnus incana*). Twenty species were recorded in the herb and low shrub understory, widespread to frequently occurring are leather leaf (*Chamaedaphne calyculata*), bog willow (*Salix pedicellaris*), dwarf birch (*Betula pumila*) and prostrate sedge (*Carex chordorrhiza*). The ground layer is made up of *Sphagnum* and unidentified mosses, water and litter. The arethusa orchid (*Arethusa bulbosa*, S2) was incidentally observed in the vicinity of both sites.

Soils were classified as Humic Mesisol and Fibric Humisol. The Humic Mesisol had no humus layer and horizons were classified as an Of horizon (20 cm), followed by an Om (80 cm) and Oh (20 cm) horizons. Soils were saturated and water was present at the surface at

this site. The Fibric Humisol was saturated and horizons included an Of of 50 cm followed by an Oh of 170 cm.

Shrub Swamp

Scattered black spruce and tamarack occur in one site (Appendix V, Photograph 16). The tall shrub canopy (eight species) has frequently occurring tea-leaved willow (*Salix planifolia*), and occasional sandbar willow (*Salix exigua*) and speckled alder (*Alnus incana*). Saplings of black spruce and tamarack are also occasional. Other tall shrubs, including red osier dogwood (*Cornus sericea*) and Bebb's willow (*Salix bebbiana*), have very scattered occurrence. Thirty herb and low shrub species make up the understory most frequent are graminoids, including marsh reed grass (*Calamagrostis canadensis*), water sedge (*Carex aquatilis*), and bristle-stalked sedge (*Carex leptalea*). Other species are very scattered in occurrence. *Sphagnum* is widespread, while other mosses are scattered to make up the ground cover. There were no species of conservation concern recorded.

Soils identified at these sites included a Rego Gleysol and Orthic Humic Gleysol. No humus form was observed for the Rego Gleysol and horizons were classified as an Oh of 38 cm followed by a clay Cg horizon (32+ cm). A humus layer of 7 cm was identified for the Orthic Humic Gleysol soil. Soil horizons were characterized as a silty clay Ah (10 cm), sandy clay Bg (50 cm) and a clay Cg (15+ cm). Mottling was observed in the Cg horizon.

Riparian Shrub

White spruce trees are present in the single site of this wetland vegetation community (Appendix V, Photograph 17). The shrub canopy has frequently occurring meadowsweet (*Spirea alba*), and scattered balsam poplar saplings and Saskatoon (*Amelanchier alnifolia*). Of the nineteen herb and low shrub species present, fringed brome (*Bromus ciliatus*) is widespread, while prickly rose (*Rosa acicularis*) is frequently occurring. White birch (*Betula papyrifera*) seedlings, alder-leaved buckthorn (*Rhamnus alnifolia*), bristly black currant (*Ribes lacustre*), and wild red raspberry (*Rubus idaeus*) occur occasionally. The remainder of species are scattered in occurrence. No mosses or lichens, and no species of conservation concern were noted in these sites.

A Rego Gleysol was classified at this riparian site and was characterized as having a humus form thickness of 3.5 cm followed by a thin Ah horizon (1 cm thick) and a silty clay Cg horizon (60+ cm).

Meadow marsh

Trees and tall shrubs are absent from this wetland vegetation community (Appendix V, Photograph 18). These three sites are open graminoid marshes with relatively low floristic

diversity (14 species), with widespread to frequent occurrence of marsh reed grass (*Calamagrostis canadensis*) and sedges (such as *Carex atherodes*, *Carex chordorrhiza*, and *Carex lasiocarpa*). The low shrub sand-bar willow (*Salix exigua*) is frequent to absent in sites. One site in this vegetation community had slightly higher floristic diversity due to an additional 12 species (forbs and one grass) with very scattered occurrence observed in the vicinity of plots. Ground litter is widespread, and unidentified mosses are occasionally present. No species of conservation concern were recorded.

