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**Biophysical Assessment  
for the South of Wye Area  
Redevelopment Plan  
Project**

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**August 2020**

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## 1.0 INTRODUCTION

On December 5, 2019, Strathcona County Council approved the 2020 operating and capital budget which included funds to create the Campbelltown Heights, Wye Road Gardens and Ordze Park Area Redevelopment Plan and the South of Wye Road Area Redevelopment Plan Update. The ARP's have been combined into what is being called the South of Wye ARP Project. For the purposes of this document, these areas are herein referred to as the Area Redevelopment Plan (ARP) Subject Area. Area Redevelopment Plans are required under the MDP and meant to provide frameworks for future redevelopment for a defined area of land.

Strathcona County's MDP defines an Area Redevelopment Plan as *...the definition given by the Municipal Government Act summarized as a statutory plan adopted by a municipality by bylaw to provide a framework for the future redevelopment of a defined area of land.*

Prior to planning activities this biophysical assessment has been completed to characterize landscape features of the ARP Subject Area and makes conservation and mitigation recommendations for future development as required under Strathcona County's Statutory Plans Procedure and its Statutory Plans Terms of Reference.

### 1.1 Scope

The use of this biophysical assessment, as per Strathcona County Directive SER-009-032D, is to provide an overview of landscape features, wildlife presence and to identify areas for conservation based on their local, regional and provincial significance.

### 1.2 Objectives

In the interest of sustaining our natural environment, Strathcona County's goal is to protect the integrity of our heritage and natural resources while providing opportunities for appropriate forms of use that will benefit the community. The broad overview of landscape features and wildlife information provided in this report will be used to ensure that our goals, as laid out in Strathcona County's Strategic Plan are met. These goals include:

- maintain viable, sustainable populations of native plants and wildlife in their natural habitats;
- preserve our agricultural heritage;
- maintain heritage resources and values, whether it be a building, monument or landscape feature;
- identify a network of conservation areas to promote the sustainable use of native habitat and heritage resources to enhance quality of life for all;
- restore and rehabilitate degraded ecosystems, where practical;
- develop and implement management plans to ensure long term viability of the natural and heritage resources; and
- educate the public on conservation and sustainability.

These goals are further reinforced by Strathcona County's Conservation of Biological Diversity Policy (SER-009-041).

## 2.0 DEVELOPMENT CONTEXT

A biophysical assessment was conducted on the ARP Subject Area located on July 16, 2020. The objective of that assessment was to identify the natural features and their functions and values to

provide Strathcona County's Council, planners and stakeholders with information to make sustainable planning and development decisions.

## 2.1 Location

The ARP Subject Area consists of approximately 125 hectares (309 acres) of land located directly south of the westbound lanes of Wye Road and east of the Transportation Utility Corridor (Transportation Utility Corridor) within the NE 21-52-23 W4 and part of NW 22-52-23 W4 in Strathcona County.

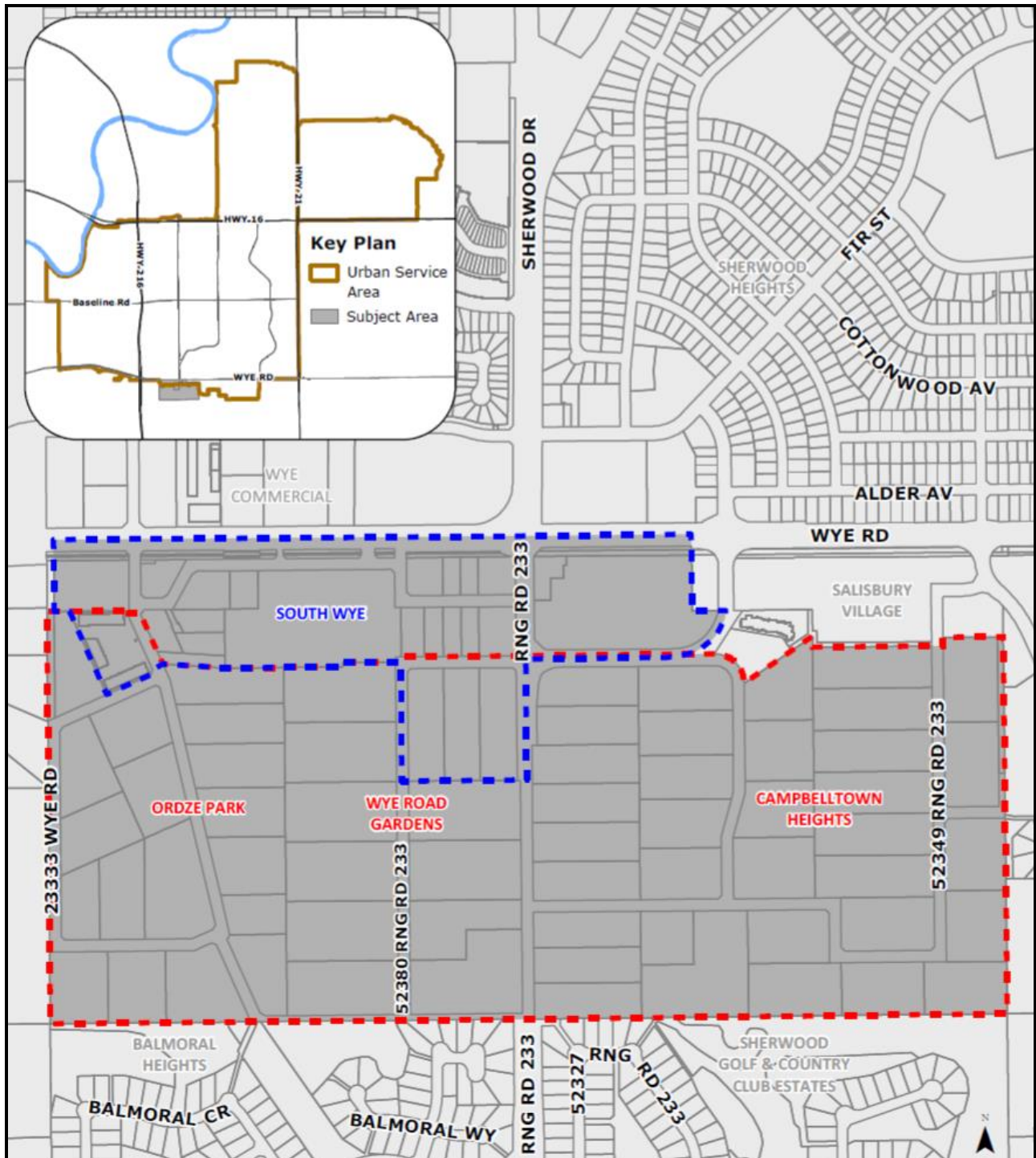


Figure 1: ARP Subject Area (outlined in red and blue)

## **2.2 Physiographic Description and Climate**

The Province of Alberta has been divided into specific units that reflect natural features through a process termed land classification. The land classification units are based on natural features – geology, landform, hydrology, soils, climate, vegetation and animals. All these natural features act as a unit and are termed an ecosystem.

The Natural Regions and Subregions classification, developed in 1977 (Natural Regions Committee 2006), is specifically for natural area reserve planning. The Ecoregions of Alberta classification developed in 1981 to provide a framework for integrated resource planning. The primary difference between the two systems is the emphasis on climate as a determinant of ecosystem structure as expressed by vegetation. The Natural Regions classification emphasizes landscape pattern, which reflects the geological factor while the Ecoregions of Alberta emphasizes vegetation as influenced by climatic characteristics. Elements of both classifications were combined in 1994 and the Natural Regions and Subregions classification emerged (Figure 2).

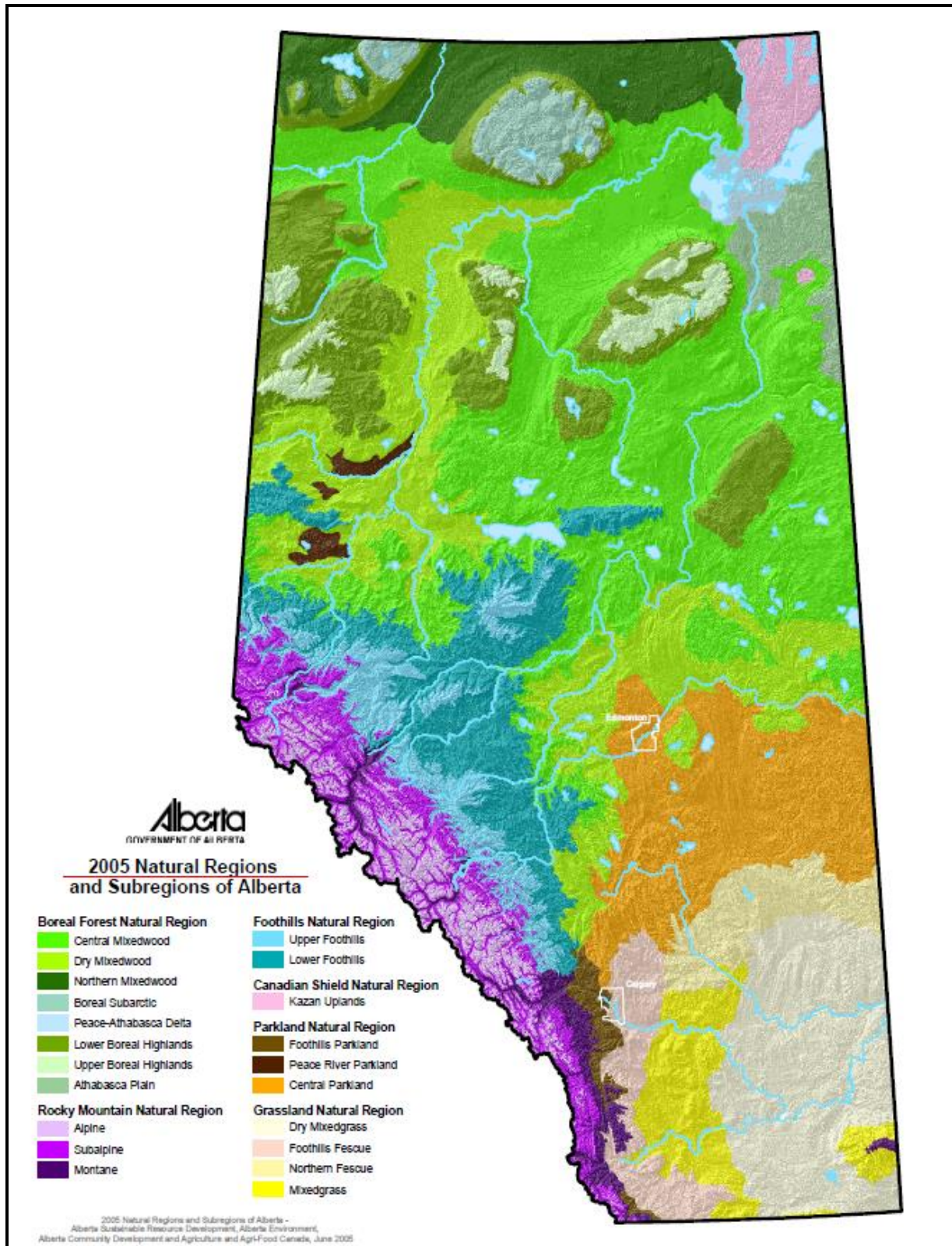


Figure 2: Natural Regions and Subregions of Alberta.

The purpose of the Natural Regions and Subregions classification is to account for the entire range of natural lands or ecosystem diversity in Alberta and is related to landscape and biodiversity conservation. This system has been adopted by Alberta Government. Based on the

Natural Regions and Subregions classification, the ARP Subject Area exists within the Parkland Natural Region, specifically the Central Parkland Subregion.

### 2.2.1 Parkland Natural Region – Central Parkland Subregion

The Parkland Natural Region can be applied to 10 to 15% of the landmass of Alberta. It forms a transition between the drier grasslands and the moister coniferous forests and is characterized by broad plains with deeply incised river valleys and rolling morainal terrain. The climate is influenced by prairie, boreal and mountain landscape and weather. A mix of aspen stands, shrubs and grasslands characterize the regional vegetation. There are three Subregions – Central, Foothills and Peace River.

