



# RICHARD ST. BARBE BAKER AFFORESTATION AREA

## Natural Area Management Plan

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PREPARED BY



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&

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# EXECUTIVE SUMMARY

## LEGISLATIVE CONTEXT

The RSBBA is subject to the policies and regulations of the City of Saskatoon (City). The highest-order planning documents for the City include the *Official Community Plan No. 9700* (OCP; City of Saskatoon 2020a), and the accompanying *Zoning Bylaw No. 8770* (City of Saskatoon, 2023a).

## ECOLOGICAL CONTEXT

Key highlights from the review of ecological data includes:

- The site consists of 86 ha of Open Canopy Mixed Woodland (65%), 33.5 ha of Tame Grassland (25.2%) and 9.9 ha of Wetland (7.4%) Land Cover. Small areas of Disturbed/Developed and Roads make up a combined 3.3 ha (2.4%) of the site
- Three flora SOMC are confirmed or have been historically observed on site. Additionally, two SOMC were identified to have a high likelihood of being on site but are unconfirmed (Section 3.5.2 – Flora Species of Management Concern)
- Five fauna SOMC are confirmed on site, and two SOMC have been identified as having a high likelihood of being detected but are unconfirmed. Northern leopard frog is also a species of conservation interest (Section 3.6.5 – Faunal Species of Management Concern)
- Culturally Significant species are considered (Section 3.5.3 – Flora Species of Interest to Indigenous Communities)
- Sixteen provincially designated noxious or nuisance weed species were documented to occur on site (Section 3.5.1 Noxious and Nuisance Weeds)
- Wildlife movement studies have not detected any obvious trends or patterns of wildlife movement. However, wildlife was observed to cross Township Road 362A and moving between the Class V wetland and the Chappell Marsh Conservation Area

## HUMAN CONTEXT

Key highlights from the review of past and present human uses includes:

- The site has a rich history, including being founded by Richard St. Barbe Baker as an afforestation area.
- The site is currently heavily used, and supports such activities as dog walking, hiking, and all-season biking.
- Existing infrastructure supports the existing uses, however it is in need of future upgrades.

## CONSERVATION PLAN

- Six Targets (forests, wetlands, recreation, education, cultural identity, and research) with 19 sub-targets total were identified for the site.
- Each Conservation Target received between two and seven Key Ecological Attributes (KEA) and corresponding Indicators to rank the health status of each (Section 5.2.1 – Conservation and Human Well-Being Targets; **Table 5-5**).
- A preliminary assessment rating the restoration feasibility for one forest site and one wetland site was completed. However, the required baseline data is incomplete meaning a restoration feasibility result could not be determined at this point. The framework was included to show the value of the tool for future applications.

- Direct Threats (both Conventional and Climate), Indirect Threats, and Opportunities were identified. Along with the Targets, these were compiled in a Situation Analysis to show the relationship between the various factors and pressures on the site.
- An Action Plan was developed to define the Goals, Strategies, Actions, and Objectives.
- Results Chains were developed to illustrate the theory of change on how each of the Strategies will impact a Direct Threat and help to achieve a goal.

## HUMAN USE

The following factors were considered to guide the development of future human use of the site:

- Programming of the site in terms of design for human use and balance of conservation.
- Management zones to guide the spatial programming of the site.
- A list of permitted and restricted uses was developed to support Human Well-Being Targets.
- Infrastructure to support permitted uses are highlighted and include such features as a circulation routes, gathering areas, and signage.
- Prohibited uses were identified to provide guidance on which uses of the site should not be permitted.
- Community Stewardship opportunities were identified to engage with the public.
- Safety of the site was considered using the City of Saskatoon’s Crime Prevention Through Environmental Design (CPTED) policies as a guide.

## LEGISLATIVE RECOMMENDATIONS

Future development proposals including concept plans shall consider and align with the information included in this and any associated planning reports and studies including but not limited to the Blairmore Sector Plan.

## IMPLEMENTATION

- Guidance for implementation of the Action Plan was developed to support the management of the site and the achievement of the Targets.
- A Monitoring Plan was developed to track the implementation of the Actions and Strategies, and monitor progress of the Objectives, and Goals.
- A template for an Operational Plan has been provided to track the responsibility and costs associated with implementation of the Strategies.



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# ACRONYMS

- **Aq:** Asquith
- **ATV:** All-Terrain Vehicle
- **BMX:** bicycle motocross
- **Br:** Bradwell
- **CMP:** Conservation Measures Partnership
- **CN:** Canadian National Railway Company
- **COSEWIC:** Committee on the Status of Endangered Wildlife In Canada
- **CPTED:** Crime Prevention Through Environmental Design
- **DUC:** Ducks Unlimited Canada
- **EDI:** Environmental Dynamics Inc
- **FSAA:** Friends of the Saskatoon Afforestation Areas
- **GHG:** Greenhouse Gas
- **K08:** Saskatoon Plain
- **KEA:** Key Ecological Attribute
- **MVA:** Meewasin Valley Authority
- **MVRMP:** Meewasin Valley-wide Resource Management Plan
- **Mw:** Meadow
- **NAI:** Natural Areas Inventory
- **NAMP:** Natural Area Management Plan
- **OCP:** Official Community Plan
- **PSA:** Project Study Area
- **RM:** Rural Municipality
- **ROW:** Right of Way
- **RSA:** Regional Study Area
- **RSBBA:** Richard St. Barbe Baker Afforestation Area
- **SKCDC:** Saskatchewan Conservation Data Centre
- **SOMC:** Species of Management Concern
- **VA:** Viability Assessment

# GLOSSARY

- **Afforestation:** The establishment of a forest or stand in areas where the preceding vegetation or land use was not forest.
- **Afforestation Areas:** Sites where a forest has been established where there was no previous tree cover.
- **Agricultural lands:** Land area that is either arable, under permanent crops, or under permanent pastures.
- **Biodiversity:** The richness and variety of living organisms and habitats within an ecosystem.
- **Catchments:** Area that are the surrounding landscapes of wetlands that drain into and contribute water to a specific wetland.
- **Class I Wetland:** ephemeral waterbody – Low lying land where water is present one to three weeks in early spring. Water drains quickly due to porous soils not long after the snowmelt. Plant communities are adapted to grow in moist soils (definition adapted from Stewart and Kantrud, 1971).
- **Class II Wetland:** temporary wetland – Low lying land that holds water between two to six weeks after the snowmelt, and a couple days after heavy rain. Plant communities are adapted to grow in moist soils (definition adapted from Stewart and Kantrud, 1971).
- **Class III Wetland:** seasonal wetland – Low lying land that holds surface water for extended periods in spring through mid-summer. Soils show hydric indicators including mottles. Plant communities are adapted to grow in flooded conditions (definition adapted from Stewart and Kantrud, 1971).
- **Class IV Wetland:** semi-permanent wetland – Low lying land that maintains surface water from April to September. Soils show hydric indicators including mottles and gleying. Plant communities are adapted to grow in deeper flooded conditions (definition adapted from Stewart and Kantrud, 1971).
- **Class V Wetland:** Permanent wetland – Low lying area that maintains water surface in most years. Soils show hydric indicators including mottles and gleying. Plant communities are adapted to grow in deeper flooded conditions, with the center being unvegetated and comprised of only water (definition adapted from Stewart and Kantrud, 1971).
- **Conservation:** The sustainable use, protection, and management of natural areas and assets to prevent decline or loss.
- **Corridor:** A band of vegetation, usually older forest, that serves to connect distinct patches on the landscape.
- **Disturbed lands:** Land or region where the natural environment has been altered, disrupted, or damaged by human activities. Examples are logging, mining, agriculture, construction, or other processes that disrupt the original ecological balance.
- **Ecodistrict:** A part of an ecoregion characterized by distinctive assemblages of relief, geology, landforms and soils, vegetation, water, fauna, and land use.
- **Ecological features:** A specific component of an ecosystem that plays a distinct role in the environment. Examples are organisms, habitat, or waterbodies.
- **Ecological processes:** Actions or events that shape ecosystems such as disturbances, predation, competition, nutrient and element cycling such as carbon sequestration.
- **Ecology:** The scientific study of interactions between living organisms and their environment.
- **Ecological systems:** A biological community consisting of all the living organisms (including humans) in a particular area and the nonliving components, such as air, water, and mineral soil, with which the organisms interact. It is also referred to as an ecosystem.
- **Ecoregions:** A subdivision of an ecozone, normally mapped at 1:250000 scale and characterized by distinctive large order landforms or assemblages of regional landforms as expressed by vegetation, soils, water, and sometimes human activity.
- **Ecosystem services:** The array of benefits provided by green infrastructure.
- **Ecozone:** A large area (i.e., usually mapped at 1:1000000 scale) that represents broad features of relatively uniform climate, geology, soils, landforms, vegetation and human activity.
- **Fauna:** A general term for all forms of animal life characteristic of a region, period or special environment.
- **Flora:** A general term for all forms of plant life characteristic of a region, period or special environment.

- **Forage:** Grasses, herbs, and small shrubs that can be used as feed for livestock or wildlife.
- **Forests:** A complex community of plants and animals in which trees are the most conspicuous members and where the tree crown density is greater than 10 percent.
- **Fragmentation:** The process whereby large habitats or natural areas are broken into smaller patches and isolated from each other, often as a result of development and land use change.
- **Functional connectivity:** The degree to which a landscape promotes or interferes with the movement of wildlife and vegetation between habitats.
- **Grasslands:** Ecosystems dominated by native grasses and forbs, and which may contain some shrub and tree communities.
- **Green infrastructure:** A system of natural, enhanced, and engineered assets that provide municipal and ecosystem services by protecting, restoring, or emulating nature.
- **Green Network:** When green infrastructure is designed holistically, it becomes an interconnected Green Network that enhances the urban environment and improves quality of life.
- **Green spaces:** A land that is partly or completely covered with trees, shrubs, grass, or other vegetation. This includes urban parks, trails and community farms or gardens including roof top gardens.
- **Habitat:** The natural environment in which an organism normally lives.
- **Habitat restoration:** The process of restoring the functional aspects of a given ecosystem to a semblance of its pre-disturbed state.
- **Heritage features:** Element, site, structure, object, or aspect of cultural, historical, or natural significance that is considered valuable and worth preserving due to its importance to a particular community, region, or society. Examples are historic buildings, archaeological sites, cultural traditions, or other assets that contribute to the understanding and appreciation of a shared heritage or identity.
- **Hydrology:** Science that deals with the waters above and below the land surfaces of the earth, their occurrence, circulation, and distribution, both in time and space, their biological, chemical, and physical properties, their reaction with their environment, including their relation to living beings.
- **Indicator:** A measurable entity that is used to assess the status and the trend of a Key Ecological Attribute (e.g., hectare, population size) (definition adapted from The Nature Conservancy, n.d.).
- **Indicator rating:** The ranges of variation in an indicator that define and distinguish very good, good, fair, and poor rating categories to provide a consistent and objective basis for assessing the status of the indicator (definition adapted from The Nature Conservancy, n.d.).
- **Indigenous Peoples:** A collective name for the original peoples of Canada. There are three distinct groups: First Nations, Métis, and Inuit.
- **Inter-connectivity:** The connectedness of two or more defined areas.
- **Intra-connectivity:** The connectedness of one defined area.
- **Invasive Species:** A species that is non-native to an ecosystem and whose presence causes or is likely to cause harm to economic, environmental, or human health.
- **Key Ecological Attribute (KEA):** A structure, composition, interaction, or biotic and abiotic processes that enable the target to persist through influence on the target's size, condition, and landscape context. It is fundamental component of the target's life history, habitat, community interaction, or physical processes (e.g., number of species of management concern, extent of invasive species).
- **Land Cover:** Refers to the surface cover on the ground, whether vegetation, urban infrastructure, water, bare soil or other.
- **Landscape:** An expanse of natural or human-made scenery, comprising landforms, made features that, taken together, form a composite.
- **Landscape connectivity:** The degree to which the landscape facilitates or impedes movement among resource patches.
- **Mixed Woodland:** Forest that is comprised of coniferous and deciduous trees.
- **NAMP Team:** Group of technical experts which contributed to the development of the NAMP.
- **Native forests:** Forest consisting entirely of Indigenous/native trees and plants.

- **Native grasslands:** A landscape unit where the vegetation is dominated by grasses, grass like plants, and/or forbs (>50 per cent).
- **Native species:** Species that occurs naturally in an area.
- **Native vegetation:** The assemblage of native plants in a specific place or region that have adapted to environmental (e.g., edaphic) and biological (e.g., presence of other plants) conditions. Plants or plant populations that have developed in and are adapted to a particular climatic or soil zone.
- **Natural areas:** An area containing natural assets that work together to provide ecosystem services (e.g., habitats, nutrient cycling, water purification, climate regulation, carbon sequestration) and social benefits (e.g., recreational, aesthetic, cultural).
- **Natural assets:** Ecological resources that are native to the Saskatoon region including the South Saskatchewan River, grasslands, woodlands, wetlands, and soil systems. These sites often contain important cultural and archaeological features.
- **Natural feature:** A distinct and prominent aspect of the natural environment, such as a geographical landmark, landform, or body of water.
- **Natural parks:** Area of environmental, historical, cultural, recreational, and aesthetic values. Ecosystems and natural features can be used for education of ecological and environmental awareness as well as recreational purposes.
- **Natural resource:** Land, vegetation, wildlife, and water (surface and groundwater) that have value and importance in the environmental life cycle and contribute to the quality of life.
- **Non-native species:** Introduced species in an area.
- **Noxious Weed:** Any plant that is designated by order of the minister as a noxious weed and includes the seeds or any other part of that plant that may grow to produce another plant (from *Weed Control Act (2010)*).
- **Nuisance Weed:** Any plant that is designated by order of the minister as a nuisance weed and includes the seeds or any other part of that plant that may grow to produce another plant (from *Weed Control Act (2010)*).
- **Physical Connectivity:** The physical distance between landscape elements.
- **Prairie:** Prairies are enormous stretches of flat grassland with moderate temperatures, moderate rainfall, and few trees. Prairies are usually interspersed by low-lying wetland ecosystems.
- **Prohibited Weed:** Any plant that is designated by order of the minister as a prohibited weed and includes the seeds or any other part of that plant that may grow to produce another plant (from *Weed Control Act (2010)*).
- **Reference ecosystem:** A community of species that can act as a model for restoration. The attributes and successional phase of the reference ecosystem is to be similar to the restoration project site (definition adapted from The Nature Conservancy, n.d.).
- **Recreation area:** Land that is designed, constructed, designated, or used for recreational activities.
- **Shrublands:** A vegetation that is dominated by shrubs or short statured trees, generally < 5 m tall, often in a single canopy layer.
- **Site:** anything within the property lines as provided by the City of Saskatoon.
- **Species composition:** The number of different species present in an ecosystem, as well as the relative abundance of each of those species.
- **Swale complex:** A network of interconnected swales, which are shallow vegetated depressions or channels that manage water drainage and erosion. Swales play a crucial role in ecosystem functioning by serving as habitat, supporting biodiversity, and contributing to water filtration and retention. RSBBA is part of the West Swale Complex.
- **Tame Grassland:** Developed areas that have the intention of replacing native vegetation and introducing non-native (tame) forage species such as smooth brome or alfalfa.
- **Trail system:** Trail system may consist of trails for hiking, biking, interpretation, administration, or a combination thereof. It also includes trail amenities such as signs (informative, interpretive, or regulatory), parking, benches, picnic tables, and viewing platforms.
- **Undesirable Species:** species not designated under the Saskatchewan weed control act (reed canary grass [*Phalaris arundinacea*], Kentucky bluegrass [*Poa pratensis*]).
- **Vegetation:** Ground cover provided by plants.



- **Waterbody:** Term used to describe a significant body of water, such as a river, lake, ocean, wetland or any other distinct water feature.
- **Wetland:** Land having water at, near, or above the land surface; land saturated with water long enough to promote aquatic processes as indicated by saturated or hydric soils, aquatic vegetation, and various kinds of biological activity adapted to a wet environment.
- **Wetland complex:** A combination of individual wetlands and surrounding riparian areas that have complementary functions and greater significance when viewed together rather than individually.

# LAND ACKNOWLEDGEMENT

We acknowledge that Richard St Barbe Baker Afforestation Area is located on Treaty 6 Territory and the Traditional Homeland of the Métis. Indigenous people of primarily Cree, Dakota and Saulteaux descent have called the land now known as Saskatoon home for thousands of years. Today, this place is home to Indigenous people from a diversity of cultures and language groups. The City of Saskatoon (City) recognizes the distinct order of government of First Nations and Métis and is committed to maintaining strong relationships through meaningful dialogue with Indigenous communities and organizations. Strengthening cooperation and mutual support by working in partnership with Indigenous communities toward respective community goals and objectives is vital to fostering more inclusive communities.

# 1 INTRODUCTION

To assist with the management and protection of the Richard St. Barbe Baker Afforestation Area (RSBBAA; the site), a Natural Area Management Plan (NAMP; the project) was developed by the City of Saskatoon (the City) and WSP Canada Inc. (WSP), with the input of various stakeholders. Collectively the contributors are referred to as the NAMP team, a group of technical experts.

RSBBAA has been identified as an important site which has the potential to provide high ecosystem services. Prior to the development of the NAMP, a formal level of service had not been established for the site, which left RSBBAA open to the risk of degradation and incompatible land uses. As such, the City determined to develop a NAMP as a means of proactively managing the use and protection of this natural feature, which will become increasingly important as Saskatoon continues to grow. This work is part of the City’s “Pathways for an Integrated Green Network: An Implementation Plan for Saskatoon’s Green Infrastructure Strategy” (Green Pathways; City of Saskatoon, 2022a). Through Green Pathways, the City is developing a Natural Areas Program, which works to protect, restore, and manage natural areas in Saskatoon’s green network.

This NAMP respects the work previously completed by the Meewasin Valley Authority (MVA) in the Meewasin Valley-wide Resource Management Plan (MVRMP; MVA, 2017), and should be considered a site-specific application of Meewasin’s recommendations.



**Figure 11-1: Wetlands of RSBBAA**

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## 1.1 SCOPE

### 1.1.1 PROJECT SITE

The site is the area known as the RSBBA (see **Appendix A: Figure 1**). The site is composed of a mix of modified and native forests, a wetland complex, a well-used trail system, a skills bike park, and an off-leash dog park. Three easement holders are present where the RSBBA is situated and include Canadian National Rail (CN), TransGas, and SaskPower. The RSBBA covers an area approximately 133 ha in size.

The site occurs within the Saskatoon Plain (K08) Ecodistrict of the Moist Mixed Grassland Ecoregion within the Prairie Ecozone (Action et al., 1998). The Moist Mixed Grassland is considered a subhumid climate, which receives approximately 383 mm of precipitation annually, with 240 mm of that precipitation occurring during the growing season (May through September). The annual average temperature is 2.4°C (Acton et al., 1998). The RSBBA has an array of wildlife and vegetation species, including some species of management concern.

The RSBBA was designated an afforestation area in 1972, in honour of Richard St. Barbe Baker, an internationally known forestry advisor and conservationist, who advocated for tree planting and reforestation efforts around the world. It is currently a popular destination for visitors to enjoy one of the few forested areas in Saskatoon.

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### 1.1.2 NAMP SCOPE

The scope of the NAMP (the Project) is to outline the steps to protect, restore, and manage the RSBBA to conserve its ecological and heritage features and provide a connection to nature for current and future generations. It aims to provide guidance for a formal level of service and provides recommendations for future land use and management. The NAMP includes a vision for the RSBBA, a baseline summary of the existing conditions, a conservation plan, and an implementation plan.

#### *NAMP NEED & PAST INITIATIVES*

Through past and current initiatives, the RSBBA has been the subject of several studies and reports including a Natural Area Screening Report (Golder, 2012), the Montgomery Place Local Area Plan (City of Saskatoon, 2018), and the Blairmore Natural Areas Screening Report (EDI, 2022). Community groups such as the Friends of the Saskatoon Afforestation Areas (FSAA) are actively contributing to conservation management of the RSBBA to protect the ecological and cultural significance of the area. Still, through the development of the City and the variety of recreational uses in the project site, the RSBBA is at threat of isolation from the surrounding natural matrix and faces continuous decline in biodiversity and general condition based on historical land current uses. If left unguided, proposed developments in proximity to the site may contribute to additional fragmentation and deterioration of ecosystem health.

The creation of the NAMP will guide the City in sustaining the site. The NAMP will identify areas of sensitivity, knowledge gaps, and conservation targets. Carefully laid out terms and recommendations, including monitoring guidance and long-term planning will allow the City to manage the site successfully. The proposed monitoring strategies and long-term guides clearly articulate the management strategies and activities for inventory, restoration, monitoring, and research activities for the future.