Soils classified for this vegetation type included Rego Gleysol and Rego Humic Gleysol. Rego Gleysols were observed at two sites and were characterized as having either an Of 10 cm or Oh 33 cm, followed by a clay Cg horizon ranging from 60 to 67+ cm. The Rego Humic Gleysol was classified as an Om of 5 cm, overlying an Ah horizon 3 cm, followed by a clay Cg horizon of 52+ cm.

4.2 Botanical Resources

4.2.1 Plants and Distribution of Species

Vegetation composition was recorded at 33 sites along the proposed All-Season Road and quarry areas (see Appendix II, Map 7). A total of 186 plant taxa were observed in the local assessment area (Appendix III). There were 177 plants identified to the species level while nine taxa were identified to the genus level including three vascular (herbs) and six non-vascular plants (mosses and lichens). Vascular plants identified only to the genus level were a result of absent or non-mature floral or fruiting parts when observed during the field assessment which are used for identification.

All plants were grouped by primitive vasculars (eg. ferns and horsetails), gymnosperms (conifers), angiosperms (flowering plants) and non-vascular plants. Angiosperms were divided into monocotyledons and dicotyledons with this group (angiosperms) of plants representing the greatest number of species. There were 156 angiosperms (52 monocotyledons and 104 dicotyledons), 10 primitive vasculars, six gymnosperms, and 14 non-vascular plants.

Vascular plants were distributed among 50 families, with the angiosperms representing 43 of these. The sedge (Cyperaceae) family was the largest with 23 plant taxa, followed by the grass (Poaceae) and rose (Rosaceae) families, with 13 species each. Greater than seven species were observed in each of the crowfoot (Ranunculaceae), heath (Ericaceae), willow (Salicaceae) and orchid (Orchidaceae) families. The primitive vasculars are distributed among five families including the horsetail (Equisetaceae), club-moss (Lycopodiaceae), maidenhair fern (Pteridaceae), polypody (Polypodiaceae) and wood fern (Dryopteraceae).

Species within the gymnosperms were members of the cypress (Cupressaceae) and pine (Pinaceae) families.

4.2.2 Species of Conservation Concern and Other Species of Note

The forested and wetland communities in the project area support a wide range of species. Six documented rare and uncommon species were recorded at or near survey sites (Appendix II, Map 8). Preferred species habitat descriptions are taken from Flora of North America (2015).

Two species of conservation concern, ranked rare (S2) throughout their range or in the province, were observed along the proposed All-Season Road assessment areas (Table 4.2.2.). The orchid arethusa (*Arethusa bulbosa*) was observed in three graminoid fen sites as an incidental species, in the vicinity of plots, one within the Project assessment area. Arethusa is found generally on Sphagnum hummocks in coniferous bogs and fens.

One-spike cotton-grass (*Eriophorum scheuchzeri*) was observed at one location, and within the Project assessment area. One-spike Cotton-grass is found on wet peat, marshy ground, and peaty soils. It was recorded in a black spruce and sphagnum bog site, as an incidental species.

Other species of note included chestnut sedge (*Carex castanea*), dwarf bilberry (*Vaccinium caespitosum*), round-leaved bog orchid (*Platanthera orbiculata*) and parsley fern (*Cryptogramma acrostichoides*). These species are all ranked uncommon (S3) in Manitoba except for parsley fern which is intermediate between uncommon and apparently widespread (S3S4).

Chestnut sedge is found in rich mesic deciduous or mixed conifer-hardwood forests, mixed coniferous forests and margins, mesic meadows. It was observed in a single trembling aspen mixedwood stand with tall shrubs. Dwarf bilberry is found in open, usually dry habitats. It was observed in plots at a trembling aspen site. Round-leaved bog orchid is found generally in moist coniferous and deciduous forests, and fen forests. Non-flowering plants can be easily overlooked. It was observed in plots of two sites, a trembling aspen site, and a jack pine mixedwood site. Parsley fern can be found on non-calcareous cliff crevices, and rock outcrops, often in relatively dry habitats. It was recorded in a jack pine-black spruce stand. Only dwarf bilberry and round-leaved bog orchid were observed within the Project Assessment area (Table 4.2.2.).