The Central Parkland Subregion is characterized by level to undulating terrain with hummocky moraine landforms. Surficial deposits range from hummocky ground moraines to glaciolacustrine deposits. Moraines are the most widespread. Numerous permanent streams, all part of the Saskatchewan River system, cut across this Subregion. Lakes and wetlands are generally slightly to strongly saline. Soils are generally Black and Dark Brown Chernozems under grasslands and Dark Gray Chernozems and Luvisols under aspen forest stands.

The climate of this Subregion is subhumid, continental with short, cool summers and long, cold winters. The mean May to September temperature is 13°C with an average growing period of 90 days. Annual precipitation averages 350 mm, with the majority coming as rain in June and July. Winters are dry with approximately 60 mm of precipitation.

The typical vegetation within this Subregion is aspen (*Populus tremuloides*) occurring in pure and mixed stands, and balsam poplar (*Populus balsamifera*) occurring on moister substrates. The associated understory species consist of a high number of shrubs, specifically snowberry (*Symphoricarpos albus*), rose (*Rosa acicularis*), choke cherry (*Prunus virginiana*) and Saskatoon (*Amelanchier alnifolia*), often existing as belts of shrubs extending from the forest stands.

Wildlife characteristic to this Subregion include grassland and forest species. Migratory waterfowl are characteristic to the wetlands and associated uplands. Mammals include beaver (*Castor canadensis*), moose (*Alces alces*), hare (*Lepus spp.*), white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*).

## 2.3 Study and Assessment Methods

A desktop study of previous environmental reports was conducted in addition to review of historical aerial photographs. Summaries of the review of historical air photos and environmental reports can be found in section 3.0.

Site surveys were completed by Kiley Marchuk, Environmental Analyst, ATT. The survey was designed to determine site characteristics, through a floral and faunal survey and habitat identification. The survey was conducted in July 2020, at which time the plant communities and overall habitat were assessed. Wildlife observations were completed which included direct visual observations and indirect observations, such as browse and bedding indicators, vocalizations, tracks, and scat.

A significant limitation to the survey was access. Most lands within the ARP Subject Area are privately owned, therefore observations were made from county and publicly owned lands including the Transportation Utility Corridor, road right of ways and existing reserve lands. Due to access issues during the field assessment, the desktop review is the foundation for this report's conservation recommendations. The following map identifies parcels that were accessible in blue and the Transportation Utility Corridor in purple. The majority of field observations were made from road right of ways.





Although not a regulatory document, the Federal Policy on Wetland Conservation promotes wetland conservation through federal decision and responsibilities. The goals and objectives of the Federal Policy should be reflected in the management and development of the ARP Subject Area.

#### 2.4.2 *Provincial Environmental Protection and Enhancement Act*

The *Environmental Protection and Enhancement Act* (2000) aims to protect Alberta's air, land, and water by detailing what sort of activities require approvals and the associated requirements. The Act supports and promotes the "protection, enhancement and wise use of the environment" while simultaneously recognizing the importance of:

- environmental protection for human and nature benefit;
- integrating environmental protection with economic decisions throughout the planning stages;
- sustainable development;
- preventing and mitigating the environmental impact development, government policies, programs, and decisions;
- government leadership; and
- shared responsibility to protect, enhance and wisely use the environment.

Depending on the type of activities proposed for the ARP Subject Area, this Act should be consulted prior to any development commencing. Development should proceed in a way where the protection, enhancement and wise use of the environment is considered in conjunction with the proposed land use.

#### 2.4.3 *Provincial Municipal Government Act*

The Municipal Government Act (MGA) is responsible for providing the operational framework and governance model for all forms of local government in Alberta, including specialized municipalities. It also lays the basis for how municipalities operate, how their councils function and how residents work with their municipality. The MGA has three main areas of focus:

1. Governance and Administration;
2. Planning and Development; and
3. Assessment and Taxation.

The MGA enables municipalities to govern the development of lands within their boundaries in a manner that is logical, timely, economical and environmentally responsible. The MGA provides definitions and purpose of Environmental and Municipal Reserves which are as follows.

##### Environmental Reserve

*... a subdivision authority may require the owner of a parcel of land that is the subject of a proposed subdivision to provide part of that parcel of land as environmental reserve if it consists of*

- (a) a swamp, gully, ravine, coulee or natural drainage course,*
- (b) land that is subject to flooding or is, in the opinion of the subdivision authority, unstable, or*
- (c) a strip of land, not less than 6 metres in width, abutting the bed and shore of any body of water*

*.... environmental reserve must be left in its natural state or be used as a public park.*

*A subdivision authority may require land to be provided as environmental reserve only for one or more of the following purposes:*

- (a) to preserve the natural features of land referred to in subsection (1)(a), (b) or (c) where, in the opinion of the subdivision authority, those features should be preserved;*
- (b) to prevent pollution of the land or of the bed and shore of an adjacent body of water;*
- (c) to ensure public access to and beside the bed and shore of a body of water lying on or adjacent to the land;*
- (d) to prevent development of the land where, in the opinion of the subdivision authority, the natural features of the land would present a significant risk of personal injury or property damage occurring during development or use of the land.*

#### Municipal Reserve

*... a subdivision authority may require the owner of a parcel of land that is the subject of a proposed subdivision*

- (a) to provide part of that parcel of land as municipal reserve, school reserve or municipal and school reserve,*
- (b) to provide money in place of municipal reserve, school reserve or municipal and school reserve, or*
- (c) to provide any combination of land or money referred to in clauses (a) and (b).*

*Municipal reserve... may be used by a municipality or school board or by them jointly only for any or all of the following purposes:*

- (a) a public park;*
- (b) a public recreation area;*
- (c) school board purposes;*
- (d) to separate areas of land that are used for different purposes.*

#### 2.4.4 Provincial Public Lands Act

The *Public Lands Act* deals with two factors relating to the management of water bodies: the ownership of the beds and shores of permanent water bodies, and the prohibition of certain activities that may cause injury to the beds and shores of permanent water bodies. According to the act, the province owns the bed and shores of "all permanent and naturally occurring bodies of water, and all naturally occurring rivers, streams, watercourses and lakes".

The *Surveys Act* defines bed, bank and shore. The bank, being defined as the line along the upper limit of the bed and shore formed by the normal, continuous action of presence of surface water on the lands, limits the extent of the Province's ownership. This is a natural boundary between the bed and shore and privately owned land. The location of the bank is not affected by drought or flooding. The bed of a water body is defined as the land on which the water sits. The shore is defined as that part of the bed that is exposed when water levels are not at the normal level.

Section 54(1) of the Public Lands Act contains a general prohibition that no person shall do anything that:

- *...may injuriously affect watershed capacity;*
- *...is likely to result in injury to the bed and shore of any river, stream, watercourse, lake or other body of water or land in the vicinity of that public land; or*
- *...is likely to result in soil erosion.*

Any unauthorized use of public land may be subject to a variety of penalties, including fines, disposition cancellation, ministerial orders to restore disturbed areas, or legal action imposed penalties.

Due to the sensitive nature of shore resources, most activities on the bed and shore require at least two provincial approvals through the Public Lands Act and the Water Act. Conditions are placed on all authorizations: (1) to ensure that compatible activities and resources are used properly, (2) to limit the chance of degrading aquatic and shore environments, and where necessary, (3) to mitigate, reclaim or restore an area where disturbance is unavoidable.

#### 2.4.5 Provincial Water Act

The *Water Act* is the primary legislation that deals with water and water management. Water management is necessary in order to address demands on aquatic resources while ensuring that a clean abundant supply of water is available, including for its own protection. There are multiple scales at which water management can occur, whether involving a small area, such as lake management, or at a larger area, such as an entire watershed. Regardless of the level, public participation is a necessity in successfully managing water.

Ownership, activity regulation, water allocation and use, and the licensing and approval system are all components described in the Act. Through the Water Act the Crown owns the resource of water. The Water Act applies over a water body's flood plain, bed and shore. The Water Act works to safeguard the aquatic environment which has been defined as:

*...the components of the earth related to, living in or located in or on water or the beds or shores of a water body, including but not limited to*

- (i) All organic and inorganic matter, and*
- (ii) Living organisms and their habitat, including fish habitat, and their interacting natural systems.*

An approval is required under Section 36 of the Act for all activities that may impact water and the aquatic environment. It is an offence under the Water Act to commence or continue an activity unless an approval or other authorization under the Act has been issued; to contravene a term or condition of an approval or license; to contravene a water management order; or contravene an enforcement order. Penalties may include fines, water management orders, remedial orders, court orders and civil remedies.

#### 2.4.6 Alberta Wetland Policy

The Alberta Wetland Policy looks at the entirety of Alberta, including crown land, white and green zones, and addresses all classes of wetlands. The new classification system was introduced in 2015 and describes five classes: bogs, fens, marshes, shallow open water, and swamps. These five classes align with the Canadian Wetland Classification System. Once categorized into one of five classes, wetlands are divided into forms based on vegetation structure. The forms are then divided into types based on the length of time that surface water is at or above the surface, along with basic water characteristics (acidity and salinity) as per Stewart and Kantrud classes for prairie wetlands.

Currently wetlands cover approximately 18% of the province, however it is estimated that 64% of wetlands in the White Area have been lost or impacted. The Alberta Wetland Policy in conjunction with the Water Act aim to protect the remaining wetland on private and public lands through the avoidance of damage or destruction of wetlands, the minimization of impact of wetlands, and/or the compensation for reclamation or development of wetlands.

Wetlands have a wide diversity of functions, including water quality improvement, flood and drought mitigation, shoreline protection, recreation activities, and habitat. Wetlands are defined as

*land that is saturated with water long enough to promote the formation of water altered soils, growth of water tolerant vegetation, and biological activity adapted to a wet environment.*

The Policy strives to

*maintain wetland areas in Alberta such that the ecological, social, and economic benefits that wetlands provide are maintained, thereby helping to ensure that Albertans have healthy watershed that provide safe and secure drinking water supplies, healthy aquatic ecosystems, and reliable, quality water supplies for a sustainable economy.*

However, the Alberta Wetland Policy recognizes that wetlands vary in value due to differences in form, function, use, and location. Criteria include biodiversity, water quality improvement, flood reduction, human value, and abundance. The relative value of a wetland will impact wetland management decisions.

#### 2.4.7 Municipal Development Plan

The County's Municipal Development Plan (MDP) Bylaw 20-2017 provides a comprehensive long-term land use policy framework that guides present and projected growth and development over the next 20 years and beyond.

The ARP Subject Area is part of the Compact Development Policy Area and the Country Residential Policy Area. Strathcona County's objectives for the Compact Development Areas are as follows.

1. Contain compact, mixed-use development;
2. Contribute to the evolution of complete communities;
3. Incorporate walkability and areas for social interaction; and
4. Integrate green building and green infrastructure.

For the Country Residential Areas the County's objectives are below.

1. Provides rural living opportunities;
2. Includes efficiently designed developments that occur in an orderly manner;
3. Respects and connects natural and rural landscapes; and
4. Balances incompatible land uses.

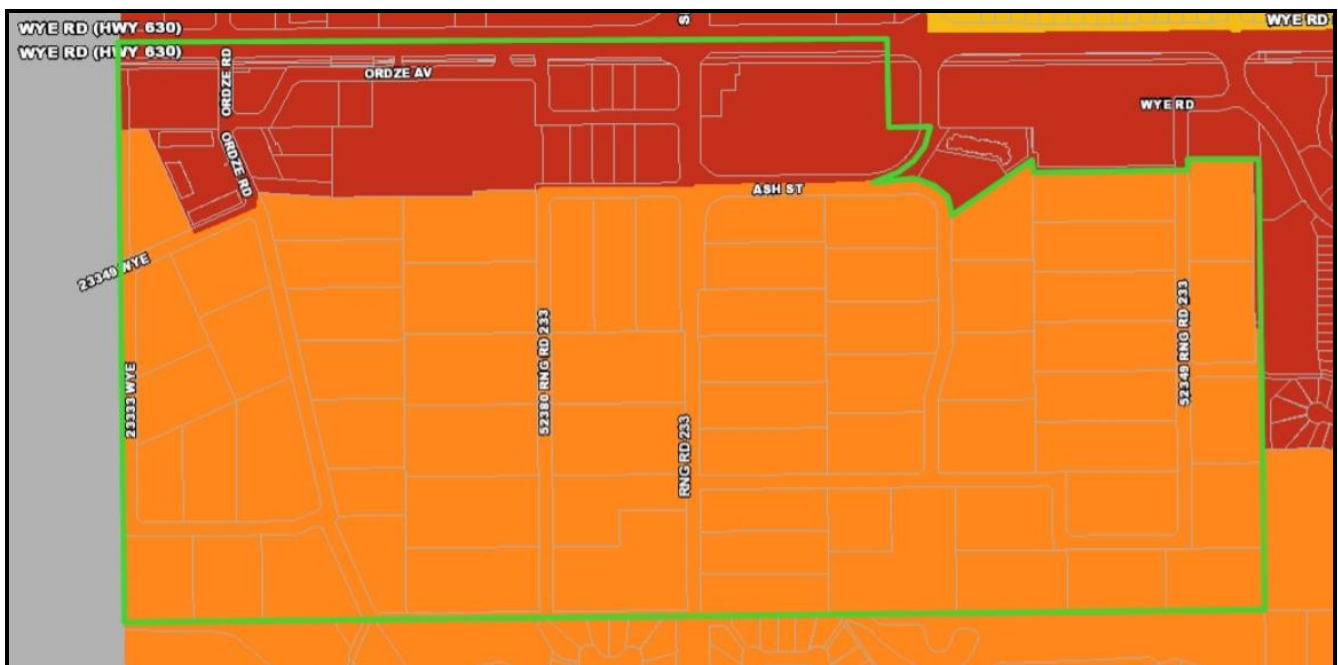


Figure 4: Municipal Development Plan Policy Areas. Compact Development Policy Area in red, Country Residential Policy Area in orange and ARP Subject Area outlined in green.