The NAMP is intended to be a dynamic document, and should be added to as new threats, targets shift, or new concerns are identified. This iteration has a ten-year lifecycle, determined by the Open Standards for the Practice of Conservation (2020) as a reasonable timeline to accomplish or revise NAMP objectives.

### 1.1.3 METHODS

A detailed review of available studies, literature, and assessments relevant to the site was completed to provide the foundational understanding of the biophysical condition of the site. A desktop review was completed to verify and update any existing information found through the literature review, and site visits were conducted confirm any knowledge gaps, as well as to verify findings and record incidental observations.

Engagement with key stakeholders, organizations, and residents throughout the process informed both the understanding of the site, and the recommendations subsequently put forth. Engagement occurred at strategic points throughout the project, including workshops, open houses, and formal conversations.

The Open Standards for the Practice of Conservation (CMP, 2020) was utilized to guide the development of the NAMP (Figure 1-2). The Conservation Standards provided a transparent basis for shared decision-making and collaboration (CMP, 2020). This evidence-based framework was instrumental in the analysis of the existing information, and the development of key recommendations, such as the vision, targets, and action plan.



Figure 11-2: Conservation Standards (CMP, 2020)

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### 1.1.4 DATA SOURCES

Key reports that were reviewed for the NAMP included:

- Blairmore Natural Areas Screening Final Report (EDI Environmental Dynamics, 2022)
- Montgomery Place Local Area Plan Final Report (City of Saskatoon, 2018)
- Meewasin Valley-wide Resource Management Plan (MVA, 2017)
- Natural Areas Inventory for the City of Saskatoon, 2019 (MVA, 2019)
- Natural Asset Inventory Dashboard, 2021 (Green Analytics, 2021)

Other relevant databases and websites reviewed included:

- The Ecoregions of Saskatchewan (Acton, et al., 1998)
- Saskatchewan Soil Information System (SKSIS) (SKSIS Working Group, 2018)
- Classification of Natural Ponds and Lakes in the Glaciated Prairie Region (Stewart and Kantrud, 1971)
- Saskatchewan Conservation Data Centre (SKCDC) tracked species lists.
- Species at Risk (SAR) public registry (Government of Canada, 2022)
- iMapInvasives (NatureServe, 2022)

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## 1.2 PROJECT LOCATION & LOCAL CONTEXT

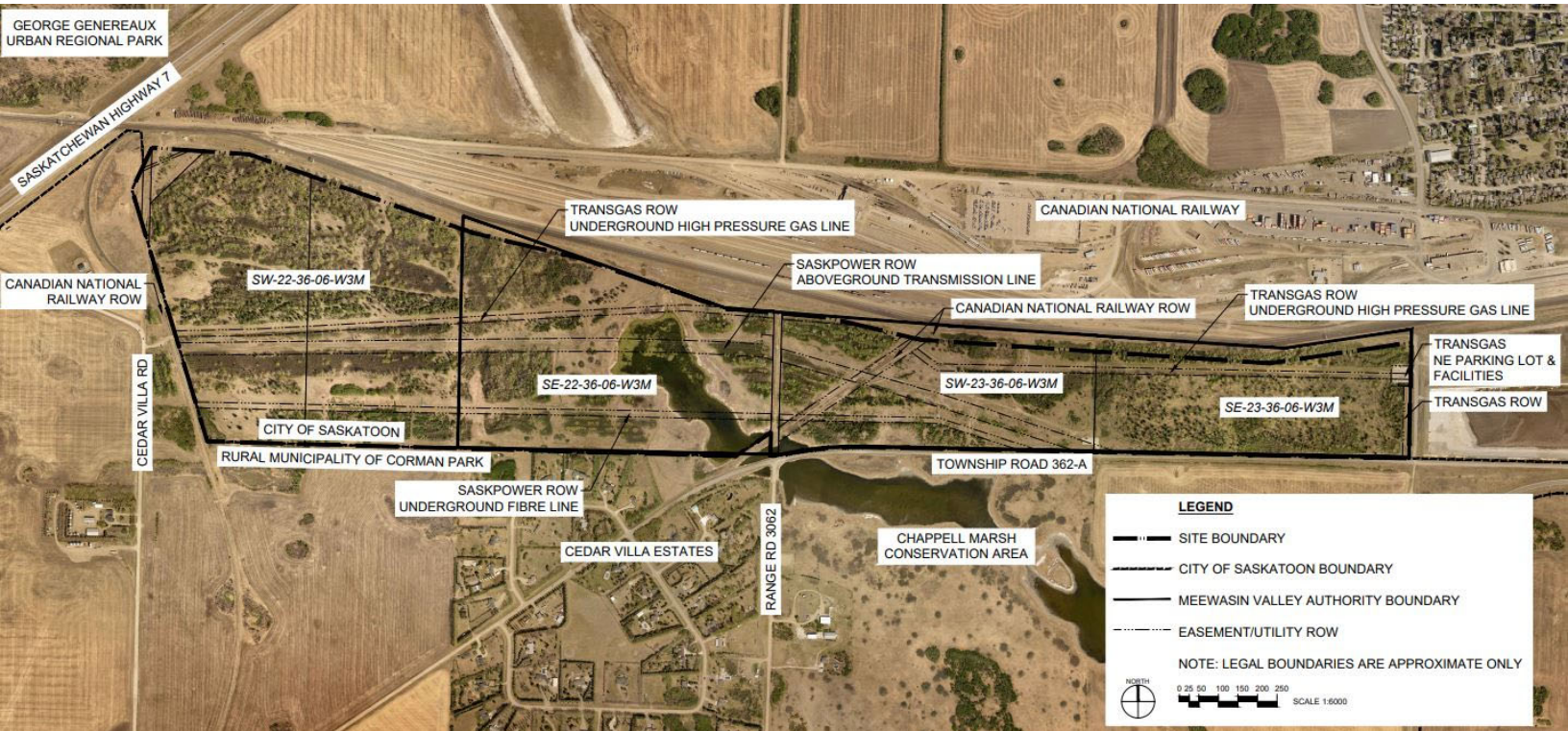
The Richard St. Barbe Baker Afforestation Area (RSBBAA) is located within the Blairmore Sector area in the southwestern portion of Saskatoon (**Figure 11-3**). The site spans portions of the following quarter sections:

- SW-22-36-06-W3M
- SE-22-36-06-W3M
- SW-23-36-06-W3M
- SE-23-36-06-W3M

The RSBBAA is bordered by Range Rd 3063 to the west, and Township Road 362-A to the south. It is situated between Highway 7 to the west and Circle Drive to the east.

The site is surrounded by a mix of housing developments, agricultural lands, natural parks, and privately owned lands. The closest residential neighbourhoods are those of Cedar Villa Estates to the south, and Montgomery Place to the northeast. The Blairmore Development Area and Southwest Development Area are located to the north of the site. Private lands include those of the Canadian National Railway (CN) Yard, which completely borders the northern site, the Saskatoon Civic Operations Center, including the snow dump facility, to the east of the site, and various private residential and agricultural lands.

The closest natural areas are those of Chappell Marsh Conservation Area to the south, and George Genereux Urban Regional Park to the northwest. Connections to these natural areas are not currently formalized or are nonexistent.



**Figure 11-3: Project Location & Site Ownership**

### 1.2.1 OWNERSHIP

The City of Saskatoon owns the entirety of site, with the eastern portion of the site falling under the jurisdiction of the Meewasin Valley Authority. Three easement holders are present and include the following:

- CN Rail holds a Right-of-Way/easement along the on exterior of the northern and western boundaries of the site (Figure 11-3). The tracks are active and trains have been noted to stop along the western tracks, creating a challenge to those accessing the site from the western parking lot located on the opposite side of the tracks to the site. Work within the CN easement will be subject to CN’s Proximity Guidelines. CN has recommended that in future, a secure chain link fence of a minimum of 1.83 m in height be established along the CN ROW, as more users are expected to access the site in future. Currently, a chain link fence traverses the northern boundary of the Southwest Off Leash Recreation Area (SWOLRA). Further discussion with CN is needed to determine the need for additional fencing
- SaskPower holds a 33m wide easement for three transmission lines, and a 15m wide easement for a buried fibre line (Figure 11-3). SaskPower has advised that any work which may impact the easements (e.g., fencing, gates, plantings, trail development) requires prior written consent before installation. SaskPower’s guidelines for “Understanding Power Line Right-of-Ways” should be consulted prior to work that may impact the easement
- TransGas/SaskEnergy owns the parking lot in the northeast corner of the RSBBA, and holds easements for several high-pressure gas lines throughout the site, including one 12 inch, and two 16 inch high pressure gas lines. The parking lot in the northeast corner of the RSBBA also contains TransGas infrastructure. Any work or ground disturbance within 30m of a high-pressure gas line requires a Facility Crossing Permit prior to construction. Any work or ground disturbance within 10 m of an easement requires an approved permit and record of locate from Sask1stCall prior to work occurring

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## 1.3 VISION

Rustling leaves and sparkling wetlands, a refuge for wildlife and visitors and an enduring place for those who speak for the trees.



Figure 11-4: Vision for RSBBA - Blending nature and recreation.



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## 1.4 STRATEGIC DRIVERS

The creation of the NAMP was informed by the guiding bylaws, policies, and strategies described below.

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### 1.4.1 OFFICIAL COMMUNITY PLAN BYLAW, 2020

The City's role in natural areas stewardship is broadly defined in the Official Community Plan (OCP, City of Saskatoon, 2020a), which includes the following policy statements to support the retention of natural areas.

#### 1.4.1.1 ENVIRONMENTAL STEWARDSHIP

##### (2) Policies

(c) Provide support for demonstrations, pilot projects, and innovations to develop a local culture of improved environmental protection.

#### 1.4.1.2 INTEGRATION WITH URBAN ENVIRONMENT

##### (2) Policies

(a) Facilitate the creation of a connected green network to support ecological systems and increase equitable access to green spaces and the larger green network.

(b) Urban development should avoid impacts to Natural Areas with particular consideration given to interconnected sensitive ecosystems, such as swales.

#### 1.4.1.3 NATURAL ASSET MANAGEMENT

##### (2) Policies

(a) Implement and maintain an asset management policy to manage built and natural assets in Saskatoon.

(b) Develop and maintain a system of natural capital asset valuation to aid in determining appropriate levels of service or condition for natural assets and how they are budgeted for.

(c) Support actions that further the use of green infrastructure to enhance the adaptive capacity of the City in response to climate change.

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### 1.4.2 2022-2025 STRATEGIC PLAN

The City of Saskatoon 2022-2025 Strategic Plan (City of Saskatoon, 2022b) includes an action to “Implement actions in the Green Infrastructure Strategy and Implementation Plan within proposed timeframes”.

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### 1.4.3 ASSET MANAGEMENT POLICY

Strategic direction for the City's asset management approach is provided through the Asset Management Policy (City of Saskatoon, 2020b), which was updated in 2020 to include natural assets.

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#### 1.4.4 GREEN INFRASTRUCTURE STRATEGY (2020)

The Green Infrastructure Strategy (City of Saskatoon, 2020c) is the guiding document for this work and takes a nature-based approach to city planning to ensure Saskatoon is a connected and nature-friendly city that all residents can access. The Strategy outlines a vision for Saskatoon's Green Network and will guide the City's work through fifteen actions that address risks to the network.

The following actions are particularly relevant:

- Action 11: Protect, restore, and manage significant natural areas
- Action 13: Improve biodiversity and ecosystem health throughout the Green Network

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#### 1.4.5 PATHWAYS FOR AN INTEGRATED GREEN NETWORK (2022)

This project is part of the implementation of *Pathways for an Integrated Green Network* (Green Pathways; City of Saskatoon, 2022a), and aligns with the following initiatives and phases:

- Action 1.2.1: Natural Area Management Plans
- **(2a) Natural areas inventory and evaluation:** Prioritize natural areas for integration into the green network using data from existing inventories and risk assessments
- **(2b) Template development:** Develop a template for Natural Area Management Plans that includes management, restoration, monitoring, and asset management considerations. Consider concurrent work at the City such as preparation of Natural Area Policy, Tree Protection Bylaw, Traditional Land Use and Knowledge Assessment, and Integrated Pest Management Strategy that may inform content of the template
- **(2c) Pilots:** Prepare Natural Area Management Plans for prioritized sites
- **(2d) Program recommendations:** Incorporating best practices from the previous phases, prepare recommendations for the ongoing program to implement existing NAMPs and prepare additional ones. Identify funding needs for the implementation and ongoing delivery of the NAMPs
- Action 1.4.1: Natural Asset Framework
- **(2d) Management plan integration:** Integrate asset management principles into Natural Area Management Plan (Initiative 1.2.1) or developing recommendations for further corporate asset integration (Initiative 3.1.3)
- Climate Action Plans

Saskatoon's *Low Emissions Community Plan* (City of Saskatoon, 2019a) highlights the important role of natural assets in capturing and storing carbon, including in wetlands, grasslands, and forests/shrublands. The City's *Adaptation Strategy* (City of Saskatoon, 2019b) includes support for the integration of green infrastructure into all available aspects of urban development with two relevant actions: retain soil moisture and to select species for resiliency.

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#### 1.4.6 WETLAND POLICY (2013)

The City adopted the Wetland Policy in 2013 (City of Saskatoon, 2013). The policy provides direction for the City to maintain an inventory of wetlands and requires that wetland mitigation plans be developed during the concept plan process. It also establishes requirements to avoid, minimize, and restore or compensate for wetlands considered to be higher value.

**1.4.7 BLAIRMORE NATURAL AREA SCREENING**

The City of Saskatoon Blairmore Natural Areas Screening Final Report describes the habitat features at RSBBA, and includes the following recommendations:

*That the City focus conservation and enhancement planning on two important natural assets within the Study Area: West Swale and associated wetland complexes; and the Afforestation Areas.*

**1.4.8 MONTGOMERY PLACE LOCAL AREA PLAN**

At its regular business meeting on November 19, 2018, City Council adopted the Montgomery Place Local Area Plan (City of Saskatoon, 2018), which was the result of input from more than 200 neighbourhood residents and stakeholders. During that engagement, residents of Montgomery Place identified RSBBA as a valuable natural resource that residents feel is part of the neighbourhood and take pride in, despite it being outside the official neighbourhood boundaries.

**1.5 RIGHTSHOLDERS, LAND MANAGERS, PARTNERS, AND STAKEHOLDERS**

The NAMP represents a collaboration between the City of Saskatoon, the NAMP team, and certain stakeholders. Stakeholders were identified by the City of Saskatoon, some of which were engaged to provide initial feedback on the NAMP. A list of the rightsholders and stakeholders is provided in the table below, including their interest in the NAMP, and those who were engaged during the development of the NAMP.

**Table 1-1 Rightsholders and Stakeholders**

RIGHTSHOLDERS	INTEREST IN MANAGEMENT PLAN	ENGAGEMENT OF RIGHTSHOLDER/STAKEHOLDER
Indigenous Communities	Education, partnerships, harvesting opportunities, land dedications, ceremonial spaces, culturally significant plant and wildlife species recommendations.	To be engaged in future in coordination with related City projects.
STAKEHOLDER	INTEREST IN MANAGEMENT PLAN	
City of Saskatoon (including Sustainability, Planning and Development, Parks, Recreation and Community Development, Saskatoon Water)	Management, maintenance, funding, planning, enforcement, and integration of the site into the larger City plans.	Engaged and provided feedback on the NAMP.
Meewasin	Management, maintenance, funding, planning, enforcement, and integration of the site into the larger Meewasin plans.	Engaged and provided feedback on the NAMP.
Developers, Private Landowners & Businesses	Implications to restricted land use or infrastructure near the site.	Residents of Cedar Villa Estates engaged.
Friends of the Saskatoon Afforestation Areas	As stewards of the RSBBA, the Friends of the Afforestation, the management plan has direct implications in how the site will be managed in the future.	Engaged and provided feedback on the NAMP.
Fatlanders Fat Tire Brigade	Interest in potential maintenance, liability, and trail use.	Engaged and provided feedback on the NAMP.

RIGHTSHOLDERS	INTEREST IN MANAGEMENT PLAN	ENGAGEMENT OF RIGHTSHOLDER/STAKEHOLDER
Cedar Villa Skills BMX Users	Use of site for skills park users, maintenance, liability, and restrictions.	Engaged.
Dog Walkers	Use of the site.	Specific group not engaged.

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### 1.5.1 STEWARDSHIP ORGANIZATIONS AND USER AGREEMENTS

As the Blairmore Sector Plan is being developed, no long-term user agreements have been formalized. In the absence of formalized management, some short-term uses have been approved through temporary user agreements with community groups including the Saskatoon Friends of the Afforestation Areas, Cedar Villa Bicycle Trails, and Flatlander Fat Tire Brigade. In 2013, the first formal recreation area was established within RSBBA with the creation of the Southwest Off-Leash Recreation Area, which is managed through the City’s Animal Services.

# 2 LEGISLATIVE CONTEXT

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## 2.1 POLICY AND GOVERNANCE CONTEXT

The RSBBA is located in and is subject to the policies and regulations of the City of Saskatoon (City). The highest-order planning documents for the City include the Official Community Plan No. 9700 (OCP; City of Saskatoon 2020a), and the accompanying Zoning Bylaw No. 8770 (City of Saskatoon, 2023a). Relevant policies from the OCP and other applicable standards are identified in section 1.5 -Strategic Drivers.

The site is located in the Meewasin's 'Conservation Zone'. Approval is required from the Authority on any improvement valued over \$25,000 in accordance with the Meewasin Valley Authority Act (Government of Saskatchewan, 1979).

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### 2.1.1 LAND USE DESIGNATION

Land use designations are a key implementation tool of the City's Official Community Plan (City of Saskatoon, 2020a). They establish the general use and character of a site or area to help ensure that development takes place in an orderly, rational manner. Land use designations may reaffirm existing development patterns or guide how an area's character and uses may change in the future.

The western half of the site, opposite the off-leash dog park, is identified as 'Urban Holding'. The remainder of the site is identified as 'Special Use Area'. These land uses will be refined at the time that a concept plan for the area is approved by Council. Definitions for the existing land use designations are as follows:

- 'Special Use Areas' may include a diverse range of uses such as, airports, cemeteries, railyards, significant open spaces, and major educational, institutional, government, recreational, ecological, cultural, and public facilities, and utility installations
  - 'Urban Holding' is used when the future land use and/or the timing of greenfield development are yet to be established, and where existing uses may continue, and interim uses may be established
- 

### 2.1.2 ZONING

Land within the City of Saskatoon is divided into zoning districts which determine how land may be developed. Each zoning district includes rules for the location and size of buildings, required parking, minimum landscaping requirements and other regulations.

This site is currently zoned AG-Agricultural District (AG District). The purpose of the district is to provide for certain large-scale specialized land uses as well as certain rural-oriented uses on the periphery of the City. The AG District is commonly used as an interim zoning district until more information about the future urban development for that area is known. The City does not have districts for parks and recreation areas, instead, these uses are permitted within various districts including the AG-Agricultural District. Following the approval of a concept plan for this area, appropriate zoning districts will be applied through the rezoning process.

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### 2.1.3 ASSOCIATED PLANNING PROCESSES

Development in the City of Saskatoon is regulated by an established process that includes a hierarchy of plans including sector and concept plans to refine the vision for development of an area.

Sector Plans provide a broad framework for future urban development and include the location and size of future neighbourhoods, employment areas, parks, and significant natural areas. A Sector typically contains 6 – 10 subsequent concept plans which provide greater detail for the area.

The site is located within the Blairmore Sector Plan (City of Saskatoon, 2010). The Sector Plan includes several key recommendations related to the RSBBA. These recommendations are included in the section titled ‘strategic drivers (Section 1.5)’.

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#### *2.1.4 POTENTIAL FUTURE ADJACENT DEVELOPMENT*

The site is adjacent to the municipal boundary between the City of Saskatoon and the RM of Corman Park. The area outside of the City boundary is regulated by the RM of Corman Park and is known as the P4G Planning District (City of Saskatoon et. al, 2023a). Land located in the district is subject to the policies and regulations identified in the P4G District Official Community Plan (City of Saskatoon et. al, 2023a) and accompanying Zoning Bylaw (City of Saskatoon et. al, 2023b).

The District Land Use map forming part of the District Official Community Plan (City of Saskatoon et. al, 2023a) is used to establish the general use and character of an area or reaffirm existing land uses. There is an existing country residential development south of RSBBA located in the RM. The District Land Use Map suggests that the area around this site could also be developed to accommodate additional country residential development. Additional development in this area could result in an increased demand for services within RSBBA. Development would be subject to internal and external consultation and has no immediate implications on this management plan.