No species listed by the Manitoba Endangered Species and Ecosystems Act, the federal Species at Risk Act, or the Committee on the Status of Endangered Wildlife in Canada were observed during fieldwork. Vascular species at risk were not expected to occur as the

assessment area is beyond the range for these plants. Flooded jellyskin (*Leptogium rivulare*) lichen is listed as threatened by the Species at Risk Act and the Committee on the Status of Endangered Wildlife in Canada but was not observed during field studies.

Table 4.2.2. Species of conservation concern and other species of note observed in or incidental to P4 survey sites.					
Family	Scientific Name	Common Name	MBCDC Rank	Plot (P4-)	Project Location¹
Species of Conservation Concern					
Orchidaceae	<i>Arethusa bulbosa</i>	Arethusa	S2	08	LAA
Orchidaceae	<i>Arethusa bulbosa</i>	Arethusa	S2	15	LAA
Orchidaceae	<i>Arethusa bulbosa</i>	Arethusa	S2	24	PAA
Cyperaceae	<i>Eriophorum scheuchzeri</i>	One-spike Cotton-grass	S2?	05	PAA
Other Species of Note					
Cyperaceae	<i>Carex castanea</i>	Chestnut Sedge	S3	11	LAA
Ericaceae	<i>Vaccinium caespitosum</i>	Dwarf Bilberry	S3	25	PAA
Orchidaceae	<i>Platanthera orbiculata</i>	Round-leaved Bog Orchid	S3	23	LAA
Orchidaceae	<i>Platanthera orbiculata</i>	Round-leaved Bog Orchid	S3	31	PAA
Pteridaceae	<i>Cryptogramma acrostichoides</i>	Parsley Fern	S3S4	28	LAA

1: PAA is Project Assessment Area and LAA is Local Assessment Area.

4.2.3 Invasive and Non-native Species

Five invasive and non-native species were observed during the surveys and as incidental observations. Invasive plant species included common burdock (*Arctium minus*), caraway (*Carum carvi*), reed canary grass (*Phalaris arundinacea*), common dandelion (*Taraxacum officinale*) and alsike clover (*Trifolium hybridum*). These species are members of four families including aster (Asteraceae) with two species (common burdock and common dandelion), pea (Fabaceae) with alsike clover, grass (Poaceae) with reed canary grass, and the carrot family (Apiaceae) with caraway.

All species were observed in Berens River, near Lake Winnipeg. Only reed canary grass was observed in the Project assessment area, at one site, in a meadow marsh wetland. These plants are listed by the MBCDC as having a conservation status rank that is not applicable to the element (SNA) or demonstrably widespread and abundant (S5).

4.2.4 Culturally Important Species

Other plant species, such as those traditionally used for medicine, subsistence and cultural purposes is a component of the project that was assessed in order to understand the

importance of certain plant species in the local assessment area. Aboriginal communities have long histories of living on the land as well as knowledge, experience and an appreciation for the plants growing in their resource areas.

A traditional knowledge workshop was held in Poplar River First Nation on June 17, where several species of trees, shrubs and herbs were identified as being important to community. Species are listed using plant names provided by the community. Important trees included black spruce, birch, balsam, poplar, white spruce, jack pine and diamond willow, which are also medicines. Other species and medicines that may be present include mountain ash (rare), bearberry, yellow pond lily, sweet flag, wild rose, mint, red willow, moose berry, wild ginseng, tamarack, strawberry, raspberry, Saskatoon, Labrador tea, sagewort, stinging nettle, yarrow, sweet gale, sweet grass, black poplar, scrub oak (rare), and sarsaparilla. Wild rice is known to occur at creeks.

With development of the proposed all-season road, Poplar River First Nation recognized that improved access will result for berry picking such as for blueberries, Saskatoon, raspberries, strawberries, muskeg berries, chokecherries, and both high bush and low bush cranberries.