#### *2.4.8 Municipal Land Use Bylaw*

Strathcona County's Land Use Bylaw (LUB) regulates the use, conservation and development of land, habitat, buildings and signs in pursuit of the objectives of Strathcona County's Municipal Development Plan.

The LUB's objectives are to maintain and enhance residents' quality of life by providing opportunities to attain individual and community aspirations to conserve and enhance the environmental quality in Strathcona County and to foster planned, efficient, economical and beneficial development that provides a diversity of choice, lifestyle and environment.

#### *2.4.9 Municipal Conservation of Biological Diversity Policy*

Strathcona County understands that biological diversity is fundamental to sustaining life by supplying critical ecosystem services such as food provisioning, air and water purification, flood and drought control, nutrient cycling, and climate regulation.

This policy (SER-009-041) is intended to guide conservation decision-making and act as a foundation for municipal actions to protect the air, water, land and biodiversity.

#### *2.4.10 Municipal Wetland Conservation Directive*

Strathcona County recognizes wetlands as important municipal infrastructure components for environmental, economic and social sustainability and will conserve their value for present and future generations. Conservation of the wetlands in urban and rural development areas is a priority for environmental, economic and human health.

The purpose of the Wetland Conservation Directive SER-009-036D is to ensure that Strathcona County has procedures designed to conserve wetlands within the County during planning and development through No Net Loss. The goal of No Net Loss is to balance the loss of wetland functions through rehabilitation of former degraded wetlands or enhancement of healthy, functioning wetlands. As a last resort, compensation for lost functions will be sought through creation of wetlands where there was none before. The Policy strives to complement provincial legislation (*Water Act* and *Public Lands Act*) and the Federal Policy on Wetland Conservation.

#### *2.4.11 Municipal Biophysical Assessment Directive*

In order to meet the conservation goals under the County's Strategic Plan and Conservation of Biological Diversity Policy, Biophysical Assessment Directive SER-009-032D was created. A biophysical assessment studies the biological and physical elements of an ecosystem, including geology, topography, hydrology and soils. The County requires this assessment of future development areas during the Area Concept Plan, Area Structure Plan, and/or subdivision application. The resulting report is used to prioritize and dedicate Environmental Reserve, Environmental Reserve Easement, Municipal Reserve, Conservation Reserve and Conservation Easement lands based on municipal, community and environmental needs.

#### *2.4.12 Municipal Light Efficient Community Policy*

The intent of Strathcona County's Light Efficient Community Policy (SER-009-038) is to reduce light pollution and preserve natural dark nighttime skies by promoting the use of light only where and where it is needed and at appropriate levels.

Through the application of this policy, residents and wildlife will benefit by increased quality of life and access to the nighttime environment.

### 3.0 DESKTOP STUDY RESULTS

#### 3.1 Historical Aerial Photograph Review Summary

Selected aerial photographs dating from 1950 to the most current photograph (2019) were available in Strathcona County Planning & Development Services Department. The table below is a brief summary of the entire area using the large-scale aerial photographs that were available.

**Table 1: Aerial Photo Summary**

<b>Year</b>	<b>Description</b>
<b>1950</b>	Approximately 75% of the land has been cleared and is being used for agriculture. There are three relatively large remnant tree stands present in addition identifiable vegetation along a Goldbar Creek. Several wetlands and drainage corridors can be seen within the subject area however, due to the age and quality of the air photo it is hard to determine the permanency of these features. Two homesteads, one on each quarter, can be identified.
<b>1976</b>	The subject area has been developed from agriculture into what appears to be country residential, at least forty-five residences can be identified. Sections of Goldbar Creek and three relatively large wetlands can be seen. The remnant tree stands can identified but residences have cleared small areas within them. It appears that at least half of the residences have done landscaping work including tree planting that appears to delineate subdivided lot boundaries.
<b>1987</b>	The subject area is similar to the previous air photo with the exception that at five more residences have been constructed. It appears that some residences have constructed wetlands or dugouts. The previously identified wetlands, creek and drainage can be more easily seen throughout the subject area.
<b>1996</b>	The subject area is similar to the previous air photo with the exception some of the residences along the north boundary have been removed and commercial buildings and their access roads have been constructed. Part of Goldbar Creek appears to have been buried by the commercial development. The remnant forested areas and landscaping appear to be larger and denser than the 1976 and 1987 air photos.
<b>2001</b>	The subject area is similar to the previous air photo with the exception that more residences along the north boundary have been removed and more commercial buildings and accesses have been added. Drainage and wetlands appear significantly wetter than in the previous air photo. More of Goldbar Creek, near the northwest portion of subject are, has been buried by commercial development.
<b>2003</b>	The subject area is similar to the previous air photo with the exception that wetlands appear larger and wetter than in previous photos and more commercial buildings have been constructed near the north boundary.
<b>2005</b>	The subject area is similar to the previous air photo.
<b>2007</b>	The subject area is similar to the previous air photo with the exception that the wetlands and drainage corridors have faded back slightly and appear smaller and drier than in the previous air photo.
<b>2009</b>	The subject area is similar to the previous air photo.
<b>2011</b>	The subject area is similar to the previous air photo.
<b>2013</b>	The subject area is similar to the previous air photo.
<b>2015</b>	The subject area is similar to the previous air photo.
<b>2017</b>	The subject area is similar to the previous air photo.
<b>2019</b>	The subject area is similar to the previous air photo with the exception three more commercial buildings have been constructed near the north boundary.

### 3.2 Previous Environmental Assessments

#### 3.2.1 Priority Environment Management Areas (Spencer Environmental Management Services Ltd. 2005)

In 2005, Strathcona County commissioned an Assessment of Environmental Sensitivity and Sustainability in Support of the MDP. The objective was to quantify and map environmental sensitivity of Strathcona County lands for future sustainable planning and development.

Landscape Management Areas were prioritized based on relative abundance of natural features and environmental sensitivity of lands. The abundance of resources is represented by one of four categories:

1. Protected Areas (Federal or Provincial designation)
2. High Sensitivity (> 3 natural resources)
3. Medium Sensitivity (1 – 2 natural resources), and
4. Low Sensitivity (0 natural resources).

The ARP Subject Area has areas of High Sensitivity and Medium Sensitivity. Approximately three quarters of the lands have High Sensitivity. Areas of High Sensitivity include Goldbar Creek, drainage, wetlands, riparian areas and remnant forest stands. The remainder of the lands are considered Medium sensitivity, these lands have been more impacted by development and generally do not contain features such as wetlands.

In this case, when relative abundance of natural resources is high or medium, development requires specific management to plan sustainable communities and conserve essential natural features.



Figure 5: Priority Environment Management Areas. Blue indicates high environmental sensitivity and yellow indicates medium sensitivity.

### 3.2.2 *Prioritized Landscape Ecology Assessment of Strathcona County (Geowest Environmental Consultants Ltd. 1997)*

In 1996, Strathcona County identified the need for a comprehensive identification of natural features and wildlife habitats that can be applied consistently across the County landscape. The overall goal of the landscape ecology study was to complete a prioritized landscape and wildlife habitat inventory to be incorporated into the County’s planning process. The resulting Prioritized Landscape Ecology Assessment is used to guide new development and subdivisions and to direct future habitat and landscape restoration projects.

The Prioritized Landscape Ecology Assessment identifies the ARP Subject Area as having primarily upland habitat units with those areas further classified as upland poplar and upland forest with small wetlands. Priority habitat generally corresponds to the non-arable lands that include the creeks, tributaries, riparian areas and the adjacent uplands as well as wetlands and remnant tree stands that provide wildlife corridor habitat.

This report also recognizes that ungulates rely on the riparian areas as dispersion and migratory corridors. To increase the chance of long term wildlife survival, the county needs to incorporate remaining habitat into local and regional land use plans and not simply designate fragmented patches as parks or protected areas. To achieve this it recommends the following:

- Increase the size and quality of the habitat patches in order to increase the local population size and to decrease the risk of extinction;
- Increase the number of habitat patches in order to improve the possibility for exchange and re-colonization, and to lower the stochastic (random) extinction of the regional population; and
- Decrease the resistance of the landscape by including corridors and reducing the effect of movement barriers, thus enhancing the possibility of dispersal.

Below is the Prioritized Landscape Ecology Assessment’s Wildlife Habitat Unit Map.



Figure 6: Prioritized Landscape Ecology Assessment’s Wildlife Habitat Units. Dark green indicates upland poplar forest and upland forest with small wetlands.



### 3.2.3 Part of the North Saskatchewan River Basin Regional Groundwater Assessment (Hydrogeological Consultants Ltd. 2001)

Groundwater in the study area comes mainly from the Bearpaw aquifer which is generally 80 to 100 meters thick and less than 100 meters below the surface. There is an estimated 50+ meters cubed of water, per section, being pumped from this aquifer daily.

Within the County, groundwater in surficial deposits is generally high in total dissolved solids and sodium concentrations. The average total dissolved solids is 1,164 mg/L and the average sodium concentration is 219 mg/L, both are above the Guidelines for Canadian Drinking Water Quality.

Most of the area south of Wye Road is considered an aquifer recharge area.

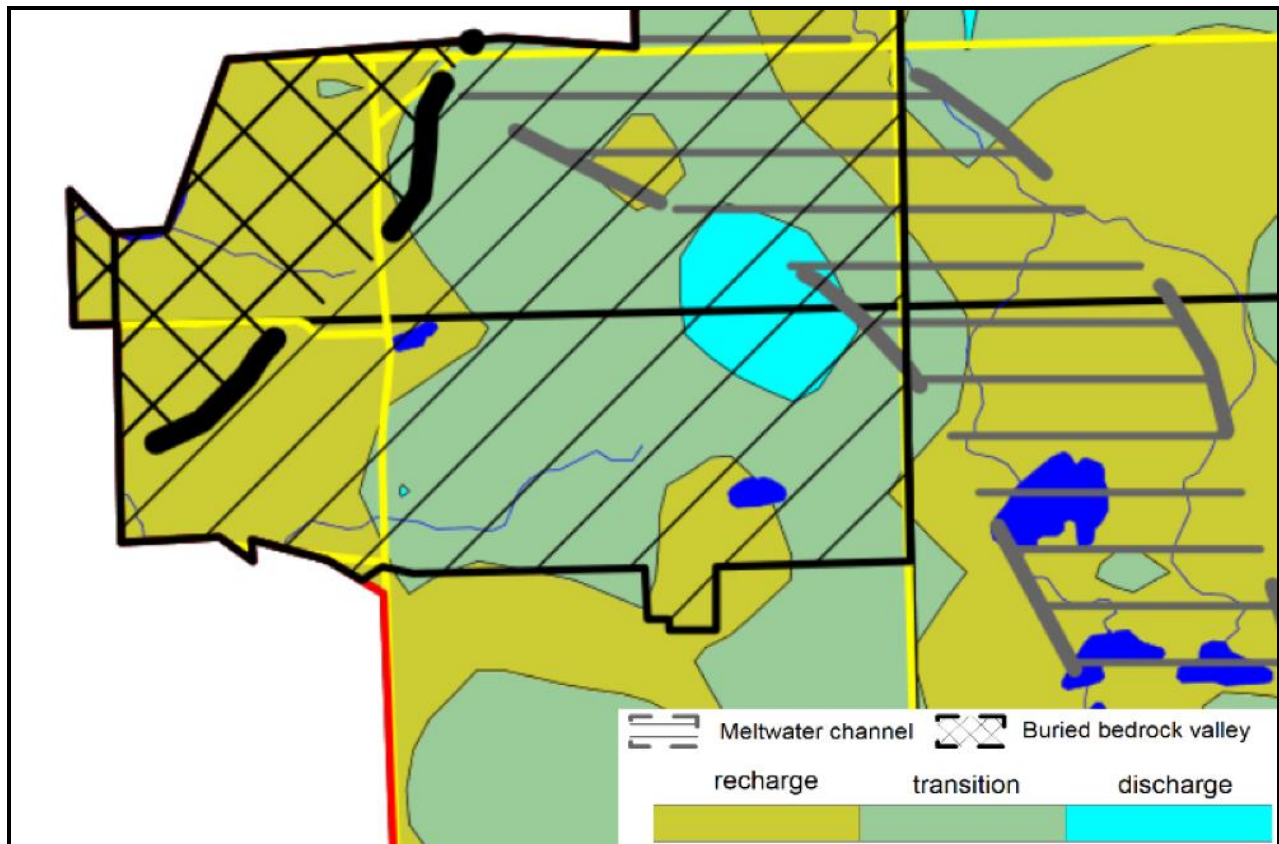


Figure 7: Groundwater Recharge, Discharge and Transition Zones. The yellow horizontal line is HWY 16 and the vertical red and yellow line is HWY 216. The yellow represents recharge areas, the green represents transition areas, and the light blue indicates discharge areas. The dark blue indicates water bodies.