## 3 ECOLOGICAL CONTEXT

To inform appropriate management goals and objectives, WSP completed a baseline summary of RSBBA (see **Appendix B**). The baseline summary included a review of relevant desktop information assessed at three spatial extents:

- 1 Project Study Area (the site): encompasses the extent of the RSBBA.
- 2 Local Study Area (LSA): includes the site plus a 1 km buffer to encompass the minimum setback distances for Sensitive Species (Ministry of Environment, 2017) and Species of Management Concern (SOMC).
- 3 Regional Study Area (RSA): includes the site plus a 5 km buffer to capture SOMC with larger home ranges.

A subsequent site visit was conducted to fill existing knowledge gaps to better inform any additional baseline data collection and the Conservation Plan.

The following section summarize the ecological context of RSBBA. Refer to Appendix B for the complete environmental baseline summary.

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### 3.1 GENERAL ENVIRONMENTAL SETTING

The site occurs within the Saskatoon Plain (K08) Ecodistrict of the Moist Mixed Grassland Ecoregion within the Prairie Ecozone (Acton et al., 1998). The Moist Mixed Grassland is considered a subhumid climate, less arid than its neighbouring Mixed Grassland Ecoregion to the south but warmer and drier than the Aspen Parkland Ecoregion to the north. On average, this ecoregion receives approximately 383 mm of precipitation annually, with 240 mm of that precipitation occurring during the growing season (May through September). The annual average temperature is 2.4°C (Acton et al., 1998).

The landscape of the Moist Mixed Grassland is dotted with undrained depressions due to the land formation by glacial till. The dominant tree species in the Moist Mixed Grassland is trembling aspen (*Populus tremuloides*), which is commonly found in groves surrounding the various depression wetlands (Acton, et al., 1998).

The site resides within the CN Railway Rail Yards Management site, which is comprised of 57.2 ha of grasslands, 86.6 ha of forest/shrubland and 11.5 ha of wetlands. According to Green Analytics (2021), much of this area was confirmed to be in fair condition based on four condition categories: Surface Permeability, Adjacent Land Use, Road Density, and Relative Asset Size.

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### 3.2 ASSET INVENTORY AND ECOLOGICAL SERVICES

#### 3.2.1 NATURAL ASSETS

The site comprises 86.0 ha of Open Canopy Mixed Woodland (65%), 33.5 ha of Tame Grassland (25.2%) and 9.9 ha of Wetland (7.4%) Land Cover. Small areas of Disturbed/Developed and Roads make up a combined 3.3 ha (2.4%) of the site (**Table 3-1, Appendix A; Figure 2**).

Land cover Categories, Subcategories and Secondary Subcategories were classified using the Natural Areas Inventory (NAI) for the City of Saskatoon prepared by Meewasin (2019).

**Table 3-1: Land Cover Types Present in the Site.**

CATEGORY <sup>(a)</sup>	HABITAT TYPE <sup>(b)</sup>	SUBCATEGORY	SECONDARY SUBCATEGORY	SITE (HA)	PERCENTAGE
Natural Assets	Tame Grassland	Grassland Systems	Naturalized	33.5	25.3
	Open Canopy Mixed Woodland	Forested and Shrubland Systems	Afforested	86.0	65.0
	Wetland	Aquatic Systems	Wetland	9.9	7.4
n/a	Disturbed/Developed	n/a	n/a	3.1	2.2
	Road	n/a	n/a	0.2	0.2
Total				132.7	100

**Notes:**

a) N/A denotes habitat types not categorized in the Meewasin 2019 Natural Areas Inventory for the City of Saskatoon.

b) "Habitat type" was not utilized in the Natural Areas Inventory.

### 3.2.2 ECOSYSTEM SERVICES

Ecosystem services are the benefits that nature provides. Understanding the specific ecosystem services that the site provides will inform the targets and management objectives for the NAMP. An initial assessment of the ecosystem services provided by RSBBA was completed through the Natural Capital Asset Valuation (NCAV) Study (City of Saskatoon, 2020d). The NCAV study identified that RSBBA is conservatively estimated to provide \$347,600/ha/year in ecosystem services, some of which are summarized below.

**Table 3-2: Ecosystem Services of RSBBA**

ECOSYSTEM SERVICE CATEGORY	SERVICE DESCRIPTION
Supporting Services	Habitat provision: a diversity of vegetation and wildlife area present at RSBBA, including species at risk.
Regulating Services	Carbon sequestration and storage in wetlands, grasslands, and forest. Flood control: wetlands absorb surface water after extreme weather events. Waste-water treatment: wetlands can filter animal waste, certain chemicals, and pollutants. Air quality: Vegetation such as trees supports the removal of pollutants from the atmosphere.
Cultural Services	RSBBA provides green space for physical exercise, bird or animal watching, and relaxation, which have physical and mental health benefits. RSBBA provides research and educational opportunities, such as bird banding and bat monitoring programs. RSBBA provides ground to harvest medicinal and edible plants



## 3.3 TOPOGRAPHY AND SOILS

### 3.3.1 TOPOGRAPHY

The site is relatively flat with minor topography changes throughout, with the lowest lying areas being the locations of wetlands. Previous cultivation, and possibly afforestation, efforts may have resulted in changes to the topography because of grading or landscape alterations.

### 3.3.2 SOILS

According to document and data review, four different soil associations and six soil map units were identified within the site (**Appendix A; Figure 3**). EDI (2022) observed that the site was predominately covered by the Bradwell (Br) soil associations, with smaller portions covered by Asquith (Aq) and Meadow (Mw). All three of these soil associations come with limitations. The Bradwell (Br) soil association depicts insufficient soil water-holding capacity due to textural properties. Because of this, the soil restricts the range of crops and may require special conservation practices. The same is true for the Asquith (Aq) soil association. The soil restricts the production of native and tame species of perennial forage crops due to the unavailability of sufficient water in the soil. The Meadow (Mw) soil association is limited by excess water due to poor soil drainage or a high groundwater table. This soil association is only capable of producing native forage crops (SKSIS Working Group, 2018).

The review of SKSIS (2018) and the Saskatchewan Land Resource Unit (SLRU) (Agriculture and Agri-food Canada 2004; 2009) provided digital soil resource information and was used to identify dominant soil types, texture, salinity, erosion potentials, landform/surface expression, and slope classes (**Table 3-3**).

**Table 3-3: Soil Map Units and Associated Soil Characteristics within the Project Study Area**

MAP UNIT	SOIL ASSOCIATION/ COMPLEX	PARENT MATERIAL	DOMINANT/ SUBDOMINANT SOILS	DOMINANT SURFACE TEXTURE	SURFACE EXPRESSION	SLOPE CLASS	SALINITY	AGRICULTURE CAPABILITY
Aq 1	Asquith	Fluvial	Dark Brown Chernozem	Sandy Loam	Undulating	3 (2-5%)	0	5(10)M
Aq3	Asquith	Fluvial	Dark Brown Chernozem	Sandy Loam	Hummocky	3 (2-5%)	3	4(10)M
Br3	Bradwell	Lacustrine	Dark Brown Chernozem	Loam	Undulating	3 (2-5%)	1	3(10)M
Mw2	Meadow	Alluvial	Rego Humic Gleysol	Sandy Loam	Level	1 (0-0.5%)	6	6(10)WM
AqBr 1	Asquith-Bradwell	Fluvial/ Lacustrine	Dark Brown Chernozem	Very Fine Sandy Clay Loam	Undulating	3 (2-5%)	0	4(6)M / 3(4)M

The Blairmore Natural Area Screening Report (EDI, 2022) identified areas of potential soil contamination which included the CN Railway Rail Yard Management site. It was identified that the main potential contaminants of concern were hydrocarbons, polycyclic aromatic hydrocarbons, benzene, toluene, ethylbenzene, xylene, metals, glycols, and solvents. Historical herbicide use is also a potential for soil contamination.

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## 3.4 WETLANDS AND HYDROLOGY

Based on the literature review and field reconnaissance, the site contains four wetlands (**Appendix A; Figure 4**). **Table 3-4** lists the wetlands on site and their associated class. The largest wetland represents 7% of the total site area and is intersected by a linear mounded area, which may be an old rail bed. The identified Class V wetland is an extension of Chappell Marsh which extends southeast of the site.

**Table 3-4: Wetland Classes Present within the Site**

WETLAND CLASS <sup>(a)</sup>	NUMBER OBSERVED	WETLAND AREA (ha)
Class II Wetland	1	0.4
Class III Wetland	1	0.2
Class V Wetland <sup>(b)</sup>	2	9.3
Total	4	9.9

Note:

a) Source: Stewart and Kantrud (1971).

b) The Class V Wetland is intersected by a road into two features.

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### 3.4.1 FISH AND FISH HABITAT

Fish and fish habitat was not identified through the review of previous reports and studies. A desktop review of available imagery and the HABISask online application, conducted in June 2023, noted no confirmed fish or fish habitat within the site.

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## 3.5 VEGETATION

The site is comprised of dense woody vegetation, including but not limited to, native species like Manitoba maple (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), and balsam poplar (*Populus balsamifera*). Non-native woody species found include common caragana (*Caragana arborens*), Siberian elm (*Ulmus pumila*), and scotch pine (*Pinus sylvestris*) among other non-native species. Many invasive species dominate the understory of the RSBAA, including smooth brome (*Bromus inermis*), quack grass (*Elymus repens*), and crested wheatgrass (*Agropyron cristatum ssp. pectinatum*) (EDI, 2022).

During the forested range health assessments completed by EDI (2022), it was observed that some native species have naturalized around native aspen (*Populus tremuloides*) groves within the site. However, rangeland health was determined to be poor due to shrubby encroachment of non-native species (e.g., common caragana, European buckthorn [*Rhamnus cathartica*]).

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### 3.5.1 NOXIOUS AND NUISANCE WEEDS

EDI (2022) documented 16 weed species (summarized in **Table 3-5, Appendix A; Figure 8**; NatureServe 2022). Of the 16 identified, five are designated as Nuisance, and eleven as Noxious under the *Weed Control Act* (2010). Weeds were found to mainly occur within the present utility ROW; however, sporadic occurrences were noted throughout the entire site. In addition to the noted Nuisance and Noxious species, EDI (2022) observed that common caragana is quite common in select areas throughout the RSBAA. Although it is not listed under the *Weed Control Act*,

caragana is an introduced species with aggressive spreading tendencies, often outcompeting local native vegetation (Manitoba Master Gardener Association, 2023).

**Table 3-5: Nuisance and Noxious Weeds Documented Within the Site<sup>(a)</sup>**

COMMON NAME	SCIENTIFIC NAME	WEED CONTROL ACT (2010) DESIGNATION <sup>(b)</sup>
absinthe	<i>Artemisia absinthium</i>	Noxious
blue lettuce	<i>Lactuca tatarica</i>	Nuisance
Canada thistle	<i>Cirsium arvense</i>	Noxious
common dandelion	<i>Taraxacum officinale</i>	Nuisance
common tansy	<i>Tanacetum vulgare</i>	Noxious
European buckthorn	<i>Rhamnus cathartica</i>	Noxious
field sow-thistle	<i>Sonchus arvensis ssp. arvensis</i>	Noxious
foxtail barley	<i>Hordeum jubatum</i>	Nuisance
leafy spurge	<i>Euphorbia esula</i>	Noxious
meadow goats beard	<i>Tragopogon dubius</i>	Nuisance
narrow-leaved hawkbeard	<i>Crepis tectorum</i>	Noxious
nodding thistle	<i>Carduus nutans ssp. leiophyllus</i>	Noxious
oxeye daisy	<i>Leucanthemum vulgare</i>	Noxious
quack grass	<i>Elymus repens</i>	Nuisance
scentless chamomile	<i>Tripleurospermum inodorum</i>	Noxious
baby's breath	<i>Gypsophila paniculata</i>	Noxious

Note:

a) Source: EDI, 2022.

b) Weed species are defined as Prohibited under Schedule I, Noxious under Schedule II and Nuisance under Schedule III of the Weed Control Act (2010). "Nuisance weed" means any plant that is designated by order of the minister as a nuisance weed and includes the seeds or any other part of that plant that may grow to produce another plant.

"Noxious weed" means any plant that is designated by order of the minister as a noxious weed and includes the seeds or any other part of that plant that may grow to produce another plant.

Under the *Weed Control Act* (2010), the City is required to detect and manage populations of prohibited, noxious, and nuisance weeds. Control measures for prohibited, noxious, and nuisance weed infestations include spraying, hand-pulling, grazing, and mowing. See **Table 3-6** below for details on the different weed classes.

**Table 3-6: Definitions and Requirements for the different Weed Classes**

CLASSIFICATION	DEFINITION	REQUIREMENTS
Prohibited	Prohibited weeds are currently rare or non-existent in Saskatchewan. These species pose a threat to native ecosystems and agricultural crops with aggressive spreading tendencies.	Prohibited weeds must be detected early and eradication measures must be implemented.

Noxious	Noxious weeds are defined as species that have been introduced to the province and have spread.	Noxious weed infestations must be contained with control measures applied as necessary. Isolated infestations of noxious weeds (less than five hectares per quarter section) must be eradicated, whereas established infestations (greater than five hectares per quarter section) must be contained and control measures applied.
Nuisance	Nuisance species that are widely established across the province and are considered "problematic" due to ease of spread. Nuisance weed species can include native species (Blue lettuce [ <i>Lactuca tatarica</i> ], foxtail barley [ <i>Hordeum jubatum</i> ], and povertyweed [ <i>Iva axillaris</i> ] (Government of Saskatchewan, 2023).	Nuisance weeds are more widely spread through the province and have become naturalized where the goal of eradication is not feasible.

### 3.5.2 FLORA SPECIES OF MANAGEMENT CONCERN

Within the site, five flora SOMC (Table 3-7) were categorized as having high potential of occurring or were confirmed to be present by EDI during their field reconnaissance in 2021 (Appendix A; Figure 7). Confirmed species include red elderberry (*Sambucus racemose*) and small yellow lady's slipper (*Cypripedium parviflorum var. makasin*). Blue wild rye (*Elymus glaucus ssp. glaucus*), bristle-leaved sedge (*Carex eburnean*), and mucronate blue-eyed-grass (*Sisyrinchium mucronatum*) have a high potential to be present. Additional floral SOMC observed by citizen science are listed in Appendix F.

**Table 3-7: Vegetative SOMC**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	NOTES
blue wild rye	<i>Elymus glaucus ssp. glaucus</i>	S3	Historical observation (1931).
bristle-leaved sedge	<i>Carex eburnean</i>	S3	High likelihood, but not confirmed.
mucronate blue-eyed-grass	<i>Sisyrinchium mucronatum</i>	S3	High likelihood, but not confirmed.
red elderberry	<i>Sambucus racemosa</i>	S2	Confirmed by EDI in 2022.
small yellow lady's slipper	<i>Cypripedium parviflorum var. makasin</i>	S3	WSP observed this species in the open canopy mixed forest community in the southwestern quarter section of 23-03-30 W3M.

Note:

a) Saskatchewan Conservation Data Centre (SKCDC) Tracked Taxa Lists (SKCDC, 2023b).

S4 = Apparently Secure; uncommon but not rare.

S3 = Vulnerable / Rare to Uncommon; at moderate risk of extinction or extirpation due to restricted range, relatively few populations, recent and widespread declines, threats, or other factors.

S2 = Imperiled / Very Rare; at high risk of extinction or extirpation due to a very restricted range, very few populations, steep declines, threats or other factors.

S1 = Critically Imperiled / Extremely Rare; at very high risk of extinction or extirpation due to extreme rarity, very steep declines, high threat level, or other factors.

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### 3.5.3 FLORA SPECIES OF INTEREST TO INDIGENOUS COMMUNITIES

Additional engagement is needed with Indigenous communities prior to preparing content for this section and content must be respectful of any sensitivities with respect to the role and location of important plant species.

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### 3.5.4 FLORA SPECIES OF CONSERVATION OR RESTORATION INTEREST

FSAA have identified the small yellow lady's slipper (*Cypripedium parviflorum var. makasin*) as a special species of conservation interest within the City. This SOMC and its habitat are under threat due to disturbance in the immediate and surrounding area to the RSBBA. The FSAA has a long-term goal of protecting the habitat of this species and aim to see an increase in species within the next 20 years (Friends of the Saskatoon Afforestation Areas, 2023).

The FSAA have identified that restoration should be centered around the inclusion of native species. This would include but is not limited to trembling aspen (*Populus tremuloides*), eastern cottonwood (*Populus deltoides*), northern gooseberry (*Ribes oxycanthoides*), wolf willow (*Elaeagnus commutate*), green ash (*Fraxinus pennsylvanica*), and balsam poplar (*Populus balsamifera*).

A SOMC, red elderberry, has been documented on site by EDI in 2021 and has been historically observed. It typically is not native to the area of Saskatoon; however, it prefers semi-open deciduous or mixed wood habitats and further investigation should be taken to determine if the observed specimen is a native or a horticultural variety, prior to instigating any seed propagation or restoration efforts.

Of the available wildlife information reviewed, five wildlife SOMC have a high likelihood of being found within the site based on habitat requirements. Targeted wildlife summaries are provided in the following sections. A full list of identified wildlife SOMC is captured in the baseline assessment (**Appendix B**).

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## 3.6 WILDLIFE AND WILDLIFE MOVEMENT

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### 3.6.1 MIGRATORY BIRD SPECIES

Within the site, EDI (2022) confirmed observations of 27 avian species belonging to the waterfowl and songbird groups. These include the following five SOMC: bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), horned grebe (*Podiceps auratus*), common nighthawk (*Chordeiles minor*) and lesser yellowlegs (*Tringa flavipes*). These species were confirmed in the wetland and eastern Mixed wood forest portion of the site respectively.

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### 3.6.2 AMPHIBIAN SPECIES

Targeted amphibian surveys conducted by EDI in 2021 surveyed for egg masses, adults, and young of the year by visual or auditory methods. No observations were made during these surveys. However, based on the wetland vegetative communities present, western tiger salamander and the northern leopard frog have a high likelihood of utilizing the site based on historical records and anecdotal observations. Future surveys to check again for these species should be considered.

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### 3.6.3 MAMMALS

Within the site 11 mammals have been documented by EDI (2022). These include coyote (*Canis latrans*), elk (*Cervus elaphus*), moose (*Alces alces*), mule deer (*Odocoileus hemionus*), North American porcupine (*Erethizon dorastum*) racoon (*Procyon lotor*), red squirrel (*Tamiasciurus hudsonicus*) red fox (*Vulpes vulpes*) snowshoe hare (*Lepus americanus*) white-tailed deer (*Odocoileus virginianus*), and white-tailed jackrabbit (*Lepus townsendii*).

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### 3.6.4 WILDLIFE MOVEMENT

The collective results from the remote camera and winter track survey programs conducted at the site by EDI (2022) did not identify any obvious trends or patterns of wildlife movement. However, areas with higher concentrations of conifer species or natural closed canopy woodlands supported a higher diversity of wildlife species. In general, it was noted that wildlife such as fox (*Vulpes vulpes*), coyote (*Canis latrans*), and deer (*Odocoileus sp.*) appear to move in and out of the site predominately in a north-south direction (EDI, 2022). The most frequently observed mammals during the winter track surveys were coyote, white-tailed jackrabbit, and deer. In addition, wildlife was observed to cross Township Road 362A and move between the Class V wetland and the Chappell Marsh Conservation Area. Wildlife appears to be following the margins of the wetland in a north-south direction. It is currently unknown if wildlife travel further south from the Chappell Marsh Conservation Area to the South Saskatchewan River. EDI (2022) did identify that Highway 7 represents a barrier to wildlife movement.

An Ecological Connectivity Evaluation Framework has been provided in **Appendix E**.

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### 3.6.5 FAUNAL SPECIES OF CONSERVATION INTEREST

Although EDI did not observe any amphibians in 2021, two species of conservation or restoration interest may find viable habitat within the site:

- The western tiger salamander has been observed historically in the site in 2020 (SKCDC, 2023 (HabiSask)) recently this species has been anecdotally observed (Pers. Comm. Michael Hill) within the south easter portion of site. It is a species that is predicted to be impacted by climate change, as prolonged and frequent droughts are causing habitat loss and fragmentation between their breeding (e.g., fishless waterbodies) and overwintering grounds (e.g., burrows or debris) (COSEWIC, 2012) and is an excellent indicator of water quality. Protection of suitable waterbodies and connectivity between overwintering and breeding habitat is key in managing this species
- The northern leopard frog (*Lithobates pipiens*) is a COSEWIC listed species that has not been confirmed detected in the site but has a high likelihood of being present. The life cycle of the northern leopard frog consists of three distinct habitat types: deep and permanent waterbodies for the winter, waterbodies such as wetlands for breeding, and moist upland meadows or grasslands for summer (Environment Canada, 2013). It is important for northern leopard frogs to have access to a corridor between these habitats to successfully complete their life cycle

Additionally, five avian SOMC have been confirmed on site. Refer to **Table 3-8, Appendix A; Figure 5** for details. Additional faunal SOMC observed by citizen science are listed in **Appendix F**.