Plant species identified as having cultural value to the local First Nation communities were recorded in the field, along the proposed All-Season Road and quarry areas (Table 4.2.4.). Culturally important species were identified from a study on indigenous plants that was produced to describe Aboriginal values and uses for local plants (Asatiwisipe Aki Management Plan 2011). The guide lists 50 different trees, shrubs, herbs, mosses and lichens that have been used for sustenance and in traditional cultural practices. During the vegetation surveys, 36 cultural plant species were observed in the local assessment area at 33 sampled sites. The most frequent species observed in sampled plots was black spruce, which was recorded in 20 plots. Willow species were recorded in 17 plots followed by Labrador tea, bunchberry and velvet-leaved blueberry which were recorded in 13 plots. Other species with high occurrences in plots included reindeer lichen which was recorded in 12 plots, and jack pine and *Sphagnum* which were recorded in 11 plots.

Other species of importance, identified by Poplar River First Nation, that were observed in the field included choke cherry, stinging nettle and common yarrow.

Form	Anishinabek Name	Scientific Name	Common Name	Location (Plot P4-)
Tree	Azaadi	<i>Populus tremuloides</i>	Trembling Aspen/Poplar	01, 02, 07, 09, 11, 18, 23, 25, 27, 31
Tree	Maanazaadi	<i>Populus balsamifera</i>	Balsam Poplar	02, 11, 14
Tree	Mina'ig	<i>Picea glauca</i>	White Spruce	14
Tree	Nipigandag	<i>Abies balsamea</i>	Balsam Fir	03
Tree	Mashkiigoatig	<i>Larix laricina</i>	Tamarack/Larch	13, 15, 18, 19, 24, 26, 30, 31
Tree	Zhigob	<i>Picea mariana</i>	Black Spruce	01, 02, 03, 05, 07, 09, 11, 12, 17, 18, 19, 20, 23, 24, 26, 27, 28, 29, 30, 32
Tree	Ogik	<i>Pinus banksiana</i>	Jack Pine	01, 03, 06, 07, 12, 17, 18, 20, 21, 23, 24, 28
Tree	Wiigwas	<i>Betula papyrifera</i>	Paper Birch/White Birch	01, 09, 12, 13, 14, 21
Shrub	Ininiminan	<i>Vaccinium caespitosum</i>	Dwarf Blueberry	25
Shrub	Miishinchiiminag	<i>Ribes triste</i>	Swamp Red Currant	01, 02, 11, 14, 29
Shrub	Miskopiimag, Omagaakiiminan	<i>Cornus seracea</i>	Red-osier Dogwood, Red Willow	14, 25, 30
Shrub	Moozominan	<i>Viburnum edule</i>	Mooseberry/Low-bush Cranberry	03, 27, 31
Shrub	Pagaanag	<i>Corylus cornuta</i>	Beaked Hazelnut	14
Shrub	Wiigopiin, wiisagopiimag	<i>Salix</i> spp.	Willows	08, 09, 10, 11, 12, 13, 15, 16, 18, 19, 22, 24, 25, 26, 30, 32, 33
Shrub	Gaagigebag, mashkiigobagoon	<i>Rhododendron groenlandicum</i>	Labrador Tea	02, 05, 11, 12, 13, 15, 19, 20, 24, 25, 26, 30, 32
Shrub	Mashkiigominan	<i>Vaccinium oxycoccus</i>	Bog Cranberry	05, 12, 15, 19, 24, 26, 30, 32
Shrub	Waapigoshiminan	<i>Gaultheria hispidula</i>	Creeping Snowberry/Wintergreen	02, 20
Shrub	Gaagaagiwanatig	<i>Juniperus communis</i>	Common Juniper	Not observed
Shrub	Ininiminan/	<i>Vaccinium myrtilloides</i>	Velvet-leaved blueberry	03, 06, 07, 09, 12, 17, 18, 20, 21, 23, 25, 31, 32
Shrub	Makominan/	<i>Arctostaphylos uva-ursi</i>	Bearberry	01, 03, 18, 20, 21, 25, 31
Shrub	Makominatig	<i>Sorbus decora</i>	Mountain Ash	Not observed
Shrub	Miskominag	<i>Prunus</i>	Pin Cherry	01, 32