### 3.2.4 Alberta Conservation Information Management System (ACIMS)

A search of the Alberta Conservation Information Management System on July 6, 2020 did not identify any occurrences of sensitive or non-sensitive plants or wildlife species.

A lack of records does not necessarily mean that there are no rare elements in the ARP Subject Area, it may indicate that no inventory or survey has been undertaken in that area. Detailed vegetation inventories will still need to be completed prior to Area Structure Plan and subdivision planning.

### 3.2.5 Alberta Fisheries & Wildlife Management Information System (FWMIS)

A search of the FWMIS (Fish and Wildlife Management Information System) found that surveys had been conducted on Goldbar Creek in 2013 and 2017 less than 300 m from the ARP Subject Area. Goldbar Creek is a recurring stream, Brook Stickleback (*Culeae inconstans*) was the only fish species observed and wood frogs (*Lithobates sylvaticus*) were also identified.

The FWMIS also indicated the ARP Subject Area is within the Bald Eagle and Sharp-tailed Grouse Survey Areas. These Survey Areas indicate the expected range that sensitive wildlife species are considered to live within. This information is used to identify sensitive wildlife features and where mitigation strategies are to be used to mitigate development effects on sensitive wildlife species.

### 3.3 Topography

The terrain is considered hummocky with low relief. Elevations ranges from 738 m along the east boundary sloping to 714 m in northwest corner. The landscape generally slopes towards Goldbar Creek, which flows to the west-northwest as elevations taper down westward towards the Transportation Utility Corridor and North Saskatchewan River Valley.



Figure 8: Topography. Contours in orange and Goldbar Creek and its tributary in blue.

### 3.4 Surficial and Bedrock Geology

The surficial geology of the Study Area consists of glaciofluvial deposits from the Late Cretaceous Edmonton Group. The glaciofluvial deposits are outwash sand composed of coarse to medium-grained sand with pebbles and small gravel lenses (Bayrock and Hughes 1962). The bedrock geology of the Lower Horseshoe Canyon Formation consists of shale, sandstone, coal, bentonite, limestone and ironstone (Green 1972) that were deposited by running water and till.

### 3.5 Soil

The ARP Subject Area is located in the Thick Black Soil Zone of Alberta and the dominant soils are Dark Gray Luvisols with some Orthic Dark Gray Chernozems. Gleysolic soils may be found in

depressional area and wetlands. These soils are developed on medium textured till or on very fine textured material over medium to moderately fine textured till parent materials.

The area contains three classes of soils as per the Canada Land Inventory's Soil Capability for Agriculture maps.

- Class 1 - Soils in this class have no significant limitations in use for crops.
- Class 2 - Soils in this class have moderate limitations that reduce the choice of crops or require moderate conservation practices.
- Class 4 - Soils in this class have severe limitations that restrict the range of crops or require special conservation practices or both.

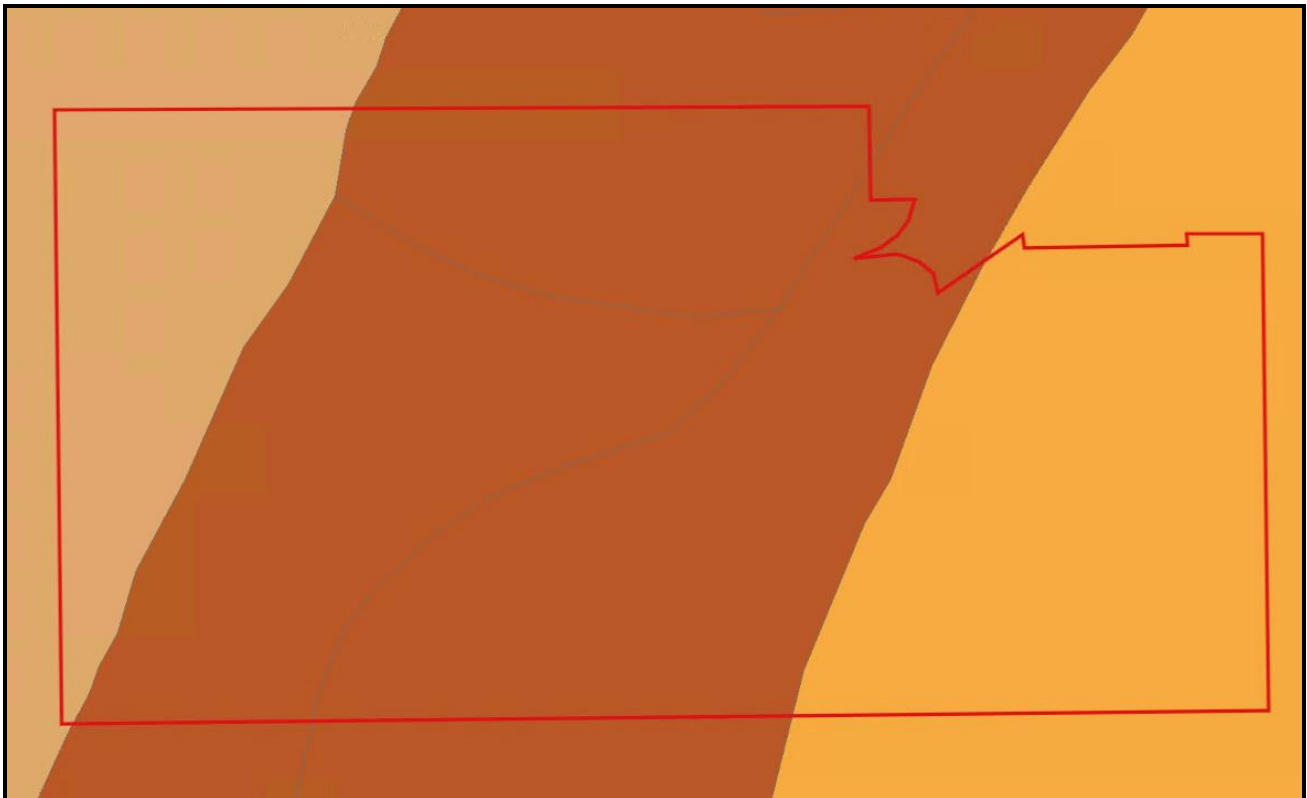


Figure 9: Canada Land Inventory Soil Capability for Agriculture. Tan represents Class 1 soils, brown represents Class 2 soils, and light orange represents Class 4 soils.

While the ARP Subject Area contains moderate amounts of Class 1 and 2 agricultural soils an Agricultural Impact Assessment is not warranted due to the amount of landscape disturbance that has occurred over the 50+ years.

### 3.6 Hydrology

The ARP Subject Area lies within the Beaverhill subwatershed which is part of the North Saskatchewan River watershed. The Beaverhill subwatershed covers approximately 440,000 hectares of land. Although there is some basic data about types of wildlife, vegetation and landforms, there is a lack of useful information about the health and current status of the subwatershed and the creeks within it.

Surface water drainage is generally directed towards Goldbar Creek (Figure 7) and its tributary which then flow northwesterly into the North Saskatchewan River. Goldbar Creek has periodic and seasonal periods of low flow.

Groundwater flows west-northwest towards the North Saskatchewan River with probable estimates yields of 0.08-0.38 litres per second (R. Bibbly 1974).

### 3.7 Wetlands

#### 3.7.1 Wetland Definition

Wetlands are lands where saturated soils are the dominant factor in plant and wildlife diversity. The most important feature distinguishing wetlands from other habitats is that the soils are consistently or periodically saturated with or covered by water. The saturated soils and/or standing water creates physiological problems for vegetation and wildlife and typically only those plants and animals adapted to these specific conditions are dominant (hydrophytes).

“Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.” (Cowardin et al. 1979).

As defined by the province, wetlands are low-lying areas of land covered by water long enough to support aquatic plants and wildlife for part of their life cycle. Wetlands can be peatlands or non-peatlands but can also be characterized by their permanence. Peatlands, as the name suggests, accumulate peat, which is the partially decomposed organic vegetation. Non-peatlands do not accumulate peat.

#### 3.7.2 Wetland Function, Values and Benefits

Wetland functions and benefits refer to the natural processes associated with wetland ecosystems, including ecological, social, and economic functions.

Wetlands have been called “nature’s kidneys” due to their ability to filter entities such as bacteria, nutrients, sediments and metals. They can also mitigate flood and drought effects due to their ability to retain water. Other ecological functions of wetlands include water recharge, habitat for wildlife, natural sinks for pollutants, nutrient source for connected waters, and soil and water conservation. Wetlands and the associated drainage corridors are often integrated into engineered hard infrastructure termed “green infrastructure” or incorporated into low impact development best management practices.

Recreational activities such as fishing, hunting, bird watching, hiking, and photography are examples of the social value of wetlands. The productivity of wetlands, leading to fish populations and recreational activities is one example of how wetlands exhibit economic benefits as well.

#### 3.7.3 Alberta Wetland Classification System

The Alberta Wetland Classification System recognizes five **classes** of wetland: bogs, fens, marshes, shallow open water and swamps (ESRD, 2015). These five classes align with the Canadian Wetland Classification System. Once categorized into one of five classes, wetlands are divided into **forms** based on vegetation structure (wooded-coniferous, wooded-mixedwood, wooded-deciduous, shrubby, graminoid and aquatic). The forms are then divided into **types** based on the length of time that surface water is at or above the surface, along with basic water characteristics (acidity and salinity) as per Stewart and Kantrud classes for prairie wetlands.

**Table 2. Alberta Wetland Classification System.**

<b>Class</b>	<b>Form</b>	<b>Type</b>
<b>Bog</b>	Wooded-coniferous	Acidic, freshwater
	Shrubby, graminoid	
<b>Fen</b>	Wooded-coniferous	Poor fen, freshwater
	Shrubby	Moderately-rich fen, freshwater
	Graminoid	Extremely-rich fen, freshwater to slightly brackish
<b>Marsh</b>	Graminoid	Temporary hydroperiod; freshwater to slightly brackish
		Seasonal hydroperiod; freshwater to moderately brackish
		Semi-permanent hydroperiod; freshwater to brackish
<b>Shallow Open Water</b>	Submersed and/or floating aquatic	Seasonal hydroperiod; freshwater to moderately brackish
	Unvegetated	Semi-permanent hydroperiod; freshwater to subsaline
		Permanent hydroperiod; slightly brackish to subsaline
<b>Swamp</b>	Wooded-coniferous	Intermittent hydroperiod; saline
	Wooded-mixedwood	Temporary; freshwater to slightly brackish
	Wooded-deciduous	Seasonal; freshwater to slightly brackish
	Shrubby	Seasonal; moderately brackish to sub-saline

*3.7.4 Wetlands in the ARP Subject Area*

Similar to the results of the aerial photograph review, wetlands are a previously identified landscape feature across the ARP Subject Area. According to the Alberta Merged Wetland Inventory, there are marshes and open water wetlands present. While this inventory is not entirely inclusive, it gives a good idea of what wetlands may exist within the area.