**Table 3-8: Wildlife SOMC Present or Likely to Be Present in the Site**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(A)</sup>	COSEWIC STATUS	SARA STATUS	NOTES
bank swallow	<i>Riparia riparia</i>	S4B, S5M	Threatened	Threatened	EDI Confirmed in 2022.

barn swallow	<i>Hirundo rustica</i>	S4B	Threatened	Threatened	EDI Confirmed in 2022.
common nighthawk	<i>Chordeiles minor</i>	S4B	Special Concern	Special Concern	EDI Confirmed in 2022.
horned grebe	<i>Podiceps auratus</i>	S5B	Special Concern	Special Concern	EDI Confirmed in 2022.
lesser yellowlegs	<i>Tringa flacipes</i>	S4B	Threatened	No Status	EDI Confirmed in 2022.
northern leopard frog	<i>Lithobates pipiens</i>	S3	Special Concern (Prairie/Boreal population)	Special Concern (Prairie/Boreal population)	Unconfirmed but high likelihood.
western tiger salamander	<i>Ambystoma macortium</i>	S4	Special Concern (Prairie/Boreal population)	Special Concern (Prairie/Boreal population)	Unconfirmed but high likelihood.

Note:

a) *Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023c).*

*S1 = Critically Imperilled/Extremely Rare; S2 = Imperilled/Very Rare; S3 = Vulnerable/Rare to Uncommon; S4 = Apparently Secure; S5 = Secure/Common; B = for a migratory species, applies to the breeding population in the province; M = for a migratory species, rank applies to the transient (migrant) population; N = for a migratory species, applies to the non-breeding population in the province; U = status is uncertain in Saskatchewan.*

*COSEWIC = Committee on the Status of Endangered Wildlife in Canada (Government of Canada, 2022); SARA = Species at Risk Act (Government of Canada, 2022); - = not assessed.*

## 3.7 ECOLOGICAL PROCESSES, NATURAL DISTURBANCES, AND HAZARDS

The RSBBA is a landscape located in the southwest part of Saskatoon consisting of wetlands, native grasslands, and forested areas (both afforested and native remnants) (City of Saskatoon, 2020d). With an increase of extreme weather events, (City of Saskatoon, 2020d), wetlands can act as a natural sponge, facilitating in the control of heavy rainfall, and snowmelt. Additionally, wetlands, as well as grasslands and forested areas are natural carbon sinks. These ecosystems can lock a vast amount of carbon, supporting global climate control (City of Saskatoon, 2020d).

In an urban context, large tracts of native grasslands, wetlands, and native forested areas should always be protected. The former two landscapes are declining rapidly in Saskatchewan and globally (MVA, 2017). Kraus (2016) describes native grasslands as “the world’s most endangered ecosystem”; and Ducks Unlimited Canada – Saskatchewan (2016) states that “in some areas of the province, 90 per cent of wetland habitat is gone”. The greatest threats to wetlands and native grasslands are the conversion of these ecosystems to lands usable for agriculture or urban development (City of Saskatoon, 2020d; MVA, 2017).

Detailed site-specific information including one-time periodic natural disturbances, such as fires, floods, eroding slopes, or droughts has been identified as a knowledge gap for this iteration of the NAMP.

### 3.7.1 SITE HAZARDS

Hazards to the RSBBA include the CN Railway Rail Yard Management site as well as commercial areas specifically related to the automotive industry. There is a high chance of soil contamination along the perimeter of the site through accidentally spills of hazardous substances (EDI, 2022). Additionally, city encroachment to the RSBBA and further urban/rural development are other threats the site may face (EDI, 2022). There is potential for

the site to be compromised in size due to encroaching future development. The ecological connectivity will also be endangered as development progresses around the RSBBA. The surrounding matrix might become impenetrable for wildlife, isolating the site and limiting its value within the Integrated Green Network Plan that was put forward by the City of Saskatoon in 2022.

With increased risk of flooding due to climate change, the chance of spreading invasive species such as European buckthorn (*Rhamnus cathartica*) within the RSBBA may be increased. Besides flooding, recreation activities can also introduce other invasive non-desirable species to the site (Liedtke et al., 2020). Residents of the City are using the RSBBA for passive and active recreation (City of Saskatoon, 2019), increasing the likelihood of introducing new, and/or spreading invasive non-desirable species already present. For example, hiking boots and bikes that have not been cleaned properly between usage have a chance of carrying propagules of invasive plants. These hitchhikers are carried around until they loosen from the boot or tire tread and start a new population at the release location (Leave No Trace Center of Outdoor Ethics, 2021). Such accidental introductions or spread will threaten the native and modified species composition present in the RSBBA.

Detailed site-specific information including one-time periodic natural disturbances, such as fires, floods, eroding slopes, or droughts has been identified as a knowledge gap for this iteration of the NAMP.

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### 3.7.2 HAZARDS TO ECOLOGICAL PROCESSES

The presence of the Yellow lady's slipper in the eastern portion of the site (EDI, 2022) indicates that the area used to be a wetter environment, potentially connected to the marsh located in the west. As a result of road construction, power line installation, urban development, the establishment of a facility management area, and the active afforestation work, the landscape evolved and changed to a forested area interspersed with grassland. As these human-caused changes intensify, the current ecosystem is and will be under continued pressure. This threatens the current ecological processes, species composition, and landscape connectivity. The RSBBA is an integral part of the green network of the City of Saskatoon (City of Saskatoon, 2022a). It acts as a corridor for wildlife to move through the landscape (MVA, 2017).

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## 3.8 KNOWLEDGE GAPS

During the baseline summary investigation, several areas where additional information will be required to inform the management and decision-making process were identified. The 'knowledge gaps' have been organized by Soils, Vegetation, Aquatics, and Wildlife.

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### 3.8.1 SOILS

Contamination from CN activities should remain a consideration to the health and condition of soil (and in turn groundwater, and species composition). The CN Railway Rail Yard Management site and perimeter boundary have potential contaminants leaching into the site, but details are unknown, and the effects are understudied. As the community has expressed interest in planting edible species on site, such as food forests, it is critical to have healthy soils prior to planting any edible species. Soil assessment should be undertaken to get insight on the current soil condition.

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### 3.8.2 VEGETATION

- Detailed habitat classification and community distribution do not currently exist for the site and should be further investigated to assist with future management objectives. The current scale of information is coarse, and



therefore it will prove challenging to identify site-specific targets and constraints. For example, acquiring select historical imagery for the area will aid in boundary delineation for the identified natural assets

- Consider undertaking an inventory of naturalized species (e.g., caragana, and scotch pine) that were historically introduced to the RSBBA to refine our understanding of natural feature health and guide future replacement (e.g., replace with native flora to the area) and long-term restoration/enhancement goals
  - Document and map the distribution of current nuisance and noxious weeds to facilitate current and future weed management planning
  - Locate and confirm the presence and non-detection of SOMC that are ranked with a high probability of occurring in the site following industry-acceptable methodologies
  - Confirm presence and location of species observations provided through citizen science (**Appendix F**)
  - Reaffirm the presence of small yellow lady's slipper and red elderberry to refine the spatial extent, population size and health of these species in order to develop sound management objectives/plans. FSAA have provided estimated coordinates for these species that can be reviewed during further baseline data collection
  - Consider undertaking a targeted soil investigation to confirm the soil classifications noted to increase the probability of success when developing native restoration/enhancements and identifying areas of elevated erosion risk
  - Consider creating management units that incorporate ecosystem health and habitat type to aid in monitoring, maintenance, and management for the development of objectives in the NAMP
- 

### 3.8.3 AQUATICS

- Chappell Marsh is a large permanent wetland that is connected to the large central wetland present within the RSBBA. This feature may potentially serve as suitable habitat for fish if seasonal hydrological connectivity to the South Saskatchewan River exists and anoxic conditions do not persist during the winter. Therefore, consider undertaking a fish and fish habitat assessment of this permanent wetland to complete our understanding of the baseline aquatic use. This information may also inform/limit what infrastructure may be allowed during future planning exercises
  - Personal communication with Michael Hill, City of Saskatoon, has indicated that the marsh is currently dry, which may be due to a culvert installed at an incorrect elevation, being plugged or both. This issue requires further investigation
  - Water quality is currently unknown. Consider undertaking a water chemistry analysis to develop a baseline water quality understanding for future use targeting any contamination run on or for the consideration of infrastructure planning and targeted restoration/rehabilitation (as required)
  - Consider developing a drainage/climate resiliency plan to inform trail infrastructure placement and expected pre-development run on to sustain the RSBBA
  - Undertake hydraulic-hydrologic modelling to understand the pre-development hydrological regime supporting the various wetlands located in the RSBBA. Watershed/catchments should be defined in order of impacts from infrastructure installations within and land use changes that may be proposed directly adjacent to the RSBBA
- 

### 3.8.4 WILDLIFE

- Verify if high probability and confirmed species are utilizing areas within the site as part of their natural lifecycle as direct management objectives may be required to sustain the species noted. At this time, horned grebe, lesser yellow legs, common nighthawk and barn swallow have been confirmed within the site by EDI (2022). Northern leopard frog and the western tiger salamander of having a high likelihood of being detected within the site but have not been observed to date (EDI, 2022)
- Baseline information pertaining to medium to large-sized (e.g., Elk [*Cervus elephus*], Moose [*Alces alces*], Deer [*Odocoileus sp*], North American porcupine [*Erethizon dorastum*]) terrestrial mammal use is limited in the documentation provided. Consider targeted surveys to develop a better baseline understanding of habitat use

and seasonal movement in the context of the site boundary. This information may be useful when considering infrastructure placement (e.g., trails, roads) and wildlife management objectives

- Consider inventorying any existing bird houses or bird feeders (providing location, material, and frequency of maintenance). Maintained supportive structure can act as an attractant. However, unmaintained bird houses can host insects, fungus, and mites which are detrimental to avian health. In addition, the feed used could represent a vector for the introduction of undesirable flora species. The FSAA fills, cleans, and maintains two bird feeders west of SWOLRA and the west site of RSBBA. Feeders are filled with seeds in the winter months when snow is on the ground, thus, by spring melt most of the seeds are gone and the likelihood of spreading exotic species is minimal. Cleaning and maintenance occur twice a year (spring and fall). Similar data should be gathered for the remaining bird feeders on site
- Arthropod documentation was unavailable at the time of review. Consider completing inventories to determine which species are present to inform restoration/enhancement plans (target host plants for specific species)
- Confirm presence and location of species observation provided through citizen science (**Appendix F**)

# 4 HUMAN CONTEXT

To comprehend human pressures and potential opportunities on the project site, understanding its past, present, and future context from a human perspective is crucial. This involved reviewing what is known about the historical and cultural landscape, as well as past, present, and future site uses. This information will be used in future sections of the NAMP to create a site-specific Situation Analysis (see Section 5 – Conservation Plan).

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## 4.1 HISTORICAL AND CULTURAL LANDSCAPE

Historical and Cultural significance considers the past human uses of the site, historically significant features located on site, and known cultural significance. The findings presented here summarize known information to date, however further studies are recommended to gain a more comprehensive understanding of the historical and cultural landscape. Further studies and engagement with Indigenous communities are recommended to better understand the cultural significance of the site.

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### 4.1.1 HISTORICAL & CULTURAL SIGNIFICANCE

The RSBBA was established in 1960 with the intention of creating a greenbelt around Saskatoon. The area was named after Richard St. Barbe Baker, an internationally recognized forestry advisor and conservationist, who advocated for tree planting and reforestation efforts around the world. Described as the “first global conservationist” (University of Saskatchewan, n.d.), Richard St. Barbe Baker received post-secondary education at the University of Saskatchewan in 1910-1911. Following his studies in Saskatoon, he founded the conversation group Men of the Trees, which gained respect among several nations (Palestine, New Zealand, United States of America, and Africa), and which became a core cause in his life. Richard St. Barbe Baker has left a lasting legacy in Saskatoon, so much so, that an archival collection of personal works, photographs, and video were gifted to the University of Saskatchewan. He has even been credited with inspiring the urban forestry movement in Saskatoon (University of Saskatchewan, n.d.). In 2013, the Baha’i community of Saskatoon partnered with Meewasin to install signage at the RSBBA honoring the area’s namesake.

The greenbelt creation started with Bert Wellman of the Saskatoon Planning Department who walked the perimeter of Saskatoon selecting areas of scenic beauty. Along with City Planner Bill Graham they planted trees adjacent to the proposed Circle Drive Parkway, including the site which is now RSBBA. Planting of the area began with drought tolerant, native, and non-native species. In 1972, City Council approved the land as an afforestation area, protecting it in perpetuity. It is understood that the goal surrounding the creation of this green space was to “improve the future environment of the City” (City of Saskatoon, n.d.b). Tree selection and material for planting at the RSBBA was advised upon and supplied by the Federal Government’s Prairie Farm Rehabilitation Administration (PFRA) (Adamson, n.d.). Created in 1935, the PFRA was an administrative branch of Agriculture and Agri-food Canada as a response to the prairie droughts of the 1930’s (Canadian Encyclopedia, 2020). In addition to multiple community pastures, a tree nursery in Indian Head, Saskatchewan, distributed tree seedlings to communities and farmers free of charge to slow land degradation and increase biodiversity across the prairies. Since the de-funding and closure of the PFRA in 2013, trees provided by the PFRA and planted across the prairies have changed the landscape and should be considered historically significant.

## HERITAGE REVIEW

In its heritage screening for Blairmore Sector, EDI (2022) confirmed there were no archeological sites of heritage concern within the RSBBA. However, Chappell Marsh is comprised of terrain that may have the potential to host archeologically sensitive sites. The Bone Trail, a Municipal Heritage Property featuring wheel ruts of a former historic trail, is located nearby in the Rural Municipality of Corman Park. Three quarter sections adjacent to the southeast of the RSBBA were reported to have moderate to high potential to discover intact archaeological sites (NE/NW/SE-13-26-6-W5M) that are archeologically significant (EDI, 2022).

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## 4.2 PAST, CURRENT, AND FUTURE LAND USES

Past and current land uses of RSBBA have left the site in various stages of ecological health. Analyzing these uses is essential to understanding the root causes behind disturbance and threats to the ecological communities and will help to inform future recommended land uses.

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### 4.2.1 PAST LAND USES

The RSBBA has a long history of human use, with recorded data as far back as the 1800s when it was used as a homestead by William Kennedy Esq. The City purchased RSBBA in 1960. In 1972, tree planting initiatives were conducted by the City, (City of Saskatoon, n.d.b) (see Section 4.1.1 – Historical and Cultural Significance for additional information). Since its formal establishment, community members have used the afforestation area for a variety of activities, such as walking, hiking, and, in the 1980s, as a training ground for dog sledding. The site has also been historically utilized by CN rail, which is evidenced by the remnants of the abandoned branch line oriented north to south through the eastern portion of the site.

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### 4.2.2 CURRENT ON-SITE USES

The RSBBA is currently host to both ecological and recreational uses including an off-leash dog park, a BMX skills park, fat tire biking, and citizen science. The land use surrounding the RSBBA is currently a combination of conservation, agricultural, residential, and industrial uses (**Appendix A; Figure 9**). A portion of the RSBBA is within the Meewasin's Conservation Zone, under the *Meewasin Valley Authority Act*, established in 1979. Meewasin is a non-profit organization created to conserve both natural and cultural resources and features located within the South Saskatchewan River Valley (MVA, 2023). Conservation groups, such as FSAA have also voluntarily taken responsibility as stewards of the RSBBA. FSAA empowers users, stewards, and stakeholders to care for the RSBBA responsibly and works to provide community opportunities for residents of the City to take pride in the conservation of the site. A summary of each current land-use is provided below.

**Passive Recreation Uses:** The RSBBA functions as a natural area for visitors to interact with and appreciate one of the few afforestation areas in Saskatoon. The area supports nature enthusiasts who use the site for passive uses, such as walking/hiking, birdwatching, and photography. The extensive trail system of natural surface trails currently supports a variety of user groups through the site.

**Active Recreation Uses:** The RSBBA currently supports a variety of active recreational uses, described below:

- Biking (all-season): The RSBBA is a popular destination for both summer and winter (fat tire) biking. The Fatlanders Fat Tire Brigade currently have a user agreement with the City and have been active in the advocacy and maintenance of the trail system at RSBBA for fat tire biking
- Skills Biking: The Cedar Villa Bicycle Trails group also has a user agreement with the City to use an area within the western portion of the site to support the development of biking skills related to BMX. The Cedar Villa Bicycle Trails group has built and maintained a skills course and related infrastructure to support the sport

- Off-Leash Dog Exercise: The South-West Off-Leash Dog Park (5.8 ha; SWOLRA) is in the eastern portion of the site and has been in operation since 2013. The off-leash dog park is a popular destination for local users to exercise their dogs within this fenced-in area

**Educational Uses:** The Friends of the Saskatoon Afforestation Areas provides ecological education programming to increase public awareness of the unique heritage and ecological context of the area. This group also has a user agreement with the City to install and maintain interpretive signage.

**Unsanctioned Uses:** The site, while beloved by the community, is used for undesirable and unsanctioned uses. The legitimate user groups have notably attempted to discourage these uses. Unsanctioned uses include:

- Off-leash dogs: There are reports of off-leash dogs being allowed to roam outside the boundaries of the South-West Off-Leash Dog Park, particularly the eastern portion of the site. Off-leash dogs pose a significant threat to the biodiversity of the site and other users, including disrupting wildlife and spreading disease
- Illegal hunting: Hunting has been noted to occur on site, which poses a risk to both the safety of users and disruption to wildlife
- Illegal dumping: While efforts to curb illegal dumping on the site have been largely successful, dumping occasionally still occurs. Dumping of household waste poses risks to the health of the site and to people
- Illegal vehicular use: Illegal use of the site has been noted to occur. A notable example is snowmobiles, which have been reported to cross into the site from Range Road 362A over the wetlands when frozen in the winter
- Illegal fires: There are reports of the area being used for bush parties where occupants leave behind fire pits, broken glass, and other damage

**Private Easements:** CN, TransGas, and SaskPower have easements and considerations within the RSBBA. See Section 1.2 – Project Location and Local Context for a full summary.

### CURRENT HUMAN IMPROVEMENTS (ON-SITE)

An inventory of the current features, including access routes and infrastructure, has been catalogued and listed below (Table 4-1).