Table 4.2.4. Plants of cultural importance listed by name and plot location.				
Form	Anishinabek Name	Scientific Name	Common Name	Location (Plot P4-)
		<i>pennsylvanica</i>		
Shrub	Miskominan	<i>Rubus idaeus</i>	Wild Red Raspberry	14
Shrub	Mizaakotoominag	<i>Amelanchier</i> spp.	Saskatoon/Serviceberry	01, 02, 03, 06, 14, 21, 25, 31
Shrub	Nikiminan	<i>Ribes oxycanthoides</i>	Gooseberry	14
Shrub	Wiisagiminan	<i>Vaccinium vitis-idaea</i>	Cranberry	02, 12, 18, 20, 23, 26, 30, 32
Shrub	Oginiik	<i>Rosa acicularis</i>	Prickly Rose	02, 03, 14, 18, 20, 25, 27, 31
Vine	Waapiizhishooatig	<i>Lonicera dioica</i>	Twining Honeysuckle	25, 31
Herb	Ginebigominan	<i>Actaea rubra</i>	Baneberry	03
Herb	Nishkiinzhigominan	<i>Rubus pubescens</i>	Dewberry	02, 03, 11, 18, 23, 25, 30, 31
Herb	Oteiminan, oteiminatigoon	<i>Fragaria virginiana</i>	Wild Strawberry	03, 11, 21, 23, 25, 29, 31
Herb	Ozhaashaagominan	<i>Cornus canadensis</i>	Bunchberry	01, 02, 03, 09, 11, 12, 20, 21, 23, 25, 27, 29, 31
Herb	Waaboozoiibik	<i>Sanicula marilandica</i>	Snakeroot	31
Herb	Omikawingushk	<i>Mentha arvensis</i>	Wild Mint	Not observed
Herb	Pozaagan, zhigaagomish	<i>Typha latifolia</i>	Cattail	10
Herb	Wiike, wiikens	<i>Acorus americanus</i>	Ratroot/Sweet Flag	Not observed
Herb	Gichimashkosiin	<i>Phragmites australis</i>	Giant Reed grass	Not observed
Herb	Mashkosiiminan	<i>Zizania palustris</i>	Wild Rice	Not observed
Herb	Majimashkoos	<i>Toxicodendron rydbergii</i>	Poison Ivy	Not observed
Herb	Oshkiitebagoon	<i>Maianthemum canadense</i>	Wild lily-of-the-valley	01, 02, 03, 11, 25, 29, 31, 33
Herb	Pizhiigojiibik	<i>Heuchera richardsonii</i>	Alumroot	Not observed
Herb	Choochooshaaboojiibik	<i>Taraxacum officinale</i>	Common Dandelion	Not observed
Herb	Kawaapanakiig	<i>Heracleum lanatum</i>	Cow Parsnip	Not observed
Herb	Ozagaanjiigesiiwag	<i>Arctium minus</i>	Burdock	Not observed
Herb	Pizhikiwingushk	<i>Artemisia absinthium</i>	Sagewort/Wormwood	Not observed
Herb	Mazaanowashkoon	<i>Hordeum jubatum</i>	Foxtail Barley	Not observed

Form	Anishinabek Name	Scientific Name	Common Name	Location (Plot P4-)
Lichen	Aasaakamig	<i>Cladina</i> spp.	Reindeer Lichen	01, 03, 06, 07, 12, 17, 18, 20, 21, 23, 26, 28
Moss	Aagi, mashkiig, miskokamig	<i>Sphagnum</i> spp.	Sphagnum/Peatmoss	05, 08, 12, 13, 15, 16, 19, 24, 26, 30, 32
Fungus	Asiniiwakwanag	<i>Umbilicaria</i> spp.	Brown Rock Tripe	32
Fungus	Kabaashkaanasewa, Pozaaganag	<i>Lycoperdon</i> spp.	Puffball	Not observed