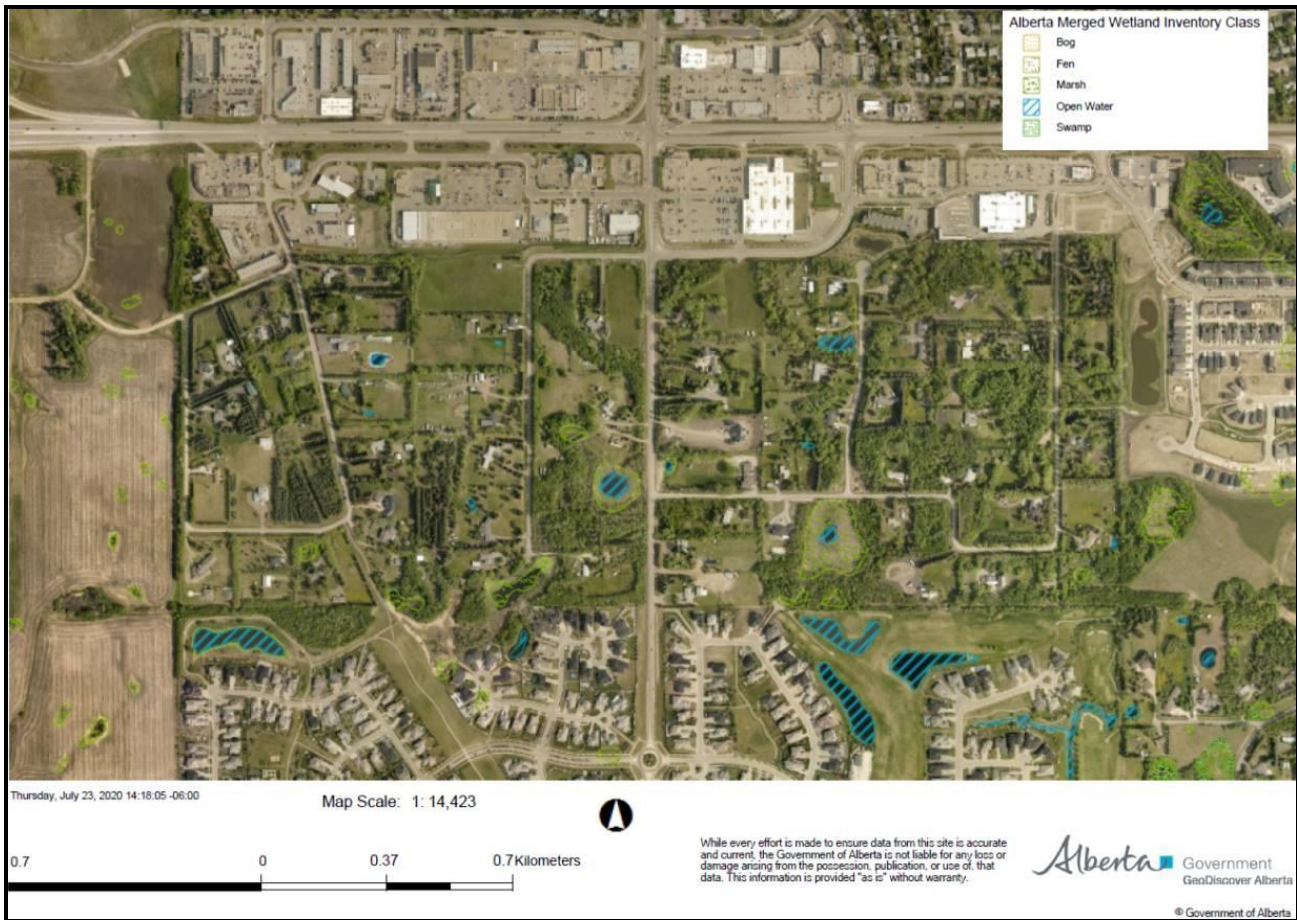


Figure 10: Alberta Merged Wetland Inventory.

## 4.0 FIELD RECONNAISSANCE

Field reconnaissance took place in July 2020. Due to access constraints, most parcels were observed from roadsides and existing reserve lands. While species lists were compiled, they should not be considered comprehensive. Observations specific to habitat complexity and connectivity were also made.

### 4.1 Landscape Characteristics

The landscape consists of gently rolling, hummocky areas that have been disturbed by residential development and areas near the north boundary that have been graded and developed for commercial uses. The ARP Subject Area had previously been mostly cleared for agriculture but significant pockets of remnant forest stands, wetlands, and Goldbar Creek and its associated drainage are also present. Parts of Goldbar Creek and its tributaries have been significantly altered by farming and development, alteration include channelization and realignment in some areas. Some properties show signs of naturalization and significant tree planting has been completed throughout the ARP Subject Area.

### 4.2 Vegetation & Wildlife

Approximately 75% of the ARP Subject Area has been cleared of vegetation primarily for residential and commercial development and roads. However, remnant tree stands, naturalized areas and landscape planting have resulted in wildlife habitat including habitat patches, linear/edge habitat and stepping stone corridor habitat.

Habitat patches can be remnant or natural habitats that offer wildlife species the resources they need throughout their lifecycle including breeding habitat, stopover habitat and predation refuge. Within the ARP Subject Area significant habitat patches include three relatively large wetlands which can be identified in Figure 10.

Edge habitats are the boundaries where two different types of habitat meet, in this case, where remnant forest stands (which act as shelterbelts) meet the cultivated Transportation Utility Corridor and landscaped areas adjacent to the ARP Subject Area.

Wildlife corridors are links that allow wildlife to travel between different habitats. Wildlife move between large unfragmented habitat areas to locate suitable mates, dens and to exploit seasonal fluctuations in climate and food. Corridors provide various wildlife and vegetation species the opportunity to expand their home range, which provides the genetic diversity that is required to ensure sustainable populations over large areas. In this case, the wildlife corridor is primarily suited to the smaller species address below and includes upland forest remnants along the southern boundary of the ARP Subject Area.

Overall, the diversity of landscape and plant communities across the ARP Subject Area is moderately high. The remaining mature and regenerating young deciduous forest stands and landscape planting provide habitat for species like deer and coyotes, while the wetlands offer habitat for reptiles, amphibians, and birds. The priority habitat occurs primarily within remnant tree stands, wetlands and drainage within the ARP Subject Area.

The deciduous forest stands were primarily established or re-establishing communities of aspen (*Populus tremuloides*) and poplar (*Populus balsamifera*) with some paper birch (*Betula papyrifera*). A diverse shrub and forb understory, including, saskatoon (*Amelanchier alnifolia*), red osier dogwood (*Cornus stolonifera*), rose (*Rosa acicularis*), beaked hazelnut (*Corylus cornuta*) and pin cherry (*Prunus pensylvanica*) was common throughout. The largest forest stands were associated with wetland and creek complexes, supplementing their function as habitat patches.

Several wildlife species were observed directly or indirectly during the site reconnaissance. Direct wildlife sightings of significance included boreal chorus frogs (*Pseudacris maculate*), American Bittern (*Botaurus lentiginosus*), red-winged blackbird (*Agelaius phoeniceus*) and various ducks (*Anas spp.*). Indirect sightings of significance included coyote (*Canis latrans*) (scat), deer (*Odocoileus spp.*) (scat) and tropical migrant songbirds (vocalizations).



Photo 1: Relatively large wetland on the east portion of the ARP Subject Area.

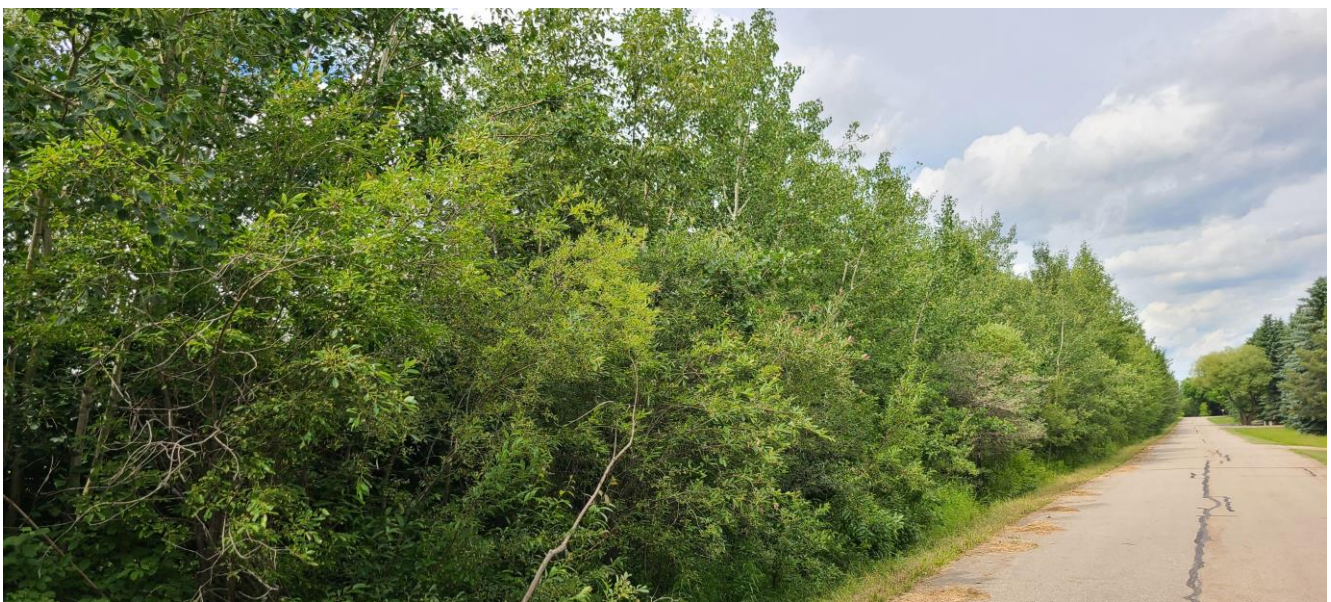


Photo 2: Edge habitat within the ARP Subject Area bordering the Transportation Utility Corridor.





Photo 3: Goldbar Creek on the east side of the ARP Subject Area.



Photo 4: Goldbar Creek and naturalized vegetation on the east side of the ARP Subject Area.



Photo 4: Wetland covered with duckweed and surrounded by woody vegetation on the west side of ARP Subject Area.