**Table 4-1: Existing Feature Inventory for the RSBBA**

EXISTING FEATURE	DESCRIPTION
1. Existing Access Route(s) & Parking Lots	<p>The site is currently accessed from four formal access points with parking lots, and various informal access points along the property line. There are several notable challenges to accessing the site from the formal access points:</p> <ul style="list-style-type: none"> <li>— The northeast parking lot is owned by TransGas, which has stated a desire for the City to discourage the general community from accessing the site via this lot</li> <li>— The southeast parking lot has limited vehicle capacity and poor surfacing</li> <li>— The SWOLRA parking lot is utilized heavily by both dog walkers and other site users. There have been reports of the parking lot reaching capacity, and vehicles parking along the Township Road, creating a safety concern</li> <li>— Adjacent to the western entrance is a rail crossing and gate to control access across the active CN rail line. Trains do occasionally stop along the rail line, thereby temporarily blocking quick access in and out of the site. Access from the western entrance has been reported to be actively used for agricultural equipment to access nearby fields</li> </ul>

EXISTING FEATURE	DESCRIPTION
2. Existing Trails	<p>24 trails for mountain or fat biking and 22 trails used for hiking or trail running are used year-round (Tourism Saskatchewan, n.d.a) and named the Winter Trail Network.</p> <p>Perimeter trails are used more heavily by bikers and hikers while internal trails are used less frequently (Trail Forks, 2023).</p>
3. Existing Site Furniture & Waste Receptacles	<p>There are four seating nodes with benches in good repair. A set of chairs and a homemade bench have been placed in the site by users of the RSBBA.</p> <p>Three bird feeders and one bird house maintained by the FSAA.</p> <p>Six trash receptacles are located throughout the site.</p>
4. Existing Fences & Barriers	<p>Minimal barriers are present to limit vehicles beyond access points into the RSBBA. Jersey barriers at the northeast and southeast parking lots.</p> <p>There is limited fencing at the site. Existing fencing includes a partial chain-link/partial wire fence encircling the SWOLRA, and a chain-link fence along part of the southern boundary, blocking access near Cedar Villa Estates.</p> <p>Concrete Blocks are present at the access point on the west edge of the RSBBA.</p>
5. Existing Signage	<p>Several signs and trailhead maps/markers are located along trails. Site signage is in fair to good condition.</p> <p>Three identification signs are present to orient users and provide information about the RSBBA.</p> <p>Signs identifying bylaws are present throughout the RSBBA.</p>
6. Existing Utilities & Services	<p>ROW for and easements for CN Rail, SaskPower, and TransGas are present throughout the site. See Section 1.2 – Project Location and Local Context for a full summary.</p>



Figure 4-1: Northeast Parking Lot



Figure 4-2: Off-leash Parking Lot



Figure 4-3: Typical Trail



Figure 4-4: Bird Feeder #2 Filled by FSAA During Winter Months



Figure 4-5: Bench in Good Repair



Figure 4-6: Bench in Good Repair



Figure 4-7: Homemade Bench



Figure 4-8: Bird Feeder #3 Installed by Persons Unknown



Figure 4-9: Garbage Receptacle in Poor Condition



Figure 4-10: Chair and Sunscreen Station Installed by Users of the RSBAA



Figure 4-11: Garbage Receptacle in Fair Condition



Figure 4-12: South West Dog Park Entrance



**Figure 4-13: Concrete Barriers**



**Figure 4-14: Trail Network Sign**



**Figure 4-15: Typical Trail Marker**



**Figure 4-16: Dog Park and RSBBA Signs**



**Figure 4-17: Powerline at the West Side of Chappell Marsh**



**Figure 4-18: Fence at Northern Boundary of Off Leash Dog Area in Good Repair**



**Figure 4-19: Jump Ramp at BMX Bike Area**



**Figure 4-20: Small Bridge in RSBBA Path in Fair Condition**



## CURRENT OFF-SITE USES (ADJOINING AND ADJACENT LANDS)

**Conservation:** Two conservation areas are located near the RSBBA:

- **Chappell Marsh Conservation Area** is a 148-acre site owned by Ducks Unlimited Canada (DUC) that is dedicated to the restoration and conservation of prairie wetland habitats (Ducks Unlimited Canada, 2023). It is located south of the RSBBA in the Rural Municipality of Corman Park. Open to the public since 2011, it offers educational and recreation opportunities for visitors to learn from and enjoy the habitat of many wildlife species including ducks, insects, birds, amphibians, reptiles, and mammals (Montgomery Place, 2011). It also offers a network of groomed trails with benches, interpretative signs, and a shelter for educational programs
- **George Genereux Urban Regional Park** is a 147.8-acre natural area northwest of the RSBBA and is the only other official afforestation area in the City. Like RSBBA, GGURP does not have a formal level of service, and FSAA have been providing some site stewardship. Residents have been reported to access the site informally for activities such as snowshoeing and cross-country skiing, birding and wildlife viewing (Tourism Saskatchewan, n.d.b). Illegal or unsanctioned activities such as dumping also occur on site

**Agricultural Use:** Cultivated cropland surrounds the RSBBA with the exception of adjacent conservation areas.

The RSBBA is surrounded by agricultural lands consisting of cultivated fields. The area north of the RSBBA has historically been cultivated.

**Residential Developments & Private Residence:** Three residential areas are located near the RSBBA:

- **Cedar Village Estates** is located to the south of the RSBBA. Developing new trails could tie into this development to provide easier access for nearby residents
- **The Blairmore Suburban Development Area** is located north of the RSBBA. Currently the east edge of the area has been developed. The area is divided by the west swale that also connects to the RSBBA. There is potential for a trail system to connect the two areas
- **Montgomery Place** neighbourhood is located northeast of the RSBBA and was developed after the Second World War (City of Saskatoon, 2018), as part of the *Veterans Land Act* in 1942. Trails could tie into this developed neighbourhood to provide easier access for nearby residents

**Industrial Use: Saskatoon Civic Operations Center**, located to the east of the RSBBA, which houses the City's transit headquarters, storage barns, as well as the public works department and City yards. The western portion of this center is used for snow storage during the winter months.

**Transportation & Rail Use:** The north edge of the RSBBA is abutted by CN Railway Rail Yard Management site.

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## 4.2.3 FUTURE LAND USES

### FUTURE ON-SITE USES

Future site uses are expected to increase as Saskatoon's population grows and the surrounding Blairmore Sector is developed.

During the stakeholder engagement as part of the formation of the NAMP, requests were made to consider additional uses of the site. These uses were considered by the NAMP team; however, each use must not contravene the historical or ecological integrity of the site. Compatibility of future uses with historical features and ecological sensitivities should be considered when future uses are proposed.

### FUTURE OFF-SITE USES (ADJOINING AND ADJACENT LANDS)

As the City continues to develop, it is assumed that residential and private developments will advance around the RSBBA (and adjacent conservation areas). As the City becomes more densely populated, there will be noticeable

pressures on the RSBBA in terms of ecological and historical protection. Plans for the Blairmore Sector included a Natural Area Screening Study, identifying significant historical and ecological features to continue development in an environmentally responsible manner (EDI, 2022).

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## 4.3 DATA GAPS

The following data is required to support future initiatives on site:

- Cultural significance of the site from an Indigenous perspective
- Location of any historically significant features
- Detailed condition of all trails and amenities
- Data on the quantity and frequency of site users
- Full inventory and certified surveyed location of all trails and amenities
- Certified survey of the property line, ROWs, and utilities
- Topographic survey for the western portion of the site

# 5 CONSERVATION PLAN

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## 5.1 METHODOLOGY

For the purposes of the NAMP the Conservation Plan (CP) shall be defined as a compilation of the Targets (Conservation Targets & Human Well-Being Targets), Critical Threats, Indirect Threats, Opportunities, Goals, Strategies, and Actions, and Objectives. The aim of the CP is to produce a site-specific Action Plan by analyzing the available data and producing an actionable and measurable plan for the long-term management of the site.

Development of the CP follows the multi-step methodology prescribed by the Conservation Standards and incorporates elements of the International Principles and Standards for the Practice of Ecological Restoration, 2<sup>nd</sup> Edition (the Standards; Gann, 2019). As such, the NAMP team first assessed the site through the following steps:

- 1 **Targets**, both Conservation Targets and Human Well-Being Targets, were identified to guide the ultimate aims of what the project intends to conserve. A **Reference Ecosystem** was identified for which to measure future restoration objectives.
- 2 Targets were then assessed by means of a **Viability Assessment** of Key Ecological Attributes and their Indicators, and identification of **Restoration Feasibility**.
- 3 **Direct Threats**, both Conventional Threats and Climate Threats to the Targets, were then identified and assessed.
- 4 **Indirect Threats** and **Opportunities** were identified to understand the driving forces behind the Direct Threats.
- 5 To visualize the complete situation and forces acting on the site, a **Situation Model** was developed which is a visual representation of the relationship between the Targets, Direct Threats, Indirect Threats, and Opportunities.

The NAMP team then developed a “plan” for the management of the site, which consists of the Goals, Strategies, Actions, and Objectives. Together these form the Action Plan. To achieve this, the following steps were undertaken:

- 1 **Goals** were identified to represent the ultimate ideal state of each Target.
- 2 **Strategies** and their assumed results were then identified and compiled into **Results Chains**. The Results Chains indicate the abatement of a Critical Threat and the relationship between the assumptions which lead to achievement of a Goal.
- 3 For each Strategy, **Actions** were identified to represent the tasks required to be completed as part of each Strategy.
- 4 **Objectives** were then identified to support each Strategy.
- 5 Together the Goals, Strategies, Actions, Results, and Objectives form the final **Action Plan** which can be implemented and measured for success.

The CP represents a collaboration between the City of Saskatoon, the NAMP team, and certain stakeholders. Stakeholders were identified by the City of Saskatoon and some of them were engaged to provide initial feedback on each element of the CP. A list of the rightsholders and stakeholders is provided in **Table 1-1** Rightsholders and Stakeholders, including their interest in the NAMP.

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## 5.2 TARGETS

As the first step in the process, a select list of **Targets** was identified to inform Goal setting, determining Actions, and measuring effectiveness (CMP, 2020). Two types of Targets were identified: Conservation Targets, and Human Well-Being Targets. **Conservation Targets**, or biodiversity targets, are site-specific, tangible entities the project is working to conserve; represent and encompass the ultimate aims of the project (CMP, 2020). **Human Well-Being Targets** focus on those components of human well-being affected by the status of conservation targets and associated ecosystem services (CMP, 2020).

### TARGET SELECTION PROCESS

Targets were selected by first engaging with stakeholders (see **Table 5-2**) at workshops composed of select user-groups and interested parties, some of which are listed as stakeholders in **Table 1-1** Rightsholders and Stakeholders. Post stakeholder engagement, the initial site-specific Targets were then reviewed by the NAMP team and refined for specificity to the site based on knowledge gained in previous environmental assessments. The following table outlines the initial Targets identified by the stakeholders and the response by the NAMP team during the refinement process.

**Table 5-1: Initial Targets & Refinement**

TARGETS IDENTIFIED BY STAKEHOLDERS	REFINEMENT BY NAMP TEAM
Forests	No change.
Wetlands	No change.
Recreation	No change.
Education	Incorporated under the Target of "Education & Connection to Nature".
Cultural Identity	Incorporated under the human well-being Target of "Historical & Cultural Connection".
Research	Incorporated under the Target of "Education & Connection to Nature".

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### 5.2.1 CONSERVATION & HUMAN WELL-BEING TARGETS

The final list of Targets and corresponding sub-targets is provided in **Table 5-3**. Subsequent subsections provide a description of each Target and where they occur.

**Table 5-2: Targets**

TARGET TYPE	TARGET	SUB-TARGET
Conservation Target	Forests	Remnant Forest
		Afforested/Modified Forest
	Wetlands	Wetlands, Wetland Complex, and Hydrological Systems
	Species of Management Concern	Bank Swallow
		Barn Swallow
		Common Nighthawk
		Culturally Significant Species
		Horned Grebe
		Lesser Yellowlegs
		Northern Leopard Frog
		Small Yellow-Lady's Slipper
		Snake Hibernacula for garter snakes
		Western Tiger Salamander
Human Well-Being Target	Historical & Cultural Connection	Richard St. Barbe Baker & Foundation of the Afforestation Area
		Indigenous Connection
	Education & Connection to Nature	Education
		Connection to Nature
	Recreation	Passive Recreation
		Active Recreation

### 5.2.1.1 FORESTS – CONSERVATION TARGET

The forest target represents both the modified and unmodified forest communities within the site. These communities are comprised of dense woody vegetation, including common caragana, Siberian elm, Manitoba maple, and green ash among others. Many invasive species dominate both the understory and canopy of the RSBBA. Understory invasives include smooth brome, quack grass, and crested wheatgrass (EDI, 2022), while canopy invasives include scotch pine, Siberian elm, and Colorado blue spruce (*Picea pungens*).

These forest communities provide essential ecosystem services, some of which include nesting, roosting, feeding, and overwintering habitat for wildlife species; corridors for large migrating mammals; carbon sequestration; and air quality improvement. Located across the entire site, only fragmented by trails and utility corridors, the forest community is also important culturally to various user groups, with many popular trail systems running beneath its branches.

#### REMNANT FOREST

Some native forest communities are present in the RSBBA. Remnant trembling aspen stands with sporadically occurring balsam poplars are found in the southern portion of 22-36-06 W3M. The understory of these forest communities is comprised of red-osier dogwood (*Cornus stolonifera*), chokecherry (*Prunus virginiana*), and prickly rose (*Rosa acicularis*); and the ground cover consists of smooth brome. Native forest in the southwestern portion of 23-36-06 W3M is dominated by the same plants mentioned above with the addition of saskatoon and western

snowberry (*Symphoricarpos occidentalis*). The forests in the southeastern portion of 23-36-06 W3M are dominated by shrubs red-osier dogwood, chokecherry, and American black currant (*Ribes Americanum*), interspersed by trembling aspen. The understory is mainly comprised of Canada thistle (*Cirsium arvense*) and stinging nettle (*Urtica dioica*). These forest communities provide nesting and roosting opportunities, overwintering habitat for wildlife, landscape connectivity, carbon storage, air quality improvement, and recreation opportunities. These native forest patches also provide habitat specifically for SOMC (e.g., barn swallow, nighthawk).

### AFFORESTED/MODIFIED FOREST

The afforested areas in the RSBBA are characterized as open canopy mixed woodland. Dominant vegetation species by location are listed below.

**Table 5-3: Dominant Forest Species by Land Location(a)**

LAND LOCATION	DOMINANT SPECIES
Southern portion of 22-36-06 W3M	<ul style="list-style-type: none"> <li>— Poplars, scotch pine, green ash, common caragana, and blue spruce</li> <li>— Smooth brome and black medic (<i>Medicago lupulina</i>) occur sporadically</li> </ul>
Southwestern portion of 23-36-06 W3M	<ul style="list-style-type: none"> <li>— Poplars, green ash, common caragana, and blue spruce</li> <li>— crested wheatgrass, smooth brome</li> <li>— blue aster (<i>Symphotrichum laeve var. geyeri</i>) and common yarrow (<i>Achillea millefolium</i>) occur sporadically</li> </ul>
Southeastern portion of 23-36-06 W3M	<ul style="list-style-type: none"> <li>— Scotch pine, blue spruce, green ash, Siberian elm, Manitoba maple</li> <li>— Canada thistle, stinging nettle</li> <li>— western snowberry and small yellow lady slipper (provincially listed species) occur sporadically</li> </ul>

Source: EDI (2022)

Besides the ecological values of habitat provision, carbon storage, air quality improvement, and landscape connectivity, the afforested areas also bring cultural significance. The area was named after Richard St. Barbe Baker, “the Man of the Trees”. He was a conservationist who advocated for tree planting and reforestation efforts around the world. This naming convention has strong heritage value and creates a connection with the community as he spent time in Saskatoon to promote his environmental initiatives which led to the idea of urban forestry in Saskatoon (University of Saskatchewan, n.d.). Other cultural benefits of the RSBBA are the opportunity to recreate and connect with nature.

### 5.2.1.2 WETLANDS – CONSERVATION TARGET

Wetlands are a significant feature of the RSBBA and the surrounding area. They represent approximately 7.4% of the site. Conserving wetlands has significant benefits to both natural ecosystems and to humans through ecosystem service provision. The sub-target described below explains the benefits of wetlands.

#### WETLANDS, WETLAND COMPLEX, AND HYDROLOGICAL SYSTEMS

Wetlands can be found in two locations on site, with the largest oriented north to south through the middle, and with one smaller wetland in the eastern portion of the site.

The wetlands play a significant role in the local biodiversity, water filtration and purification, flood control, carbon sequestration and storage, and habitat. They also offer a wonderful opportunity for passive recreation and education (e.g., bird watching, meditation, photography). It is estimated that the wetlands in the RSBBA (9.9 ha), through ecosystem services, provide a total annual monetary value of approximately \$32,012 (City of Saskatoon, 2020). The wetlands are home to a variety of flora and fauna, providing a valuable water source for birds, pollinators, and other

wildlife. Conservation of this ecological feature is becoming increasingly important as wetlands are declining rapidly in Saskatchewan (Ducks Unlimited, 2016). Wetlands can be found in two locations on site, with the largest oriented north to south through the middle, and with one smaller wetland in the eastern portion of the site.

### 5.2.1.3 SPECIES OF MANAGEMENT CONCERN – CONSERVATION TARGET

Species of management concern are present in the RSBBA. Most of the species listed below are referred to as SOMC due to some form of habitat decline. Preserving threatened habitat communities will help in conserving SOMC and their function in the ecosystem. Conversely, conserving SOMC will improve habitat and ecosystem health. The following SOMC have been selected based on confirmed presence and through stakeholder engagement to indicate the status of RSBBA's ecosystem health.

Note, the red elderberry was considered as a sub-target but ultimately not included since there is evidence that it is a garden escapee or horticultural variety. Further investigation should be conducted to confirm this species and if it is native to the area. If confirmed, it could be added as a sub-target during future NAMP revision.

#### **BANK SWALLOW**

The bank swallow is a bird species that is found in natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stockpiles of soil situated near open terrestrial habitat. Nests are burrowed into loose bank soil, near water (COSEWIC, 2013). It is likely that the species is more frequently occurring closer to the South Saskatchewan River, where nesting habitat may be available. The bird is listed as 'threatened' on the *SARA* and confirmed to be seen incidentally at the north-eastern portion of the site (EDI, 2022), which could be part of an observation buffer around the river. Bank swallows are valuable to the ecosystem by controlling insect populations and, thus, aiding in pest management.

#### **BARN SWALLOW**

Barn swallows are found in suburban areas, agricultural fields and habitats with open areas for foraging. Nesting occurs largely on artificial structures, including barns, garages, houses, bridges and road culverts, as well as cliffs, where there is a source of mud for building material (Cornell University, 2023; COSEWIC, 2021a). The bird is listed as 'threatened' in accordance with *SARA* and was confirmed by EDI (2022) near the permanent wetland in the center of the RSBBA (EDI, 2022). Barn swallows contribute to pollination and seed dispersal, as well as pest control by consuming large amounts of insects each day.

#### **COMMON NIGHTHAWK**

The common nighthawk breeds in a variety of habitats adjacent to open areas for foraging, such as beaches, sand dunes, logged and burned areas and forest clearings. Nests are built on short-grasses, bare patches, rocky areas and settled areas (roof tops) (Cornell University, 2023). The bird is listed as 'threatened' and was confirmed to be seen on site near the permanent wetland in the center of the RSBBA (EDI, 2022). As an aerial insectivore, nighthawks serve a fundamental function in the ecosystem by providing data on poorly monitored insect populations.

#### **CULTURALLY SIGNIFICANT SPECIES**

The RSBBA features a variety of plants that may be considered culturally significant species such as pasture sage, sweetgrass, and wolf willow. These plant species, and others, are essential to the Plains Cree, Saulteaux or Plains Ojibwe, Dakota, and the Nakoda or Assiniboine First Nation cultures, as well as Métis communities. The plants are used for medicinal, ceremonial, and consumptive uses. Sweetgrass, for example, is used a ceremonial plant in smudging, art, and basket weaving. The plants named here are not an exhaustive list. Input from Indigenous communities should be gathered, and species provided should be added to the list issued in Section 3.5.3 Flora Species of Interest to Indigenous Communities.

### **HORNED GREBE**

The horned grebe breeds in semi-permanent or permanent fresh to brackish water ponds, marshes, and shallow lake bays with vegetated borders (COSEWIC, 2009). The bird is listed as ‘special concern’ and confirmed to be seen within the open water areas of the permanent wetland in the center of the RSBBA (EDI, 2022). The presence of the horned grebe in aquatic ecosystems helps balance the food chain as the bird controls small fish and invertebrate populations. The horned grebe’s nests also provide shelter for other water birds.

### **LESSER YELLOWLEGS**

The lesser yellowlegs is usually found in fresh and brackish wetlands, lake and pond shores, mudflats, marshes, and flooded fields. They nest on the ground in a depression within 200 m from a water source (Cornell University 2023; COSEWIC, 2021b). The bird is listed as ‘threatened’ by COSEWIC but not yet listed on the *Species at Risk Act*. This shore bird has been confirmed within the emergent zone of the permanent wetland in the center of the RSBBA (EDI, 2022). They often flock with other shorebird species, giving the ecosystem a greater complexity. As they feed on aquatic insects, the lesser yellowlegs also controls insect populations.

### **NORTHERN LEOPARD FROG**

The northern leopard frog requires aquatic and upland habitat to complete their life cycle. They breed in a variety of riparian areas and hibernate in upland habitat that contain sandy soils with sufficient detritus to provide thermal cover (Environment Canada, 2013). The frog is listed as ‘special concern’ and has historically occurrences on site (EDI, 2022). Due to their wide range of habitat uses, amphibians are good bio-indicators (Environment Canada, 2012). This means that based on amphibian well-being, other habitat changes, like watershed drainage or habitat fragmentation, can be identified.

### **SMALL YELLOW-LADY'S SLIPPER**

The provincially listed S3 small yellow lady’s slipper was observed in the eastern portion of the site. Orchids, like the small yellow lady's slipper, play an important role in ecosystems. They often have specialized relationships with certain fungi, forming mycorrhizal associations that help with nutrient uptake and plant growth. These interactions contribute to the overall health of forest ecosystems.

### **SNAKE HIBERNACULA**

A site visit by the City of Saskatoon (Pers. Comm. Jessie Best) confirmed the presence of a garter snake hibernacula. The hibernacula are located just to the west of the SWOLRA parking lot. A hibernaculum is a place where snakes seek refuge during the winter months. The conservation of this feature is essential for the survival of the garter snakes as it provides shelter and warmth. A setback distance of 200 meters (year-round) is recommended by the Alberta Master Schedule of Standards and Conditions (AEP 2021).