4.3 Environmentally Sensitive Sites

Three environmentally sensitive sites were identified from field assessments along the proposed All-Season Road. These sites included locations for two species of conservation concern, arethusa and one-spike cotton-grass, ranked rare by the MBCDC and a stand of older growth jack pine mixed forest, aged at 104 years (Table 4.3.). Many traditional plant species of interest were recorded from the surveys, but these species were more commonly distributed over the landscape.

Site	Location (Plot P4-)
Arethusa (<i>Arethusa bullbosa</i>)	24
One-spike cotton-grass (<i>Eriophorum scheuchzeri</i>)	05
Older growth Jack pine forest	03

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APPENDIX I. Definitions of Selected Technical Terms¹.

Bog – Ombrotrophic peatlands generally unaffected by nutrient-rich groundwater that are acidic and often dominated by heath shrubs and Sphagnum mosses and that may include open-growing, stunted trees.

Boreal – Pertaining to the north; a climatic and ecological zone that occurs south of the subarctic, but north of the temperate hardwood forests of eastern North America, the parkland of the Great Plains region, and the montane forests of the Canadian cordillera.

Canopy – The more or less continuous cover of branches and foliage formed by the crowns of trees.

Canopy Closure – The degree of canopy cover relative to openings.

Classification – The systematic grouping and organization of objects, usually in a hierarchical manner.

Community-Type – A group of vegetation stands that share common characteristics, an abstract plant community.

Coniferous – A cone-bearing plant belonging to the taxonomic group Gymnospermae.

Cover – The area of ground covered with plants of one or more species, usually expressed as a percentage.

Deciduous – Refers to perennial plants from which the leaves abscise and fall off at the end of the growing season.

Ecoregion – An area characterized by a distinctive regional climate as expressed by vegetation.

Family – Taxonomic grouping of plants that are related at a particular hierarchical level.

Fen – Wetland with a peat substrate, nutrient-rich waters, and primarily vegetated by shrubs and graminoids.

Flora – A list of the plant species present in an area.

Forest – A relatively large assemblage of tree-dominated stands.

Graminoid – A plant that is grass-like; the term refers to grasses and plant that look like grasses, i.e., only narrow-leaved herbs; in the strictest sense, it includes plants belonging only to the family Graminaceae.

Habitat – The place in which an animal or plant lives; the sum of environmental circumstances in the place inhabited by an organism, population or community.

Invasive – Invasive species are plants that are growing outside of their country or region of origin and are out-competing or even replacing native plants (Invasive Species Council of Manitoba).

Mixedwood – Forest stands composed of conifers and angiosperms each representing between 25 and 75% of the cover.

Riparian – Refers to terrain, vegetation or simply a position adjacent to or associated with a stream, flood plain, or standing body of water.

Shrub – A perennial plant usually with a woody stem, shorter than a tree, often with a multi-stemmed base.

Species – A group of organisms having a common ancestry that are able to reproduce only among themselves; a general definition that does not account for hybridization.

Stand – A collection of plants having a relatively uniform composition and structure, and age in the case of forests.

Terrestrial – Pertaining to land as opposed to water.

Understory – Vegetation growing beneath taller plants such as trees or tall shrubs.

Vascular – Having tissues that transport water, sap, nutrients; refers to plants that are not mosses, lichens and algae.