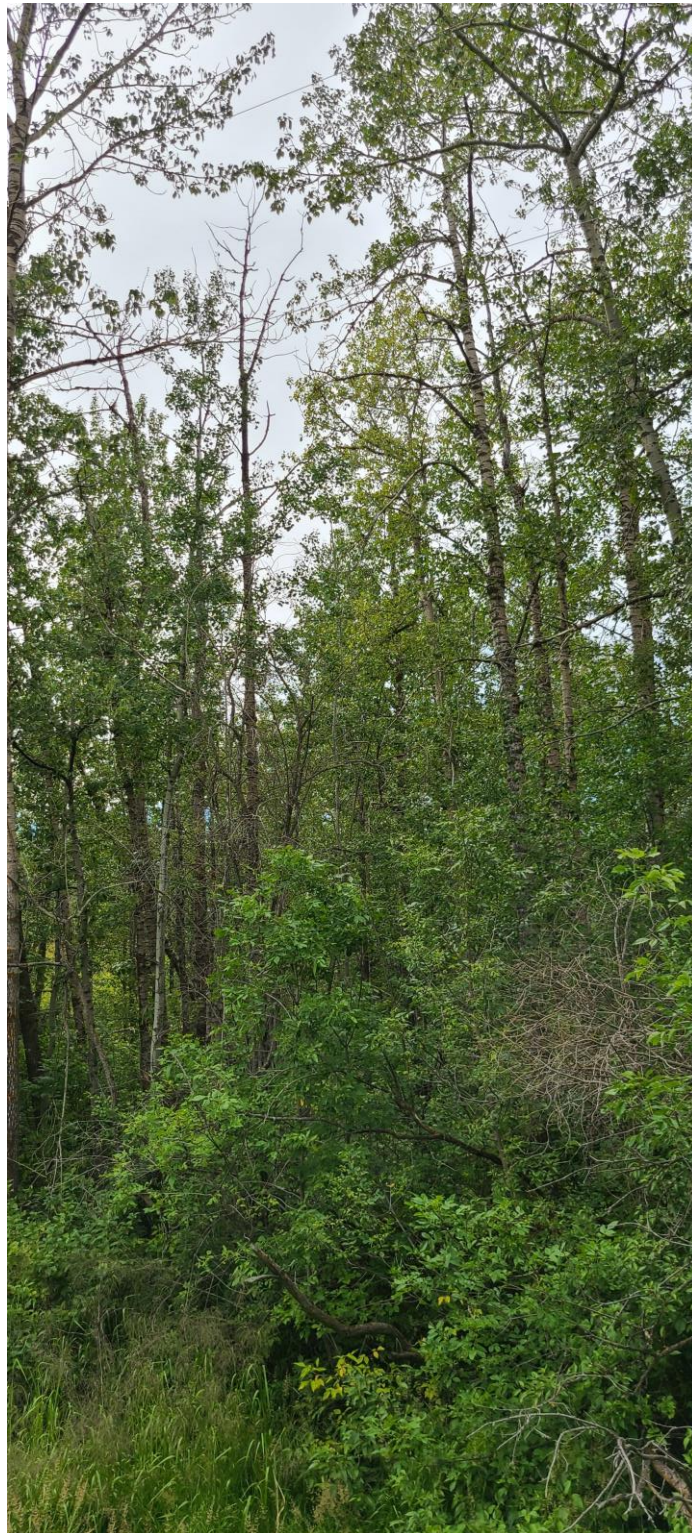


Photo 6: Mature remnant upland poplar stand with small wetlands in east side of the ARP Subject Area.

## 5.0 CONSERVATION RECOMMENDATIONS

In addition to lands already owned and/or conserved by Strathcona County, indicated in blue in Figure 11 below, the following is a list of conservation recommendations for the ARP Subject Area.

1. Wetlands with distinct connections to Goldbar Creek and upland habitats are present and should be prioritized for conservation. Conservation may include incorporating wetlands in stormwater management facilities through best management practices and low impact development practices or dedicating wetlands as Environmental Reserve during subdivision if possible. This will support biodiversity and effective wetland and stormwater management functions.
2. Goldbar Creek and its immediate upland areas should be considered for conservation. Conservation may include incorporating the creek into stormwater management facilities through best management practices and low impact development practices or dedicating the creek as Environmental Reserve during subdivision if possible. Crown claim assessments will also be needed to determine if the province will claim all or part of Goldbar Creek where redevelopment impacts are expected.
3. If Municipal Reserves are owing, they should be dedicated to conserving existing wildlife corridors and edge habitat as shown in the figure below. This will allow wildlife to move through the ARP Subject Area from other internal and adjacent habitats while limiting habitat fragmentation.
4. Topsoil should be conserved during development and reused for future landscaping, clubroot testing must be performed prior to development to ensure compliance with Alberta's *Agricultural Pest Act*.
5. In line with Strathcona County's MDP and Conservation of Biological Diversity Policy, respect and connect natural and rural landscapes and integrate green building and green infrastructure, while considering steps that can be taken to restore degraded habitats.
6. Site specific Tree Protection Plans will be needed as applications come forward to redevelop as per Strathcona County's Tree Conservation Directive (SER-009-042D).
7. Pre-development bird surveys will need to include provincial survey guidelines specific to sharp-tailed grouse and bald eagles.
8. Site specific biophysical assessments should be undertaken prior to future development to confirm or add to the conservation recommendations of this report.

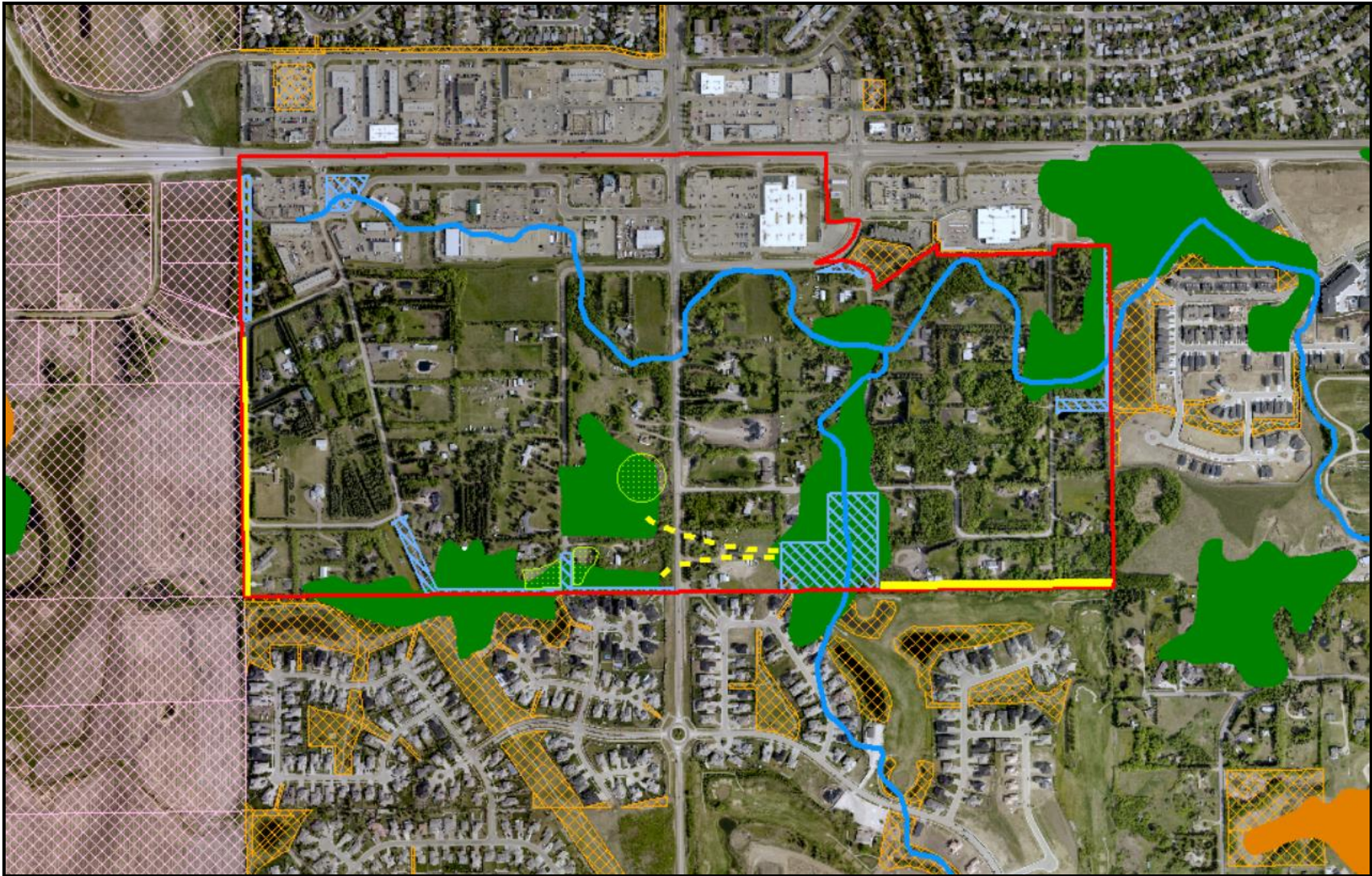


Figure 11: Conservation Recommendations. Blue indicates areas already owned by Strathcona County, solid yellow represents edge and wildlife corridor habitat that should be considered for future Municipal Reserve. Dashed yellow shows where habitat restoration should be considered to provide better ecological connectivity. Dotted yellow indicates significant wetlands and solid blue symbolizes Goldbar Creek and it's tributary areas that should be incorporated into stormwater management or taken as Environmental Reserve. Solid green indicates upland poplar forest and upland forest with small wetlands, as per PLEA, within these areas there are oppurtunities to restore Goldbar Creek and it's tributary which could improve water quality and habitat. Areas in orange hatching outside of the ARP Subject Area are also owned by Strathcona County and are complimentary to conservation recommendations. Light pink hatching indicates the Transportation Utility Corridor.

## 6.0 LIMITATIONS AND QUALIFICATIONS

In conducting the investigation and rendering our conclusions, Strathcona County gives the benefit of its best judgment based on its experience and in accordance with generally accepted professional standards for this type of investigation. This report was submitted with the best information to date and on the information provided. The conclusions made within this report are a professional opinion, not a certification of the sites environmental condition, no other warranty, expressed or implied is made. This report has been prepared for the exclusive use of Strathcona County for the purposes of assessing the current state of the natural areas at the ARP Subject Area. Any use which any third party makes of this report, or any reliance on or decisions to be made on it, are the responsibility of such third parties. Strathcona County accepts no responsibility for damages, if any, suffered by any other third party as a result of decisions made or actions based on this report.

Our conclusions are limited by the following:

- Site assessments were completed at the time specified; and
- The investigation was limited to those parameters specifically outlined in this report.
- Most observations were made from the roadsides as access was not available to the majority of the study area.

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July 2020

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Biologist  
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July 2020

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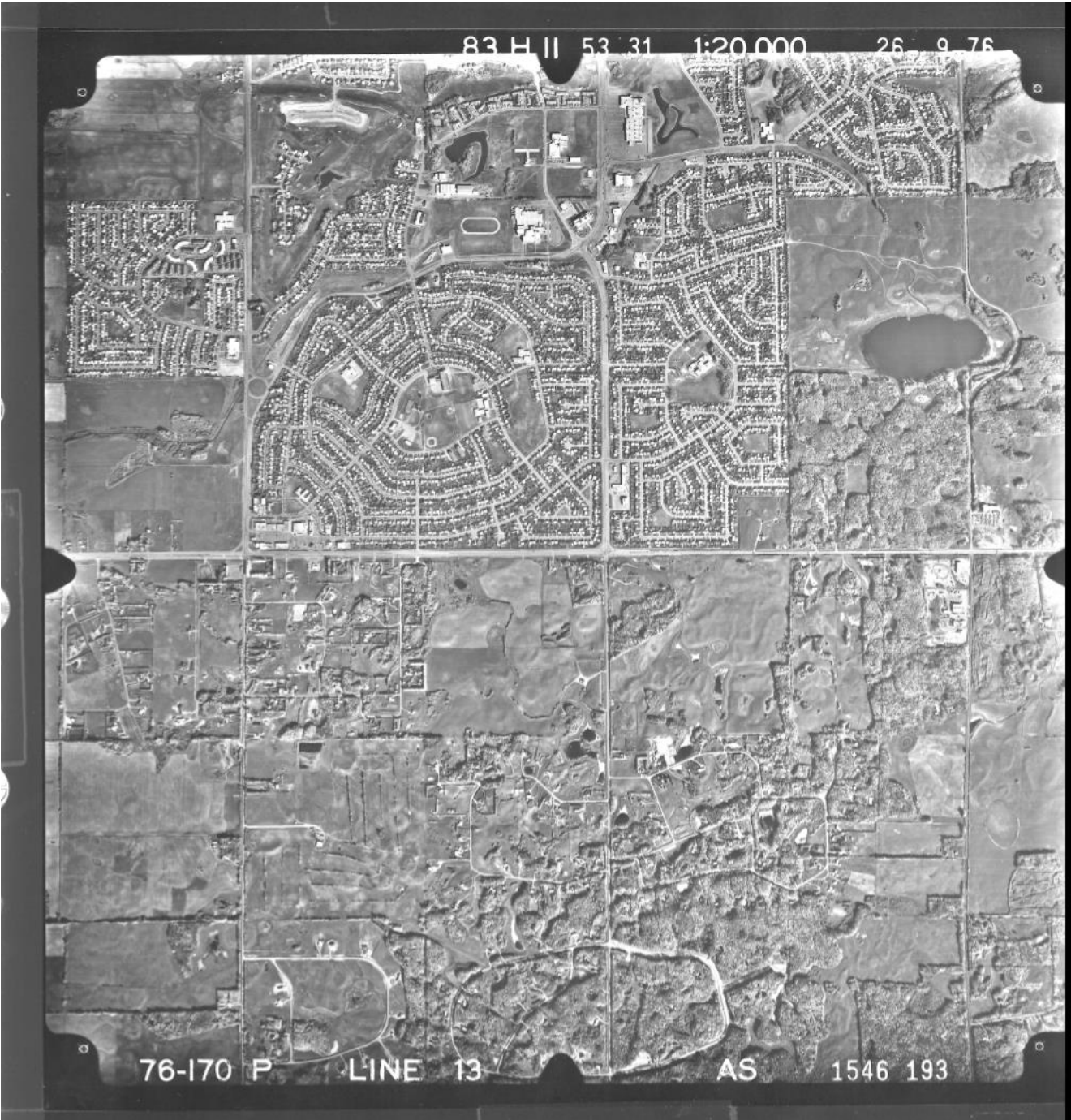
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**APPENDIX A – HISTORICAL AERIAL PHOTOS**