### **WESTERN TIGER SALAMANDER**

The western tiger salamander is usually found in grasslands, parkland, and meadows. Essential habitat features include sandy soils surrounding semi-permanent to permanent waterbodies that lack predatory fish (COSEWIC, 2012). The salamander is listed as ‘special concern’ on the *Species at Risk Act* and has historically occurrences on site (EDI, 2022) and has been anecdotally observed (Pers. Comm. Michael Hill) within the southeastern portion of site. Salamanders have an important ecological role. Besides controlling pests, they are exceptional indicators for ecosystem health. The salamander’s permeable skin can absorb toxic substances, which could result in a population decline. If this occurred, it could indicate that something is out of balance in the ecosystem. Additionally, due to salamanders’ life cycle and their migration habits, salamanders connect aquatic and terrestrial ecosystems and move energy between them.



#### 5.2.1.4 HISTORICAL & CULTURAL CONNECTION - HUMAN WELL-BEING TARGET

Historical and Cultural Connection refers to the opportunities for connection to the RSBBA's historical and cultural significance. The RSBBA has a long history of use, and a positive historical connection in its namesake, Richard St. Barbe Baker. This target aims to highlight the importance of the history and cultural of the site, including that of the Indigenous communities.

##### *RICHARD ST. BARBE BAKER & THE INCEPTION OF THE AFFORESTATION AREA*

Honoring the founder of the afforestation area, Richard St. Barbe Baker has been identified as a sub-target which is in line with the wishes of the stakeholders. This target includes Richard St. Barbe Baker himself, as well as his legacy of conservation and tree planting.

##### *INDIGENOUS CONNECTION*

The sub-target of "Indigenous Connection" refers to fostering a cultural connection through the lens of the Indigenous communities. The site is home to plants and wildlife species which have a recorded significance with Indigenous communities. Further engagement is required with the appropriate communities to define the specifics of the sub-target.

#### 5.2.1.5 EDUCATION & CONNECTION TO NATURE – HUMAN WELL-BEING TARGET

Connection to nature refers to cultural and historical connection, educational connection, and spiritual connection. Interpretive and educational opportunities play an important role in the successful conservation of natural assets. Connecting people to nature can occur through educational signage, initiating programs, and conserving and celebrating cultural and historical connections to the land (e.g., Indigenous connections to the land).

##### *EDUCATION*

Education as a sub-target refers to educational opportunities for professionals, students, and visitors. Education is important as a sub-target to foster an understanding of the significance and complexities of the site. Education can be considered in the form of guided tours, educational signage, school-tours, and partnerships with local groups for research opportunities. This Target should build upon the current initiatives being undertaken, such as by The Saskatoon Nature Society, for example, who has been running bird banding and bat population monitoring programs for decades in the RSBBA (City of Saskatoon, 2020d). The site is popular with citizen science, with many species having been recorded in iNaturalist. Further programs, for adults and children alike, could be developed to foster education of the land, species, resource management, and importance of natural systems.

##### *CONNECTION TO NATURE*

Connection to nature, sense of place, and relationship to the land can be achieved in various ways. Responsible and low-impact passive recreation creates opportunities for humans to connect with nature and build a sense of place. Spending time in nature and interacting with the environment fosters a sense of belonging and responsibility for the land. Conserving natural spaces that are already cherished by residents, like the RSBBA, facilitates the overall connection to nature.

#### 5.2.1.6 RECREATION – HUMAN WELL-BEING TARGET

Natural assets such as RSBBA have the capacity to provide the infrastructure and unique natural setting for an assortment of active and passive recreation opportunities. Recreation, such as walking, hiking, biking, and bird watching offer both mental and physical stimulation which can improve fitness, alleviate stress, and boost overall health.

## PASSIVE RECREATION

The RSBBA currently supports a variety of passive recreational uses, such as, walking, birdwatching, and wildlife photography. This sub-target supports the continued use of the site as a destination for passive recreation and allows for visitors to enjoy the natural features of the site.

## ACTIVE RECREATION

The RSBBA currently supports a variety of active recreational uses, such as, all season biking, skills biking, off-leash dog exercise, and hiking. This sub-target supports the continued use of the site as a destination for active recreation while being respectful of the Conservation Targets.

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### 5.2.2 REFERENCE ECOSYSTEM

A reference ecosystem represents an undisturbed version of the ecosystem that is to be restored. The attributes and successional phase of the reference ecosystem is to be similar to the restoration project site (Gann et. al., 2019). As RSBBA is from non-native origin, it is challenging to find a suitable reference ecosystem. It would be inaccurate to use a native ecosystem site as a measure of restoration status for an anthropogenically created area. The RSBBA, therefore, could be compared to other urban parks in major cities (e.g., Regina). The reference ecosystem should exhibit the following features:

- Includes modified and unmodified forest types which show multiple successional stages/ structural diversity
- Is anthropogenically used for recreation and education
- Includes wetlands and/or other waterbodies
- Is located within City limits

During the conservation and restoration process of the RSBBA, the status of the selected urban park or other reference ecosystem should be consulted to create achievable objectives for the RSBBA over time. Conservation techniques that are deemed to be successful will be reviewed to facilitate with the restoration of the RSBBA. This process can be repeated until the RSBBA reaches ‘full recovery’. For the purposes of this NAMP, full recovery is achieved when the condition of the RSBBA and its key ecosystem attributes closely resembles the wetlands/waterbodies and forests in the selected reference ecosystem. Additional guidelines like Steward and Kantrud (1971) for the Wetland Conservation Target areas and McLaughlan, Wright and Jiricka (2010) for Forest Conservation Target areas may be used as guidance to understand a healthy status of a wetland and forest respectively.

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## 5.3 VIABILITY ASSESSMENT

To develop a sound CP, an understanding of the current biodiversity health of the site is required. Therefore, a Viability Assessment (VA) was conducted for each Conservation Target, using the Key Ecological Attributes (KEA) and their indicators as a measurement of health. The VA was informed by the available baseline information extracted from previous studies and reports relevant to the site (refer to Section 3 – Ecological Context for the summary and **Appendix C** for specific details). Where information was lacking, professional experience was applied.

For the purposes of this site-specific VA, the following steps were followed:

- Identify the Key Ecological Attributes (KEA) for each Conservation Target
- Establish indicators that can be applied to each KEA that are specific, measurable, precise, consistent, and achievable, and timely (i.e., actually responds to the attribute we are measuring)

- Use/develop an indicator rating system that can be used to rate and possibly rank each Conservation Target

### 5.3.1 KEA SELECTION AND INDICATOR RATINGS

A KEA is defined as a “structure, composition, interaction, or biotic and abiotic processes that enable the target to persist through influence on the target’s size, condition, and landscape context” (The Nature Conservancy, n.d.). It is a fundamental component of the target’s life history, habitat, community interaction, or physical processes (e.g., number of species of management concern, extent of invasive species). KEAs use three categories of ecological status that are used to assess biodiversity health: size, condition, and landscape context. According to the German Corporation for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ]; 2020):

- Size is “a measure of the area of the target’s occurrence or abundance of the target’s occurrence”
- Condition is “a measure of the biological composition, structure, and biotic interactions that characterize the space in which the target occurs”
- Landscape Context is “an assessment of the target’s environment, including ecological processes, regimes, and connectivity”

As KEAs cannot be directly measured, indicators are identified to determine the status of the KEA. An indicator is “a measurable entity that is used to assess the status and the trend of a KEA” (e.g., hectare, population size) (The Nature Conservancy, n.d.). Every KEA and its indicator will likely vary over time within a certain range. This variation is either natural and consistent with long-term trends, or outside of the natural range and due to human actions.

For the purposes of this VA, the indicator rating system applied has been adopted from The Nature Conservancy, (n.d.) which uses “the ranges of variation as an indicator that define and distinguish very good, good, fair, and poor rating categories to provide a consistent and objective basis for assessing the status of the indicator”. Depending on the KEA, each of these four ratings is associated with a different range. Refer to **Table 5-4** for details associated with the rating criteria used.

**Table 5-4: Rating Criteria<sup>(a)</sup>**

POOR	FAIR	GOOD	VERY GOOD
Allowing the indicator to remain in this condition for an extended period will make restoration or prevention of extirpation of the Conservation Target practically impossible.	The indicator lies outside of the range of acceptable variation and requires human intervention for maintenance. If unchecked, the Conservation Target will be vulnerable to serious degradation.	The indicator is functioning within the range of acceptable variation, although it may require some human intervention for maintenance.	The indicator is functioning within an ecologically desirable status, requiring little human intervention for maintenance within the natural range of variation (i.e., is as close to “natural” as possible and has little chance of being degraded by some random event).

Note:

a) Adapted from *The Nature Conservancy (n.d.)*

The three primary Conservation Targets have been assigned a list of applicable KEAs to assess the overall health of the target. **Table 5-5** details each KEA selected for each Conservation Target assessed.

**Table 5-5: KEAs by Conservation Target**

CONSERVATION TARGET	KEA	KEA DESCRIPTION
1.0 Forests	1.1 Spatial extent of naturalized forests identified	Change in spatial extent in hectares over time (currently measured at 86.0 ha of open canopy/ mixed woodland).
	1.2 Native flora species abundance and diversity	Change in spatial extent in hectares over time of the conservation sub-target remnant (native/naturalized) forest by decreasing afforested areas on site (refer to <b>Table 3-1</b> ) Decrease in invasive/undesirable species to enhance native flora is also targeted.
	1.3 Native fauna species abundance and diversity	Change in Shannon-Wiener Diversity Index (The Shannon-Wiener Diversity Index measures the diversity of species in a community. The higher the value, the higher the diversity of species in the community. A value of 0 indicates a community of only one species.) Currently, this value has not been calculated, as it requires species abundance as well as presence/absence indicators to determine.
	1.4 Woody species structural diversity	Change of numbers of structural layers present - Structural diversity in this context refers to the presence of multiple structural layers including herbaceous, seedlings, regeneration, pole, sapling, low shrub, medium shrub, tall shrub, mature trees, coarse woody debris, and down woody debris. Structural diversity is an indicator of health in a forest ecosystem as it increases available habitat and introduces new niches for a greater species composition and diversity.
2.0 Wetlands	2.1 Aerial extent of all wetlands identified	Change of hectares over time – No reduction in wetland habitat from the set pre-development wetland area.
	2.2 Water Quality	Change of CCME Water Quality Index over time (The CCME water quality index provides the possibility to evaluate complex water quality data. The formula is based on three main components: scope (number of variables not meeting water quality objectives), frequency (number of times these objectives are not met), and amplitude (amount by which objectives are not met).
	2.3 Function of catchment areas	Change of functional catchment areas and hydrological connections over time, which may result in sustained flooding beyond normal conditions, or drought conditions.
	2.4 Native fauna species abundance and diversity	Change in Shannon-Wiener Diversity Index (The Shannon-Wiener Diversity Index measures the diversity of species in a community. The higher the value, the higher the diversity of species in the community. A value of 0 indicates a community of only one species.) Currently, this value has not been calculated, as it requires species abundance as well as presence/absence indicators to determine.
3.0 SOMC	3.1 SOMC and Culturally Significant Species abundance and diversity	Change in the number of possible confirmed SOMC on site (starting out with seven species of which five are wildlife species and two are plant species) and spatial extent. Refer to 1.2 and 1.3.
	3.2 Individual SOMC	Change of number of individuals per species and spatial extent (ha).

**Table 5-6: Indicator Ratings Table- Forests**

CATEGORY	KEY ECOLOGICAL ATTRIBUTE	INDICATOR	INDICATOR RATINGS <sup>(A)</sup>			
			POOR	FAIR	GOOD	VERY GOOD
Size	1.1 Spatial extent of all forested areas identified.	Hectare (86 ha of open canopy/ mixed woodland).	More than 10% reduction (8.6 ha) in the total forested area	5-9% reduction (4.3 – 7.7 ha) in the total forested area	No more than 5% (4.3%) reduction of the forested area.	No reduction in forested habitat.
Condition	1.2 Native flora species abundance and diversity.	Population extent (hectares).	Population extent not determined or unknown.	Statistically significant loss of population extent.	<i>Stable population.</i>	Statistically significant increase of population extent.
	1.3 Native fauna species abundance and diversity.	Shannon-Wiener Diversity Index <sup>(b)</sup> .	Shannon-wiener Diversity Index of 2.0 and below.	Shannon-wiener Diversity Index of 2.5 - 2.99.	<i>Shannon-wiener Diversity Index of 3.0 - 3.49.</i>	Shannon-wiener Diversity Index of 3.5 and above.
	1.4 Woody species structural diversity.	Number of structural layers present.	Evenly structured with no vertical diversity.	Simple community structure with one to two structural layers.	Structural layers are present as compared to applicable reference habitat.	<i>Forest structure is reminiscent of a native and unmanaged forest in the area.</i>

Note:

- a) Preferred or desired rating is presented in italics, current rating is presented in colour.
- b) Current rating is unknown.

**Table 5-7: Indicator Ratings Table- Wetlands**

CATEGORY	KEY ECOLOGICAL ATTRIBUTE	INDICATOR	INDICATOR RATINGS <sup>(a)</sup>			
			POOR	FAIR	GOOD	VERY GOOD
Size	2.1 Total Wetland Size.	Spatial extent of set pre-development wetlands in hectares (23.4 ha of wetlands).	More than 20% reduction of the set pre-development wetland area.	19-11% (or 2.6-4.4 ha) reduction of set pre-development wetland area.	No more than 5-12% (or 1.2-2.8) reduction in the set pre-development wetland area.	<i>No reduction in wetland habitat from the selected pre-development extent.</i>
Condition	2.2 Water quality.	CCME Water Quality Index <sup>(b)</sup> .	CCME WQI Value 0-64 – water quality is frequently threatened or impaired; conditions often depart from natural or desirable levels.	CCME WQI Value 65-79 – water quality is usually protected but occasionally threatened or impaired; conditions sometimes depart from natural or desirable levels.	<i>CCME WQI Value 80-94 – water quality is protected with only a minor degree of threat or impairment; conditions rarely depart from natural or desirable levels .</i>	CCME WQI Value 95-100 – water quality is protected with a virtual absence of threat or impairment, conditions very close to natural or pristine levels.
	2.3 Function of catchment areas as a function of average annual runoff.	Accessible functional catchment areas. Maintenance of catchment areas from pre-development.	More than 20% change from the set pre-development average annual runoff.	19-11% change from the set pre-development average annual runoff.	Less than 5-12% change from the set pre-development average annual runoff.	<i>Maintain set pre-development average annual runoff and natural hydroperiod.</i>
	2.4 Native fauna species abundance and diversity.	Shannon-wiener Diversity Index <sup>(b)</sup> .	Shannon-wiener Diversity Index of 2.0 and below.	Shannon-wiener Diversity Index of 2.5 -2.99.	<i>Shannon-wiener Diversity Index of 3.0 -3.49.</i>	Shannon-wiener Diversity Index of 3.5 and above.

Note:

a) Preferred or desired rating is presented in italics, current rating is presented in colour.

b) Current rating is unknown.

**Table 5-8: Indicator Ratings Table – Species of Management Concern**

CATEGORY	KEY ECOLOGICAL ATTRIBUTE	INDICATOR	INDICATOR RATINGS <sup>1</sup>			
			POOR	FAIR	GOOD	VERY GOOD
Condition	3.1 SOMC diversity.	Quantity of confirmed SOMC on site (seven species – five wildlife and two plants).	More than half of SOMC lost.	Decreased quantity of SOMC across the site.	Stable (seven species – five wildlife and two plants).	<i>Increase in SOMC detection.</i>
	3.2 Individual SOMC.	Number of individuals per species and spatial extent.	Species no longer detected on site over time.	Statistically significant decline in population and spatial extent from baseline report.	No statistically significant change in population and spatial extent from baseline report.	<i>Statistically significant increase in population and spatial extent from baseline report.</i>

Note:

a) Preferred or desired rating is presented in italics, current rating is presented in colour.

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### 5.3.2 VIABILITY ASSESSMENT SUMMARY

The ecological status of each Conservation Target was rated by evaluating up to three categories, including condition, landscape context, and size on the rating criteria scale detailed in Section 5.2.1 – Conservation and Human Well-Being Targets. An average of these ratings across the categories was then used to determine the overall status or viability of the applicable Conservation Target.

To assess the categories for each Conservation Target, at least one KEA for each category was utilized. Refer to **Tables 5-6, Table 5-7, and Table 5-8** for a detailed summary of each KEA and the indicator to measure change. The final VA rating for each Conservation Target is listed below.

All Conservation Targets are assessed as of November 2023 and are to be reassessed in 2033.

The overall rating for the Forests Conservation Target is **fair**.

The overall rating for Wetland Conservation Target is **fair**.

The overall rating for Species of Management Concern is **good**.

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### 5.3.3 RESTORATION FEASIBILITY

There is potential for restoration and reclamation activities on site, to enhance the ecological and human wellbeing conservation targets identified in Section 5.2.1 – Conservation and Human Well-Being Targets. The Conceptual Plan written by WSP in 2023 outlines a monitoring framework in detail. A summary is presented in **Figure 5-1**.



**Figure 5-1: Summary of Restoration or Reclamation Framework**

The Ecological Recovery Wheel (ERW) is a tool developed by the Society for Ecological Restoration (SER). It is designed to guide and track the progress of ecological restoration projects. The ERW provides a structured way to assess the stages of recovery in an ecosystem. It is designed as a visual framework to emphasize that ecological restoration is a dynamic and always-changing process that requires consideration of multiple environmental and anthropogenic factors. The ERW presents six attributes with three sub-attributes each to rank the subsections on a five-star scale, where five stars represent an ecosystem being fully recovered.

The information collected from the baseline data collection should be input into the relative sub-attribute table for the Ecological Recovery Wheel which have been defined in the International Principles and Standards for the Practice of Ecological Restoration (Gann et al., 2019).

As detailed baseline data is required to use the ERW, only estimates about two pre-selected locations were made. The areas are used to demonstrate how the ERW would function once sufficient baseline data is collected. For sub-attributes that were not able to be assessed, they were given a score of zero and under the evidence for recovery column it was indicated with “Cannot be assessed at this point”.

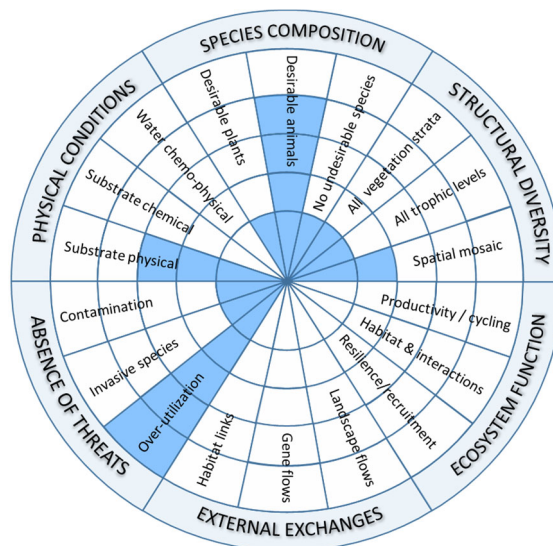


- **Location 1:** Forest Health Assessment Plot 5 and Plot 6, located within the afforested area in the southern portion of SE 23-36-06 W3M. It was assessed during the Blairmore Natural Area Screening Report by EDI in 2022. This location was selected because of the level of detail available, and its suitability as a restoration location
- **Location 2:** Large central Wetland. This location was selected because of the level of detail available, and its suitability as a restoration location

The ERW is comprised of six key ecosystem attributes (with three sub-attributes each) that, when ranking high, contribute to ecosystem integrity. These six attributes are used to describe the reference ecosystem, evaluate the baseline conditions to be restored, set restoration project goals, and monitor the recovery of the restoration site. Further definitions of the sub-attributes as well as ecological recovery scale are described in the Conceptual Plan (WSP, 2023). **Figure 5-2** and **Table 5-9** show the current estimated status of Location 1 (including recovery level). **Table 50** and **Figure 5-3** describe the same for the Large Central Wetland. A level of the highest possible recovery cannot be stated at this point as an appropriate level of detailed baseline data is still required.

### 5.3.3.1 ERW LOCATION 1

Location 1 has eight sub-attributes that were not able to be assessed at this time, and best estimates were made using the data collected by EDI for the Blairmore Natural Areas Screening Report (2022).



**Figure 5-2: Ecological Recovery Wheel Scores for Location 1**

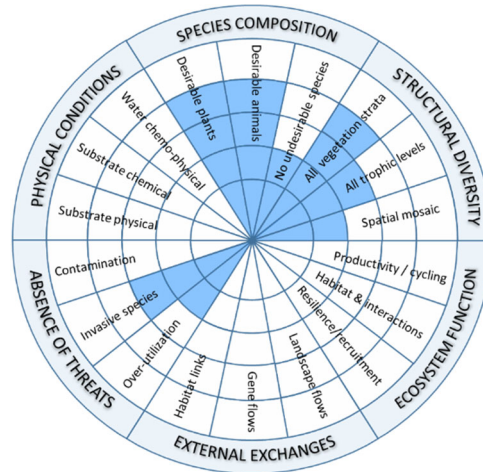
The wheel represents the estimated current status of the sub-attributes and coincides with the Forest Health Assessment score of “Unhealthy” for this location.