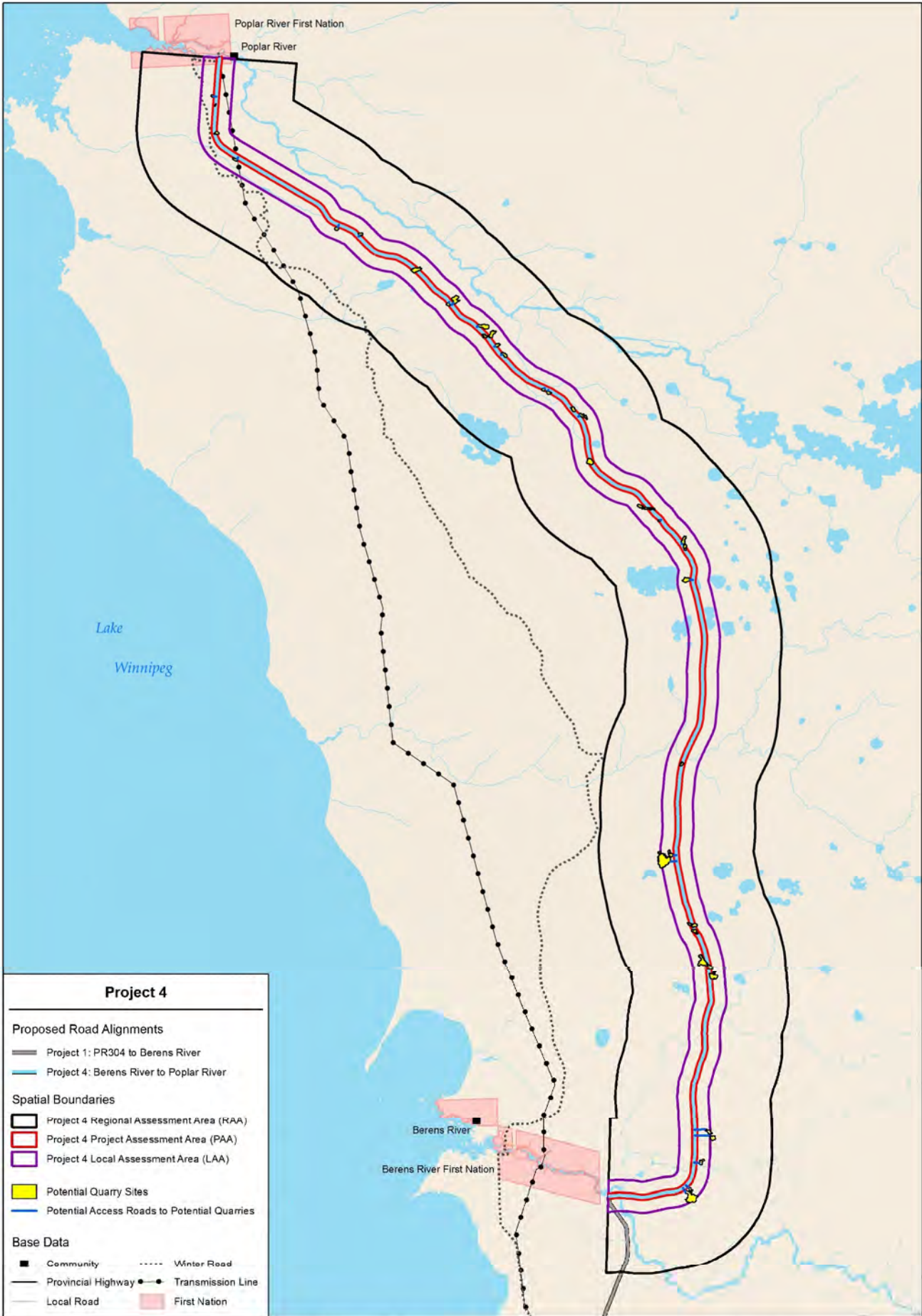
Vegetation – The general cover of plants growing on a landscape.

Vegetation Type – In phytosociology, the lowest possible level to be described.

Wetland – Land that is saturated with water long enough to promote hydric soils or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to wet environments.

¹All references Cauboue et al. 1996, unless otherwise noted.

APPENDIX II. Report Maps.





Photograph 17. Riparian shrub



Photograph 18. Meadow marsh