Historical Aerial Photo (1950)





Historical Aerial Photo (1976)



Historical Aerial Photo (1987)



Historical Aerial Photo (1996)



Historical Aerial Photo (2001)



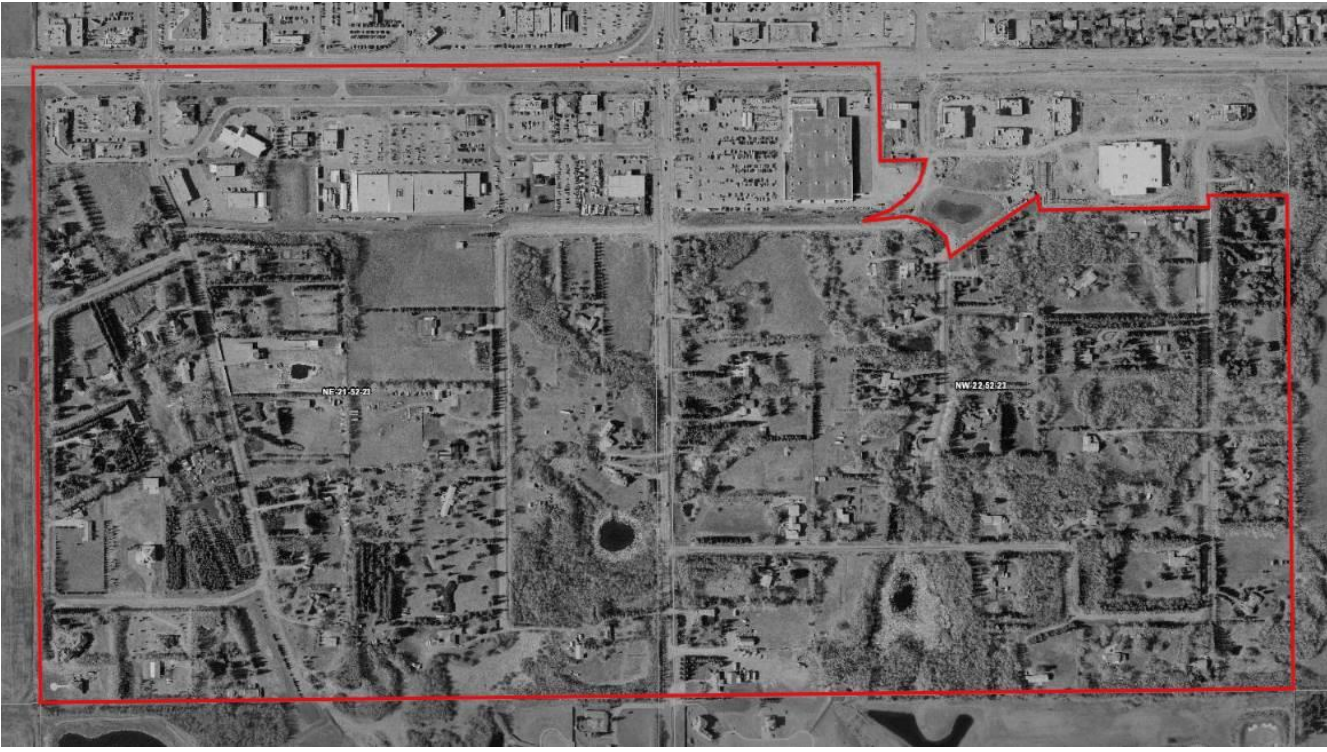
Historical Aerial Photo (2003)



Historical Aerial Photo (2005)



Historical Aerial Photo (2007)



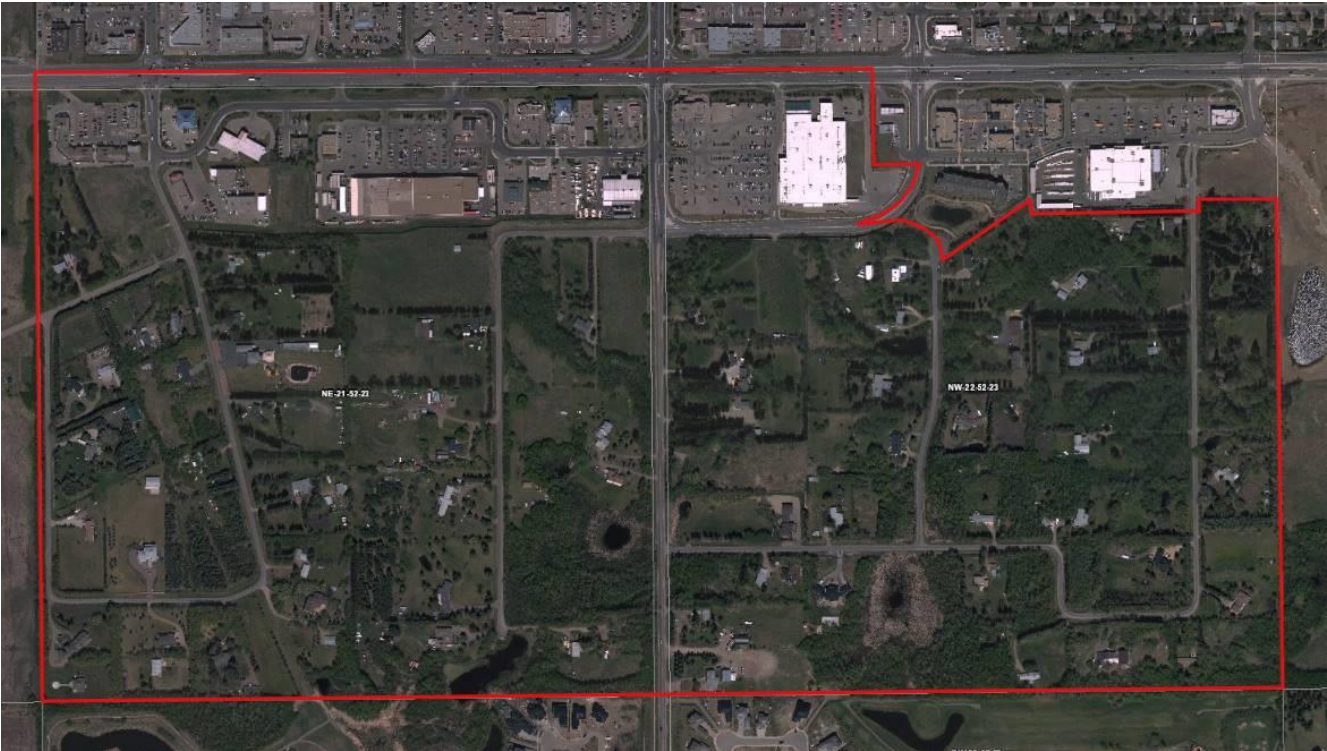
Historical Aerial Photo (2009)



Historical Aerial Photo (2011)



Historical Aerial Photo (2013)



Historical Aerial Photo (2015)



Historical Aerial Photo (2017)



Historical Aerial Photo (2019)



## APPENDIX B – SPECIES LISTS

### Wildlife

Class	Order	Family	Genus species	common name	observed
<b>UNGULATES</b>					
Mammalia	Artiodactyla	Cervidae	<i>Odocoileus spp.</i>	deer	scat
<b>CARNIVORES</b>					
Mammalia	Carnivora	Canidae	<i>Canis latrans</i>	coyote	scat
<b>RODENTS</b>					
Mammalia	Rodentia	Muridae	<i>Microtis pennsylvanicus</i>	meadow vole	visual
Mammalia	Rodentia	Muridae	<i>Ondatra zibethicus</i>	muskrat	visual
Mammalia	Rodentia	Sciuridae	<i>Tamiasciurus hudsonicus</i>	red squirrel	vocalization
<b>AMPHIBIANS</b>					
Amphibia	Anura	Ranidae	<i>Rana sylvatica</i>	wood frog	vocalization

### Birds

Class	Order	Family	Genus species	common name	observed
<b>DUCKLIKE BIRDS</b>					
Aves	Anseriformes	Anatidae	<i>Anas clypeata</i>	Northern Shoveler	visual
Aves	Anseriformes	Anatidae	<i>Anas discors</i>	Blue-winged Teal	visual
Aves	Anseriformes	Anatidae	<i>Anas platyrhynchos</i>	Mallard	visual
Aves	Anseriformes	Anatidae	<i>Anas strepera</i>	Gadwall	visual
Aves	Anseriformes	Anatidae	<i>Aythya affinis</i>	Lesser Scaup	visual
Aves	Anseriformes	Anatidae	<i>Branta canadensis</i>	Canada goose	vocalization
Aves	Anseriformes	Anatidae	<i>Bucephala clangula</i>	Common Goldeneye	visual
Aves	Gruiformes	Rallidae	<i>Fulica americana</i>	American Coot	vocalization
<b>SHOREBIRDS &amp; SEABIRDS</b>					
Aves	Charadriiformes	Laridae	<i>Larus delawarensis</i>	Ring-billed Gull	visual
Aves	Charadriiformes	Laridae	<i>Larus pipixcan</i>	Franklin's Gull	visual
Aves	Charadriiformes	Laridae	<i>Sterna hirundo</i>	Common Tern	visual
<b>NONPASSERINE LAND BIRDS</b>					
Aves	Piciformes	Picidae	<i>Dryocopus pileatus</i>	Pileated Woodpecker	tree cavities
Aves	Piciformes	Picidae	<i>Picoides spp.</i>	Woodpecker	tree cavities
<b>PASSERINE BIRDS</b>					
Aves	Passeriformes	Corvidae	<i>Corvus brachyrhynchos</i>	American Crow	visual
Aves	Passeriformes	Corvidae	<i>Pica pica</i>	Magpie	visual
Aves	Passeriformes	Emberizidae	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	visual
Aves	Passeriformes	Emberizidae	<i>Melospiza melodia</i>	Song Sparrow	vocalization
Aves	Passeriformes	Emberizidae	<i>Spizella pallida</i>	Clay-colored Sparrow	visual
Aves	Passeriformes	Emberizidae	<i>Spizella passerina</i>	Chipping Sparrow	visual
Aves	Passeriformes	Hirundinidae	<i>Tachycineta bicolor</i>	Tree Swallow	visual
Aves	Passeriformes	Muscicapidae	<i>Turdus migratorius</i>	American Robin	vocalization
Aves	Passeriformes	Paridae	<i>Parus atricapillus</i>	Black-capped Chickadee	visual
Aves	Passeriformes	Passeridae	<i>Passer domesticus</i>	House Sparrow	visual