**Table 5-9: Baseline Condition Scoring for Location 1**

ATTRIBUTE CATEGORY	BASELINE RECOVERY LEVEL (1-5)	EVIDENCE FOR RECOVERY LEVEL
<b>ATTRIBUTE 1. ABSENCE OF THREATS</b>		
Over-utilization	5	No exploitation or harvesting of resources is occurring at this location.
Invasive species (external)	1	A high number of invasive, noxious, and nuisance species are present including Canada thistle, common caragana, and absinth. There is also the potential of eight other invasive species being in close vicinity to this location.
Contamination	1	The site shows high numbers of invasive, noxious, and nuisance species.
<b>ATTRIBUTE 2. PHYSICAL CONDITIONS</b>		
Substrate physical	3	This is the best estimate given the existing species composition.
Substrate chemical	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 in <b>Appendix C</b> .
Water chemo-physical	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #9 action item 2 in <b>Appendix C</b> and the Water Quality KEA.
<b>ATTRIBUTE 3. SPECIES COMPOSITION</b>		
Desirable plants	1	Mostly invasive, noxious, and nuisance species present at this location, but two provincially listed flora species red elderberry and yellow lady's slipper have been observed in the associated vegetation community (EDI 2022).
Desirable animals	4	A 'threatened' species, common nighthawk was detected in the vicinity of this location. Up to 12 bird species and 10 mammals are present.
No undesirable species	1	Mostly afforested species observed at this location including European buckthorn, Siberian elm, and blue spruce. The presence of invasive species like smooth brome, Canada thistle, and common caragana was also recorded.
<b>ATTRIBUTE 4. STRUCTURAL DIVERSITY</b>		
All strata present	1	At this location, multiple forest vegetative layers are missing (i.e., tall shrub, mid shrub, short herb layer).
All trophic levels	1	Due to the lack of vegetative layers, it is likely that trophic layers are missing as well.
Spatial mosaic	2	As vegetative strata are missing, the spatial patterning is noncomplex.
<b>ATTRIBUTE 5. ECOSYSTEM FUNCTION</b>		
Productivity, cycling etc	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #6 Action Item 2 in <b>Appendix C</b> .
Habitat interactions	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
Resilience, recruitment etc	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
<b>ATTRIBUTE 6. EXTERNAL EXCHANGES</b>		
Landscape flows	0	Cannot be assessed at this point. There is some indication that linkages exist but the scale and effect on local species is unknown. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
Gene flows	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
Habitat links	0	Cannot be assessed at this point. There is some indication that linkages exist but the scale and effect on local species is unknown. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .

## ERW LOCATION 2

Location 2 has ten sub-attributes that were not able to be assessed at this time, and best estimates were made using available data.



**Figure 5-3: Ecological Recovery Wheel Scores for Location 2**

The resulting wheel shows the potential areas and attributes for improvement in the future.

**Table 5-1-10: Baseline Condition Scoring for Location 2**

ATTRIBUTE CATEGORY	RECOVERY LEVEL (1-5)	EVIDENCE FOR RECOVERY LEVEL
ATTRIBUTE 1. ABSENCE OF THREATS		
Over-utilization	2	Frequent pedestrian traffic on the wetland margins can cause similar impacts as over-utilization.
Invasive species (external)	3	Invasive, noxious, and nuisance species are present including Canada thistle and perennial sow-thistle. There is the potential of 13 other invasive species being in close vicinity.
Contamination	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 in <b>Appendix C</b> and the Water Quality KEA.
ATTRIBUTE 2. PHYSICAL CONDITIONS		
Substrate physical	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 in <b>Appendix C</b> .
Substrate chemical	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 in <b>Appendix C</b> .
Water chemo-physical	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #9 action item 2 in <b>Appendix C</b> and the Water Quality KEA.
ATTRIBUTE 3. SPECIES COMPOSITION		
Desirable plants	4	There is an abundance of native species present including common cattail, hard stem bulrush, and three-square bulrush.
Desirable animals	4	There were 16 birds and 8 mammals observed interacting with this wetland (EDI, 2022).
No undesirable species	2	The wetland has been invaded by Canada thistle and perennial sow-thistle. There is potential for other weedy species to be present.

ATTRIBUTE CATEGORY	RECOVERY LEVEL (1-5)	EVIDENCE FOR RECOVERY LEVEL
<b>ATTRIBUTE 4. STRUCTURAL DIVERSITY</b>		
All strata present	4	Most strata are present but nonnative graminoids are replacing species in some areas.
All trophic levels	3	Based on vegetative species composition, the trophic complexity is likely high.
Spatial mosaic	2	The wet meadow zone of the wetland is highly restricted.
<b>ATTRIBUTE 5. ECOSYSTEM FUNCTION</b>		
Productivity, cycling etc	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #6 Action Item 2 in <b>Appendix C</b> .
Habitat interactions	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
Resilience, recruitment etc	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
<b>ATTRIBUTE 6. EXTERNAL EXCHANGES</b>		
Landscape flows	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
Gene flows	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .
Habitat links	0	Cannot be assessed at this point. Refer to Strategy #1 Action item 2 and Strategy #10 Action Item 2 in <b>Appendix C</b> .

## 5.4 THREAT ASSESSMENT

To understand the negative forces acting on the Conservation Targets and the KEA, **Direct Threats** and **Stresses** were identified and then assessed. Direct Threats, both **Conventional Threats** and **Climate Threats** were first identified in conjunction with a Climate Change Vulnerability Assessment (CCVA). Once threats were established, Stresses were then identified to show the biophysical linkages between the Direct Threats and the Conservation Targets.

The aim of this step is to have a thorough understanding of the direct pressures on the applicable KEAs associated with each of the Conservation Targets to develop appropriate mitigation paths to achieve future improvement or enhancements that move the indicator ratings towards the desired status.

### 5.4.1 CONVENTIONAL THREATS

A Conventional Threat is “a human action that directly degrades one or more Conservation Targets” (CMP, 2020). Conventional Threats were first identified during the stakeholder engagement process and refined to reflect the greatest pressures on the site. For a list of the identified Conventional Threats refer to **Table 5-11**.

### 5.4.2 CLIMATE THREATS

For the purposes of this threat assessment, Climate Threat is defined as “observed and expected changes in climate that degrade one or more conservation targets or exacerbate existing conventional threats” (GIZ, 2020).

To identify Climate Threats, an understanding of the vulnerability of the site to climatic changes is required. In this context, climate vulnerability refers to the degree to which an ecological system, habitat, or individual species is likely to experience harm as a result of changes in climate (GIZ, 2020). To explore climate as a threat, the Conservation Standards, uses a CCVA as a tool to assess how climate change is likely to impact the identified Conservation Targets (GIZ, 2020). Therefore, a CCVA was conducted by analyzing the projections from a selected climate model for the City of Saskatoon and surrounding area. Climate Threats were then itemized and assessed based on the capacity of the threat to degrade the KEA of the Conservation Targets. For a list of the identified Climate Threats refer to **Table 5-11**.

### CLIMATE CHANGE VULNERABILITY ASSESSMENT

The CCVA completed for this site was undertaken through the following process:

- 1 A climate model was selected as a base for projections.
  - a The Climate Atlas Report was used to inform the assumed projections and climate change data for Saskatoon (Climate Atlas, 2023).
- 2 Climate variables were then identified to assess the relationship between the climate and the health of the Conservation Targets.
  - a Using the High Carbon Future (RCP 8.5) as a baseline, it is anticipated that Saskatoon will in general be subject to more frequent and severe storms, an increase in average temperatures, more frequent hot days, and drought (see **Figure 5-4**).
- 3 Once Steps 1 and 2 were completed, climate impacts, or Climate Threats which impact the Conservation Targets were identified and ranked.
  - a As such, three Climate Threats were selected which represent these climactic changes and pressures on the Conservation Targets.
- 4 The final step completed was linking the Climate Threats and associated Stresses to the Conservation Targets in the Situation Model completed for the site.

Variable	Period	1976-2005	2021-2050			2051-2080		
		Mean	Low	Mean	High	Low	Mean	High
Precipitation (mm)	annual	351	265	377	500	270	392	525
Precipitation (mm)	spring	78	41	88	146	48	99	162
Precipitation (mm)	summer	158	87	162	257	80	160	254
Precipitation (mm)	fall	65	33	73	123	34	75	132
Precipitation (mm)	winter	50	32	54	79	34	58	86
Mean Temperature (°C)	annual	2.7	3.2	4.9	6.6	5.1	7.2	9.3
Mean Temperature (°C)	spring	3.1	2.1	5.2	8.4	3.9	7.2	10.6
Mean Temperature (°C)	summer	17.6	17.8	19.7	21.6	19.5	22	24.3
Mean Temperature (°C)	fall	3.9	3.5	5.9	8.1	5.9	8.2	10.5
Mean Temperature (°C)	winter	-14.3	-15.8	-11.7	-7.7	-13	-8.8	-4.7
Tropical Nights	annual	0	0	2	6	1	9	23
Very hot days (+30°C)	annual	14	10	28	47	21	47	72
Very cold days (-30°C)	annual	14	0	6	16	0	2	7
Date of Last Spring Frost	annual	May 12	April 17	May 4	May 19	April 6	April 28	May 14
Date of First Fall Frost	annual	Sep. 23	Sep. 17	Oct. 2	Oct. 18	Sep. 21	Oct. 10	Oct. 29
Frost-Free Season (days)	annual	130	125	147	171	134	162	192

**Figure 5-4: Climate Projection for Saskatoon**

### 5.4.3 STRESSES

A Stress is an attribute of a Conservation Target’s ecology that is impaired directly or indirectly by human activities or climate threats (CMP, 2020). Following the identification of the Direct Threats (Conventional and Climate Threats), Stresses, or biophysical attributes, were identified and linkages made between the Direct Threat and the Targets. These linkages represent the ways in which the Stresses impact the Conservation Targets. For instance, the Introduction of Invasive or Undesirable Species (Direct Threat) leads to competition for, and decline in, resources for native species (Stress), which thereby places pressure on the KEA of a Target, such as that for the Forests. Refer to **Table 5-11** for a complete list of the identified Stresses.

### 5.4.4 SUMMARY OF DIRECT THREATS & STRESSES

A summary of the Direct Threats (Conventional Threats and Climate Threats) and the associated Stresses has been compiled in **Table 5-11**. The summary provides a list of the elements nested within each of the named Direct Threats, as well as a list of the identified Stresses. For a visual on the linkages between the Direct Threats, Stresses and Targets, refer to the Section 5.6.6 – Action Plan Summary.

**Table 5-11: Direct Threats (Conventional Threat & Climate Threat) and Stresses**

THREAT	THREAT INCLUDES	JUSTIFICATION FOR INCLUSION OF THREAT	STRESSES
Introduction of Invasive & Undesirable Species (Conventional Threat)	<ul style="list-style-type: none"> <li>– Introduction of provincially prohibited, noxious, and nuisance species</li> <li>– Introduction of undesirable species</li> <li>– Introduction of pests, diseases, and invasive wildlife species, such as wild boar</li> </ul>	<ul style="list-style-type: none"> <li>– Based on available information, 16 noxious and nuisance weed species have been identified on site that can have ecological, economic, and social impacts including outcompeting native species, disrupting local ecosystem, and cause ecological imbalances</li> </ul>	<ul style="list-style-type: none"> <li>– Competition for, and decline in, resources for both flora and fauna</li> <li>– Change to hydrological systems, water levels, water quality, and physical structure</li> <li>– Decline in vegetation community structure/species composition, genetic diversity, size, and distribution</li> </ul>
Incompatible external land use (Conventional Threat)	<ul style="list-style-type: none"> <li>– Transportation routes, such as Township Road 362A, Highway 7, Range Road 3063, Valley Road</li> <li>– CN Rail line and CN Railway Rail Yard Management site</li> <li>– Cedar Villa Estates</li> <li>– Snow storage area located near the Civic grounds</li> </ul>	<ul style="list-style-type: none"> <li>– Current or future land use changes proposed in proximity to the site that are undertaken in isolation without appropriate baseline biophysical understanding could lead to site isolation, impacting wildlife connectivity</li> </ul>	<ul style="list-style-type: none"> <li>– Increased barriers and fragmentation of habitats</li> <li>– Increase in pollution, light, sound, sedimentation, and fertilizers</li> </ul>
Incompatible Human Use of Site (Conventional Threat)	<ul style="list-style-type: none"> <li>– Existing illegal uses, such as dumping, hunting, snowmobiles, other vehicular use, and fires</li> <li>– Off-leash dogs outside of designated areas</li> <li>– Irresponsible recreational uses.</li> <li>– Competing recreational uses of the site</li> </ul>	<ul style="list-style-type: none"> <li>– Incompatible human uses contribute to fragmentation and ecosystem degradation of the site</li> </ul>	<ul style="list-style-type: none"> <li>– Increase/decline in predators (i.e., domestic pets), pests, and diseases</li> <li>– Increased human pressure on site (i.e., quantity of people with direct access to site)</li> <li>– Increased impermeable surfaces and structures</li> </ul>
Suppression of natural disturbance regimes (Conventional Threat)	<ul style="list-style-type: none"> <li>– Suppression of fire, grazing, and flooding</li> </ul>	<ul style="list-style-type: none"> <li>– The suppression of natural disturbances leads to community simplification</li> <li>– Possible extreme and more intense uncontrolled/unplanned disturbed due to elevated fuel loading</li> </ul>	<ul style="list-style-type: none"> <li>– Change to topography</li> <li>– Wildlife conflict with humans (vehicular and other)</li> <li>– Die-offs from heat and desiccation stress</li> <li>– Increasing evaporation</li> </ul>

THREAT	THREAT INCLUDES	JUSTIFICATION FOR INCLUSION OF THREAT	STRESSES
Fragmentation & Barriers (Conventional Threat)	<ul style="list-style-type: none"> <li>— Impermeable barriers, such as fences and walls</li> <li>— High-risk barriers, such as transportation routes and development</li> <li>— Long-distances or broken connections between natural areas and habitats (on and off-site)</li> </ul>	<ul style="list-style-type: none"> <li>— Current or future land use changes proposed within (e.g., trail construction) or in proximity to the site that are undertaken in isolation without appropriate baseline biophysical understanding could lead to wildlife connectivity impacts and a reduction in faunal species richness observed</li> </ul>	<ul style="list-style-type: none"> <li>— Change in temperature, precipitation, and seasonal patterns.</li> </ul>
Water Management (Conventional Threat)	<ul style="list-style-type: none"> <li>— Negative alterations to physical structure of water bodies and watercourses, riparian edges, and water treatment, hydrological inputs, or conveyance of inputs</li> </ul>	<ul style="list-style-type: none"> <li>— Improper water management (e.g., artificial flooding/ drought) will lead to negative waterbody impacts</li> </ul>	
Frequency and Severity of Storms & Natural Disasters (Climate Threat)	<ul style="list-style-type: none"> <li>— Flooding, wildfires, snowstorms, and hail</li> </ul>	<ul style="list-style-type: none"> <li>— Climate threats need to be considered in every plan as it is inevitable that some form of climate change will be experienced</li> </ul>	
Increasing Average Temperatures & Drought (Climate Threat)	<ul style="list-style-type: none"> <li>— Increase in the mean average temperatures</li> </ul>		
Change to precipitation (Climate Threat)	<ul style="list-style-type: none"> <li>— Frequency and severity of droughts</li> </ul>		

#### 5.4.5 DIRECT THREATS ASSESSMENT CRITERIA

Threats were assessed and ranked based on the following Direct Threat Assessment Criteria as defined by the Conservation Standards (CMP, 2020):

- **Scope** - Proportion of the Conservation Target that can reasonably be expected to be affected by the threat within ten years given the continuation of current circumstances and trends. For ecosystems and ecological communities, scope is measured as the proportion of the target’s occurrence. For species, scope is measured as the proportion of the target’s population
- **Severity** - Within the scope, the level of damage to the target from the threat that can be reasonably expected given the continuation of current circumstances and trends. For ecosystems and ecological communities, severity is typically measured as the degree of destruction or degradation of the target within the scope. For species, severity is usually measured as the degree of reduction of the target population within the scope (CMP, 2020)
- **Irreversibility** - The degree to which the effects of a threat can be reversed, and the target affected by the threat restored (CMP, 2020)

A ranking of either Low, Medium, High, or Very High was applied to understand the impact of the Direct Threats on the Conservation Targets. See below (**Table 5-12**) for a detailed description of the criteria used to assess and subsequently rank the Direct Threats.

**Table 5-12: Direct Threats Assessment Criteria**

CRITERIA	RANK	CRITERIA
Scope	Low	The threat is likely to be very narrow in its scope, affecting the target across a small proportion (1%-10%) of its occurrence/population.
	Medium	The threat is likely to be restricted in its scope, affecting the target across some (11%-30%) of its occurrence/population.
	High	The threat is likely to be widespread in its scope, affecting the target across much (31%-70%) of its occurrence/population.
	Very High	The threat is likely to be pervasive in its scope, affecting the target across all or most (71%-100%) of its occurrence/population.
Severity	Low	Within the scope, the threat is likely to slightly degrade/reduce the target or reduce its population by 1%-10% within ten years or three generations.
	Medium	Within the scope, the threat is likely to moderately degrade/reduce the target or reduce its population by 11%-30% within ten years or three generation.
	High	Within the scope, the threat is likely to seriously degrade/reduce the target or reduce its population by 31%-70% within ten years or three generations.
	Very High	Within the scope, the threat is likely to destroy or eliminate the target or reduce its population by 71%-100% within ten years or three generations.
Irreversibility	Low	The effects of the threat are easily reversible, and the target can be easily restored at a relatively low cost and/or within 0-5 years (e.g., off-road vehicles trespassing in wetland).
	Medium	The effects of the threat can be reversed, and the target restored within a reasonable commitment of resources and/or within 6-20 years (e.g., ditching and draining of wetland).
	High	The effects of the threat can technically be reversed, and the target restored, but it is not practically affordable and/or it would take 21-100 years to achieve this (e.g., wetland converted to agriculture).
	Very High	The effects of the threat cannot be reversed, and it is very unlikely the target can be restored, and/or it would take more than 100 years to achieve this (e.g., wetlands converted to shopping center).

#### 5.4.6 DIRECT THREATS ASSESSMENT SUMMARY

Using the Miradi software, a summary threat ranking was produced based on the rankings of each Direct Threat across each of the Targets as part of the Threat Assessment. **Table 5-13** below provides a summary of the ranking of each Direct Threat. These rankings have influence on the priority of the Actions in Section 5.6 - Action Plan.



**Table 5-13: Threat Analysis Matrix**

DIRECT THREAT (CONVENTIONAL AND CLIMATE THREAT)	CONSERVATION TARGET			SUMMARY THREAT RANKING
	FORESTS	WETLANDS	SOMC	
Introduction of Invasive & Undesirable Species (Conventional Threat)	High	High	High	High
Incompatible external land use (Conventional Threat)	Very High	Very High	High	Very High
Incompatible Human Use of Site (Conventional Threat)	High	Medium	Medium	Medium
Suppression of natural disturbance regimes (Conventional Threat)	High	High	Very High	High
Fragmentation & Barriers (Conventional Threat)	Medium	Medium	High	Medium
Water Management (Conventional Threat)	Low	Medium	High	Medium
Frequency and Severity of Storms & Natural Disasters (Climate Threat)	High	High	High	High
Increasing Average Temperatures & Drought (Climate Threat)	High	Very High	High	High
Change to precipitation (Climate Threat)	High	High	High	High
Summary Target Ratings	Very High	Very High	Very High	Very High

## 5.5 SITUATION ANALYSIS

To gain a full understanding of the forces acting upon the Conservation Targets and Direct Threats, a Situation Analysis was conducted. As part of the CP, the Situation Analysis brings together the information gathered in the previous steps (i.e., Targets, Threats, and Stresses) to create a common understanding of the project’s context. This includes the biological environment, the social, economic, political, and institutional systems that affect the ecosystems, species, and human well-being targets (GIZ, 2020).

### 5.5.1 CONTRIBUTING FACTORS (INDIRECT THREATS & OPPORTUNITIES)

Contributing Factors were identified for each of the Conventional Threats. Contributing Factors drive Conventional Threats and are composed of both Indirect Threats and Opportunities relevant to the project’s context (GIZ, 2020). Refer to the Situation Model (**Figure 5-5**) for a full account of all identified contributing factors.

**Contributing factor:** An Indirect Threat, Opportunity, or other important variable that positively or negatively influences Conventional Threats.