## Plants

Division	Subdivision	Class	Family	Genus species	common name
<b>TREES</b>					
Spermatophyta	Angiospermae	Dicotyledoneae	Aceraceae	<i>Acer negundo</i>	Manitoba maple
Spermatophyta	Angiospermae	Dicotyledoneae	Betulaceae	<i>Betula papyrifera</i>	white birch
Spermatophyta	Angiospermae	Dicotyledoneae	Oleaceae	<i>Fraxinus pennsylvanica</i>	green ash
Spermatophyta	Gymnospermae	-	Pinaceae	<i>Larix laricina</i>	tamarack/larch
Spermatophyta	Gymnospermae	-	Pinaceae	<i>Picea glauca</i>	white spruce
Spermatophyta	Gymnospermae	-	Pinaceae	<i>Picea mariana</i>	black spruce
Spermatophyta	Gymnospermae	-	Pinaceae	<i>Pinus contorta</i>	lodgepole pine
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Populus balsamifera</i>	balsam poplar
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Populus tremuloides</i>	aspen poplar
Spermatophyta	Angiospermae	Dicotyledoneae	Fagaceae	<i>Quercus macrocarpa</i>	bur oak
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix pentandra</i>	laurel leaf willow
Spermatophyta	Angiospermae	Dicotyledoneae	Ulmaceae	<i>Ulmus americana</i>	american elm
<b>SHRUBS</b>					
Spermatophyta	Angiospermae	Dicotyledoneae	Betulaceae	<i>Alnus crispa</i>	green alder
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Amelanchier alnifolia</i>	saskatoon
Spermatophyta	Angiospermae	Dicotyledoneae	Ericaceae	<i>Andromeda glaucophylla</i>	bog-rosemary
Spermatophyta	Angiospermae	Dicotyledoneae	Ericaceae	<i>Arctostaphylos uva-ursi</i>	bearberry
Spermatophyta	Angiospermae	Dicotyledoneae	Betulaceae	<i>Betula occidentalis</i>	water birch
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Caragana arborescens</i>	common caragana
Spermatophyta	Angiospermae	Dicotyledoneae	Rhamnaceae	<i>Ceanothus spp.</i>	lilac
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Cotoneaster acutifolia</i>	cotoneaster
Spermatophyta	Angiospermae	Dicotyledoneae	Cornaceae	<i>Cornus stolonifera</i>	red osier dogwood
Spermatophyta	Angiospermae	Dicotyledoneae	Betulaceae	<i>Corylus cornuta</i>	beaked hazelnut
Spermatophyta	Angiospermae	Dicotyledoneae	Elaeagnaceae	<i>Eleagnus commutata</i>	silverberry/wolf-willow
Spermatophyta	Angiospermae	Dicotyledoneae	Ericaceae	<i>Gaultheria hispidula</i>	creeping snowberry
Spermatophyta	Gymnospermae	-	Cupressaceae	<i>Juniperus communis</i>	ground juniper
Spermatophyta	Gymnospermae	-	Cupressaceae	<i>Juniperus horizontalis</i>	creeping juniper
Spermatophyta	Angiospermae	Dicotyledoneae	Ericaceae	<i>Kalmia polifolia</i>	northern bog-laurel
Spermatophyta	Angiospermae	Dicotyledoneae	Caprifoliaceae	<i>Lonicera dioica</i>	twining honeysuckle
Spermatophyta	Angiospermae	Dicotyledoneae	Caprifoliaceae	<i>Lonicera involucrata</i>	bracted honeysuckle
Spermatophyta	Angiospermae	Dicotyledoneae	Ericaceae	<i>Oxycoccus microcarpus</i>	small bog-cranberry
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Potentilla fruticosa</i>	shrubby cinquefoil
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Prunus pensylvanica</i>	pin cherry
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Prunus virginiana</i>	choke cherry
Spermatophyta	Angiospermae	Dicotyledoneae	Saxifragaceae	<i>Ribes americanum</i>	wild black currant
Spermatophyta	Angiospermae	Dicotyledoneae	Saxifragaceae	<i>Ribes glandulosum</i>	skunk currant
Spermatophyta	Angiospermae	Dicotyledoneae	Saxifragaceae	<i>Ribes hudsonianum</i>	northern black currant
Spermatophyta	Angiospermae	Dicotyledoneae	Saxifragaceae	<i>Ribes lacustre</i>	black gooseberry
Spermatophyta	Angiospermae	Dicotyledoneae	Saxifragaceae	<i>Ribes oxycanthoides</i>	northern gooseberry
Spermatophyta	Angiospermae	Dicotyledoneae	Saxifragaceae	<i>Ribes triste</i>	swamp red currant
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Rosa acicularis</i>	prickly rose
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Rubus idaeus</i>	wild raspberry
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix bebbiana</i>	beaked willow

Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix discolor</i>	pussy willow
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix exigua</i>	narrow-leaved willow
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix glauca</i>	grey-leaved willow
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix lutea</i>	yellow willow
Spermatophyta	Angiospermae	Dicotyledoneae	Salicaceae	<i>Salix spp.</i>	willow
Spermatophyta	Angiospermae	Dicotyledoneae	Elaeagnaceae	<i>Shepherdia canadensis</i>	Canada buffaloberry
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Sorbus scopulina</i>	western mountain ash
Spermatophyta	Angiospermae	Dicotyledoneae	Caprifoliaceae	<i>Symphoricarpos albus</i>	common snowberry
Spermatophyta	Angiospermae	Dicotyledoneae	Caprifoliaceae	<i>Symphoricarpos occidentalis</i>	buckbrush
Spermatophyta	Angiospermae	Dicotyledoneae	Vacciniaceae	<i>Vaccinium caespitosum</i>	dwarf bilberry
Spermatophyta	Angiospermae	Dicotyledoneae	Vacciniaceae	<i>Vaccinium myrtilloides</i>	blueberry
Spermatophyta	Angiospermae	Dicotyledoneae	Vacciniaceae	<i>Vaccinium vitis-idaea</i>	bog cranberry
Spermatophyta	Angiospermae	Dicotyledoneae	Caprifoliaceae	<i>Viburnum edule</i>	low bush cranberry
Spermatophyta	Angiospermae	Dicotyledoneae	Caprifoliaceae	<i>Viburnum opulus</i>	high bush cranberry
<b>GRASSES, SEDGES &amp; RUSHES</b>					
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Agropyron cristatum</i>	crested wheatgrass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Agropyron dasystachyum</i>	northern wheat grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Agropyron repens</i>	quack grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Agropyron trachycaulum</i>	slender wheat grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Beckmannia syzigachne</i>	slough grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Bromus inermis ssp.</i>	brome
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Calamagrostis canadensis</i>	reed grass
Spermatophyta	Angiospermae	Monocotyledoneae	Cyperaceae	<i>Carex spp.</i>	sedge
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Deschampsia caespitosa</i>	tufted hair grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Elymus innovatus</i>	hairy wild rye
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Festuca spp.</i>	fescue
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Hordeum jubatum</i>	foxtail barley
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Koeleria cristata</i>	june grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Phalaris arundinacea</i>	reed canary grass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Phleum pratense</i>	timothy
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Poa pratensis</i>	Kentucky bluegrass
Spermatophyta	Angiospermae	Monocotyledoneae	Gramineae	<i>Schloacoa</i>	spangle top grass
<b>WILDFLOWERS</b>					
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Achillea millefolium</i>	yarrow
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Achillea sibirica</i>	Siberian yarrow
Spermatophyta	Angiospermae	Dicotyledoneae	Ranunculaceae	<i>Actea rubra</i>	baneberry
Spermatophyta	Angiospermae	Dicotyledoneae	Ranunculaceae	<i>Anemone canadensis</i>	Canada anemone
Spermatophyta	Angiospermae	Dicotyledoneae	Araliaceae	<i>Aralia nudicaulis</i>	sarsaparilla
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Aster conspicuus</i>	showy aster
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Aster laevis</i>	smooth aster
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Astragalus canadensis</i>	Canadian milk-vetch
Spermatophyta	Angiospermae	Dicotyledoneae	Campanulaceae	<i>Campanula rotundifolia</i>	common harebell
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Chrysanthemum leucanthemum</i>	ox-eye daisy
Spermatophyta	Angiospermae	Dicotyledoneae	Umbelliferae	<i>Cicuta maculata var. angustifolia</i>	water-hemlock
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Cirsium arvense</i>	Canada thistle
Spermatophyta	Angiospermae	Dicotyledoneae	Cornaceae	<i>Cornus canadensis</i>	bunchberry

Spermatophyta	Angiospermae	Dicotyledoneae	Onagraceae	<i>Epilobium angustifolium</i>	fireweed
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Fragaria glauca</i>	wild strawberry
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Geum macrophyllum</i>	large-leaved avens
Spermatophyta	Angiospermae	Dicotyledoneae	Umbelliferae	<i>Heracleum lanatum</i>	cow-parsnip cream-colored vetchling
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Lathyrus ochroleucus</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Scrophulariaceae	<i>Linaria vulgaris</i>	yellow toadflax
Spermatophyta	Angiospermae	Dicotyledoneae	Primulaceae	<i>Lysimachia ciliata</i>	fringed loosestrife wild lily-of-the- valley scentless chamomile
Spermatophyta	Angiospermae	Monocotyledoneae	Liliaceae	<i>Maianthemum canadense</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Matricaria maritima</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Matricaria matricarioides</i>	pineapple-weed
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Medicago sativa</i>	alfalfa
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Melilotus albus</i>	white sweet clover
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Melilotus officinalis</i>	yellow sweet clover
Spermatophyta	Angiospermae	Dicotyledoneae	Labiatae	<i>Mentha arvensis</i>	wild mint
Spermatophyta	Angiospermae	Dicotyledoneae	Boraginaceae	<i>Mertensia paniculata</i>	tall lungwort arrow-leaved coltsfoot
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Petasites sagittatus</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Plantaginaceae	<i>Plantago major</i>	common plantain
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Potentilla anserina</i>	silverweed
Spermatophyta	Angiospermae	Dicotyledoneae	Cruciferae	<i>Rorippa islandica</i>	marsh yellow cress
Spermatophyta	Angiospermae	Dicotyledoneae	Polygonaceae	<i>Rumex occidentalis</i>	western dock
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Senecio vulgaris</i>	common groundsel
Spermatophyta	Angiospermae	Dicotyledoneae	Umbelliferae	<i>Sium suave</i>	water-parsnip star-flowered false solomon's-seal
Spermatophyta	Angiospermae	Monocotyledoneae	Liliaceae	<i>Smilacina stellata</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Solidago canadensis</i>	golden rod perennial sow- thistle common chickweed
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Sonchus arvensis</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Caryophyllaceae	<i>Stellaria media</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Tanacetum vulgare</i>	tansy
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Taraxacum officinale</i>	dandelion
Spermatophyta	Angiospermae	Dicotyledoneae	Ranunculaceae	<i>Thalictrum venulosum</i>	veiny meadow rue
Spermatophyta	Angiospermae	Dicotyledoneae	Compositae	<i>Tragapogon dubius</i>	goat's beard
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Trifolium repens</i>	white clover
Spermatophyta	Angiospermae	Dicotyledoneae	Uryicaceae	<i>Urtica dioica</i>	stinging nettle
Spermatophyta	Angiospermae	Dicotyledoneae	Leguminosae	<i>Vicia americana</i>	american vetch
<b>AQUATICS</b>					
Spermatophyta	Angiospermae	Monocotyledoneae	Lemnaceae	<i>Lemna minor</i>	common duckweed
Spermatophyta	Angiospermae	Dicotyledoneae	Menyanthaceae	<i>Menyanthes trifoliata</i>	buck-bean
Spermatophyta	Angiospermae	Monocotyledoneae	Polygonaceae	<i>Polygonum amphibium</i>	water smartweed thread-leaved pondweed Richardson's pondweed
Spermatophyta	Angiospermae	Monocotyledoneae	Zosteraceae	<i>Potamogeton filiformis</i>	
Spermatophyta	Angiospermae	Monocotyledoneae	Zosteraceae	<i>Potamogeton richardsonii</i>	
Spermatophyta	Angiospermae	Dicotyledoneae	Rosaceae	<i>Potentilla palustris</i>	marsh cinquefoil yellow water- buttercup arum-leaved arrowhead common great bulrush
Spermatophyta	Angiospermae	Dicotyledoneae	Ranunculaceae	<i>Ranunculus gmelinii</i>	
Spermatophyta	Angiospermae	Monocotyledoneae	Alismaceae	<i>Sagittaria cuneata</i>	
Spermatophyta	Angiospermae	Monocotyledoneae	Cyperaceae	<i>Scirpus lacustris</i>	
Spermatophyta	Angiospermae	Monocotyledoneae	Typhaceae	<i>Typha latifolia</i>	cattail
<b>FERNS &amp; ALLIES</b>					
Pteridophyta	-	-	Equisetaceae	<i>Equisetum spp.</i>	horsetail

<b>MOSSES, LICHENS &amp; LIVERWORTS</b>					
Bryophyta	-	-	-	<i>Climacium dendroides</i>	common tree moss
Bryophyta	-	-	-	<i>Hylocomium splendens</i>	stair-step moss
Lichen	-	-	-	<i>Icamadophila ericetorum</i>	fairy puke
Bryophyta	-	-	-	<i>Pylaisiella polyantha</i>	stocking moss
Bryophyta	-	-	-	<i>Sphagnum spp.</i>	peat moss
Lichen	-	-	-	<i>Xanthoria falax</i>	powdered orange lichen