- **Indirect threat:** A factor identified in a situation analysis that is a driver of a conventional threat and is often an entry point for conservation Actions
  - **Opportunity:** A contributing factor that could have a positive effect on a conservation target, directly or indirectly, and is often an entry point for conservation Actions
- 

### **5.5.2 SITUATION MODEL**

A situation model is a visual diagram summarizing the NAMP team’s understanding of the project’s context – including describing the relationships among the biological environment and the social, economic, political, and institutional systems and associated stakeholders that affect the conservation targets desired to be conserved.

The situation model developed for the RSBBA (Figure 5-5) contains the following elements: Project scope, Conservation targets, Human Well-Being targets, Stresses, Conventional Threats, Climate Threats, and Contributing Factors (Indirect Threats & Opportunities).

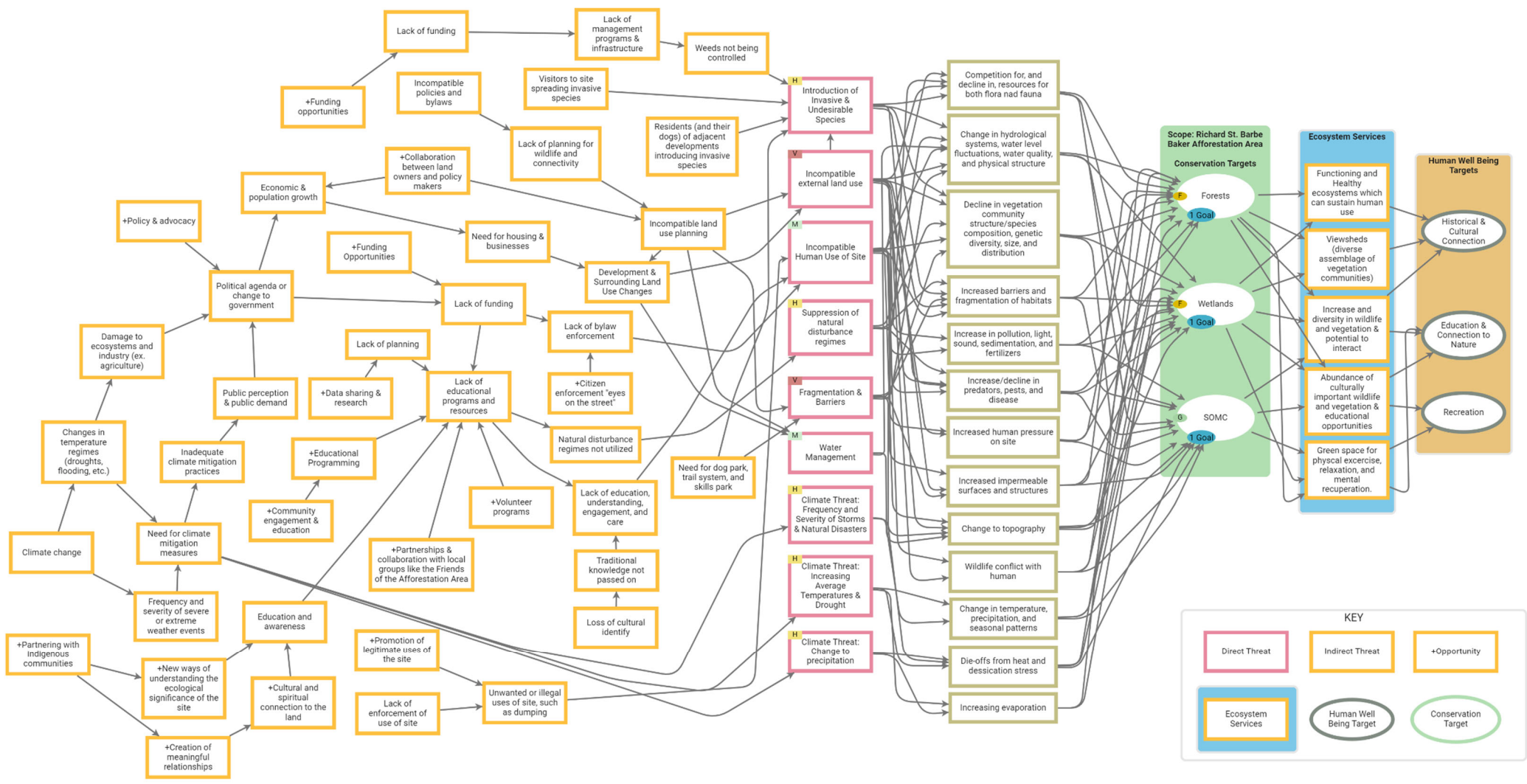


Figure 5-5: Situation Model

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## 5.6 ACTION PLAN

An Action Plan, as defined by the Open Standards for the Practice of Conservation (Conservation Standards; CMP, 2020) is “a description of a project’s Goals and Objectives and the Strategies that will be undertaken to abate identified Threats and make use of Opportunities” (CMP, 2020). The Action Plan is one part of the three-part Strategic Plan (i.e., Action Plan, Monitoring Plan, and Operational Plan) defined by the Conservation Standards for the successful management of a site. The remaining two parts of the Strategic Plan (Monitoring Plan and Operational Plan) are addressed in subsequent sections of this NAMP.

The Action Plan builds upon the Targets and Threats addressed in the previous sections of the Conservation Plan, following the following steps with the aim of producing a final Action Plan:

- 1 Goals.
- 2 Strategies.
- 3 Results Chains.
- 4 Actions.
- 5 Objectives.
- 6 Final Action Plan.

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### 5.6.1 STEP ONE: GOALS

In the context of the Conservation Standards, a Goal is linked to the Conservation Targets and represent the desired status of those Targets over the long-term (CMP, 2020). An effective goal should conform to the SMART criteria, meaning that it should be specific, measurable, achievable, results-oriented, and time-limited. Goals were developed for each Conservation Target and are intended to be a measurable summary of the future desired status of the Indicators for each Conservation Target. As an additional step, goals were also developed for each Human Well-Being Target to ensure all aspects of the Targets were achieved. Refer to Section 5.6.6 – Action Plan Summary for a summary of the Goals identified for each Target.

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### 5.6.2 STEP TWO: STRATEGIES

Strategies are defined as a set of activities or Actions with a common focus that work together to achieve specific Goals and Objectives by targeting key intervention points, optimizing opportunities, and limiting constraints (CMP, 2020). An effective strategy meets the criteria of being linked, focused, feasible, and appropriate (CMP, 2020).

Eleven Strategies were identified for the NAMP based on the potential of each Strategy to abate both the Direct Threats and Indirect Threats and make use of the Opportunities. Once identified, each Strategy was assessed and ranked based on the Potential Impact of the Strategy on the Goals, and the Feasibility to implement the Strategy. See below for a summary of the assessment of the Strategies.

#### STRATEGY ASSESSMENT

Strategies were assessed and ranked based on the following Strategies Criteria (**Table 5-14**) as defined by the Conservation Standards (CMP, 2020):

- Potential Impact: The confidence of the NAMP team that the strategy will achieve its desired Goals and/or Objectives
- Feasibility: The assumed ability of the City of Saskatoon, and potential partners, to implement the strategy within likely time, financial, staffing, ethical, and other constraints

Each criterion was then ranked using a qualitative indicator of either Not Effective, Need More Information, Effective, or Very Effective. Refer to **Table 5-14** for summary of the Strategy Assessment Criteria used.

**Table 5-14: Strategy Assessment Criteria**

CRITERIA	RANK	CRITERIA
Potential Impact	Low	The strategy is unlikely to meaningfully contribute to project goals and/or objectives.
	Medium	The strategy could meaningfully contribute to project goals and/or objectives but would need pilot-testing to ensure it is effective under this project's conditions.
	High	The strategy is likely to meaningfully contribute to project goals and/or objectives but would need effectiveness monitoring to ensure it is effective under this project's conditions.
	Very High	The strategy is likely to meaningfully contribute to one or more project goals and/or objectives and can be implemented at scale with only implementation monitoring.
Feasibility	Low	The strategy is not ethically, technically, or financially feasible.
	Medium	The strategy is ethically feasible, but either technically or financially difficult without substantial additional resources.
	High	The strategy is ethically and technically feasible but may require some additional financial resource.
	Very High	The strategy is ethically, technically, and financially feasible.

**Final Strategy Ranking:** The final rating for each Strategy was produced in Miradi based on the ratings of each Strategy for Potential Impact and Feasibility. See **Table 5-15** below for a summary of the Strategy Ratings. The results of the assessment were used to guide the NAMP team when considering which Strategies should be prioritized for implementation to abate the Threats and make use of the Opportunities.

Note: The “Baseline Collection & Data Management” Strategy has been ranked as “Not Effective” as data collection alone does not have the ability to reduce a direct threat. This ranking should not be confused for the importance of this strategy. Data collection is a critical step in each Strategy as demonstrated in Section 5.6.6 – Action Plan Summary.

**Table 5-15: Strategy Rating**

STRATEGY	POTENTIAL IMPACT	FEASIBILITY	STRATEGY RATING
Baseline Collection & Data Management	Low	Medium	Not Effective
Policy, Enforcement, and Urban Planning	High	High	Effective
Buffering of Adjacent Lands	High	High	Effective
Enhancements & Improvements	High	High	Effective
Invasive & Undesirable Species Management	High	High	Effective
Natural Disturbance Regime Management	High	High	Effective
SOMC (Flora & Fauna) Management	High	High	Effective
Historically and Culturally Significant Species & Features Management	High	High	Effective
Water Management	High	High	Effective
Ecological Connectivity Management	High	High	Effective
Human Use Programming	High	High	Effective

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### 5.6.3 STEP THREE: RESULTS CHAINS

A **Results Chain** for each Strategy was developed to depict the theory of change, or **Assumptions** of how each Strategy will assist with the achievement of each Goal. A Results Chain is a tool which depicts these Assumptions in a casual (“if then”) progression of results which represent how the NAMP team believes the activities will lead to a long-term result (CMP, 2020). The Situation Model was used as the basis for developing the Results Chain to show how the Strategy will affect the current state of the Targets. The Results Chains underwent multiple refinements with the final Results depicted for each Strategy in Section 5.6.6 – Action Plan Summary.

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### 5.6.4 STEP FOUR: ACTIONS

Each Strategy is a combination of multiple Actions. These Actions are measurable tasks which are intended to be completed in order of the priority assigned to the Action. The Actions consider the following 9 categories so that each Strategy represents a complete and holistic management approach:

- 1 Data Collection.
- 2 Planning & Implementation.
- 3 Financing.
- 4 Partnerships & Community Stewardship Initiatives.
- 5 Engagement Initiatives.
- 6 Education, Training, and Research Initiatives.
- 7 Monitoring, Maintenance, and Adaptive Management.
- 8 Adherence to Laws and Guidelines (i.e., guidelines, standards, policies, and laws).
- 9 Climate Change Mitigation Initiatives.

When developing the Actions, the MVRMP (MVA, 2017) was consulted to ensure the RSBBA’s Actions were in alignment with the named plan. Where the NAMP could expand or support the goals of the MVRMP (MVA, 2017), Actions were developed.

A complete list of the Actions identified for each Strategy can be found in **Appendix B**. The Actions Summary lists each Action per Strategy, the expected output or measure of completion, and the priority of each Action, i.e., short-term (1-year), mid-term (5 years, or long-term priorities (5+ years). The shorter time frame for the Actions represents the immediate steps which may be taken to manage the site.

Actions were added to the Results Chains to show the progression of the Actions required to advance each of the Strategies. For a visual representation of how the Actions are tied to the Strategies, refer to Section 5.6.6 – Action Plan Summary for the complete Results Chains.

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### 5.6.5 STEP FIVE: OBJECTIVES

**Objectives** are defined as a formal statement detailing a desired outcome of a Strategy, such as reducing a Critical Threat or decreasing vulnerability to climate change (CMP, 2020). For each of the identified Strategies, one or more Objectives have been identified as a means of measuring the effectiveness of the Strategy in achieving a Goal or Goals. See Section 5.5.6 Action Plan Summary for a list of Objectives and their relationship to the Strategies.

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### 5.6.6 STEP SIX: ACTION PLAN SUMMARY

The Action Plan is one part of the Strategic Plan to manage the site long-term. The Action Plan Summary provides a complete overview of the recommendations of the NAMP team to achieve the Targets, Goals, and Objectives, by utilizing the Strategies to mitigate the Direct Threats, Stresses, and Indirect Threats, and make use of Opportunities.

The Action Plan Summary below includes the following:

- 5 Summary of Targets & Goals.
- 6 Summary of Strategies, Actions, and Objectives.
- 7 Summary of Results and Assumptions.

The Action Plan is intended to be used to guide future management of the RSBBA. Future efforts should employ each of the Strategies, undertaking the associated Action in order of listed priority with the aim of achieving the Objectives and Goals. Should these Goals and Objectives be met, the Targets are assumed to be achieved and will result in an improved state for the site. This Action Plan is intended to be used in conjunction with the Management Plan and Operational Plan included in subsequent sections of this NAMP.

**SUMMARY OF TARGETS AND GOALS**

The following Goals (**Table 5-16**) will be used to measure the success of the initiatives on site and measure the health of the Target. Goals are Target specific and reflect the KEAs identified during the Viability Assessment of each Conservation Target. A 10-year timeframe has been used as a benchmark for the Goals to provide a measurable time when the NAMP should be reevaluated as a whole and updated as required to represent current data.

**Table 5-16: Summary of Targets and Goals**

TARGETS	GOAL(S)
Forests (Conservation Target)	Goal One: By 2035, there is no reduction in forested habitat; the native flora species abundance and diversity is in a stable population with a Shannon-wiener Diversity Index of 3.0-3.49.
Wetlands (Conservation Target)	Goal Two: No more than 10% reduction in the total extent of wetland ; water quality meets the CCME WQI Value 80-90; and catchment areas are functional.
SOMC (Conservation Target)	SOMC: Goal Three: By 2035, SOMC increase in detection of SOMC through habitat restoration initiatives and ongoing monitoring.
Historical & Cultural Connection (Human Well-Being Target)	Goal Four: By 2035, historically and culturally significant features are identified and protected; historical and cultural programs are developed and implemented.
Education & Connection to Nature (Human Well-Being Target)	Goal Five: By 2035, the educational programs are identified and implemented; infrastructure and programs allow for a connection to the landscape.
Recreation (Human Well-Being Target)	Goal Six: By 2035, recreational uses are supported through infrastructure, a comprehensive recreational plan is developed and implemented.

## SUMMARY OF STRATEGIES, ACTIONS, AND OBJECTIVES

The following Strategies, Actions, and Objectives were developed to support the various Goals developed. It is anticipated that multiple Strategies, and associated Actions and Objectives will be utilized to achieve each Goal successfully. Objectives follow the same 10-year timeframe used in Goal setting, while Actions have shorter timeframes and priority of implementation (i.e., Short-Term [one-year], Mid-Term [five years], and Long-Term [five+ years]). The shorter time frame for the Actions represents the immediate steps which may be taken to manage the site. For a complete list of the Actions associated with each Strategy, including the priority of each Action, refer to **Appendix C**.

**Table 1-2 Summary of Strategies and Objectives**

STRATEGY	OBJECTIVE(S)	GOAL(S) SUPPORTED
<p><b>1 Baseline Collection &amp; Data Management</b></p> <p>Ongoing biophysical data collection and analysis (e.g., targeted baseline and monitoring) in an appropriate timeframe to support and confirm the successful execution of the conservation tools developed to restore/reclaim/enhance aspects of the site. Development of a data management system to collect, store and share data.</p>	<p>Objective 1.1 By 2035, initial baseline studies have all been identified and ranked in importance, and individual assessments have been executed.</p> <p>Objective 1.2 By 2025, data management system has been developed and is operational.</p>	All goals.
<p><b>2 Policy, Enforcement, and Urban Planning</b></p> <p>Establish protection of the site through existing planning tools acquisition of additional lands; existing and future policy; ongoing governance and enforcement.</p>	<p>Objective 2.1 - By 2035, land acquisition plan is developed and implemented; additional land is acquired should it become available. Due to the current land ownership of adjacent lands, this objective is low.</p> <p>Objective 2.2 – By 2035, the site is zoned appropriately for a natural area; future planning on and off-site adheres to land use designation.</p> <p>Objective 2.3 – By 2035, enforcement of bylaws, policies, and site rules are planned for and implemented.</p>	All goals.
<p><b>3 Buffering of Adjacent Lands</b></p> <p>Reduce the threats of the incompatible off-site land use by considering and implementing on-site buffering methods; collaborate with off-site landowners to plan and implement off-site buffering methods; and form stewardship opportunities with adjacent residents/landowners.</p>	<p>Objective 3.1 – By 2035, on-site buffering measures are in place, and threats from off-site incompatible land uses are mitigated; partnerships with landowners are formed &amp; plans developed that consider buffering of the site; adjacent residents and landowners are engaged and active in the stewardship of the site.</p>	All goals.
<p><b>4 Enhancements &amp; Improvements</b></p> <p>Reduce threats of invasive species and improve degraded lands through enhancement and improvement initiatives.</p>	<p>Objective 4.1 - By 2035, restoration/rehabilitation/enhancement areas have been identified, prioritized, funding allocated, and various plans initiated (funds permitting); health of vegetation communities improved.</p>	All goals.
<p><b>5 Invasive &amp; Undesirable Species Management</b></p> <p>Control of invasive and undesirable species pursuant to applicable provincial legislation, regulations, policies, guidelines and bylaws.</p>	<p>Objective 5.1 – By 2035, all provincially listed noxious, and nuisance weeds have been identified, influence on site have been categorized, site-specific Integrated Pest Management (IPM) plan(s) have been developed and executed as required.</p> <p>Objective 5.2 - By 2035, all undesirable species/invasive species (not provincially listed) have been identified,</p>	All goals.



STRATEGY	OBJECTIVE(S)	GOAL(S) SUPPORTED
	influence on site have been categorized, site-specific IPM plan(s) have been developed and executed as required.	
<p><b>6 Natural Disturbance Regime Management</b></p> <p>Develop and implement natural disturbance regime management to promote healthy vegetation communities which normally would be subject to natural disturbances.</p>	Objective 6.1 – By 2035, appropriate site-specific disturbance mechanisms to manage natural nutrient cycling and species composition/health are understood and selected; frequency of application agreed to and prescribed; and plans developed and initiated.	All goals.
<p><b>7 SOMC (Flora &amp; Fauna) Management</b></p> <p>Protection of identified habitat and sensitive locations for known (current and future) SOMC within the site based on baseline/monitoring analysis, and present and future standards.</p>	Objective 7.1 - By 2035, fauna and flora SOMC species number, locations, and population extents have been categorized, ranked in importance, and species-specific enhancement programs are implemented (as required).	All goals.
<p><b>8 Historically and Culturally Significant Species &amp; Features Management</b></p> <p>Historically and culturally significant species and features identified, protected, enhanced and celebrated.</p>	<p>Objective 8.1 - By 2035, appropriate Indigenous and other communities engaged, species identified, culturally significant features identified, plan(s) developed and implemented.</p> <p>Objective 8.2 - By 2030, historically significant features are verified, assessed, and protected and enhanced as required. Engagement plan is initiated.</p>	All goals.
<p><b>9 Water Management</b></p> <p>Management of all hydrological features within the site.</p>	Objective 9.1 - By 2035, hydrological processes associated with the sustainability of the various waterbodies (natural wetlands, relationships with groundwater, and drainage linkages) are understood, and a staged plan is developed to maintain the pre-development hydrological inputs, and executed as internal and external development within the identified local catchments occurs. This should include a review and subsequent repair of any impacts to hydrological inputs or connections currently in place. Includes any proposed culvert improvements.	All goals.
<p><b>10 Ecological Connectivity Management</b></p> <p>Management of intra and inter-connectivity.</p>	<p>Objective 10.1 – By 2035, current and future intra-connectivity requirements are understood, planning complete, and infrastructure (if any) installed and monitored.</p> <p>Objective 10.2 - By 2035, the role that the site represents within the greater Meewasin Valley in a post-development ecological context is understood; Plans to maintain important inter-connectivity elements are addressed at any future land use changes proposed in immediately surrounding of the current and future extent(s) of the site.</p>	All goals.
<p><b>11 Human Use Programming</b></p> <p>Planning for active and passive recreation of the site in balance with the ecological sensitivities of the site.</p>	Objective 11.1 – By 2035, human-use needs are understood, plans developed, implemented, and monitored; responsible human-use of the site which does not harm the natural assets.	Goals associated with Human Well-Being Targets.

**Results Chains** are a graphical depiction to illustrate core assumptions and the logical sequence linking the identified Strategies to one or more of the defined Conservation Targets. For each of the identified Strategy, a results chain has been prepared and is illustrated below.

Note that Strategy #1 does not have a stand-alone results chain as other Strategies must be implemented in conjunction with Strategy #1 to have an effect on the Threats. As such, Strategy #1 is included as a vital step in each of the other Strategies.

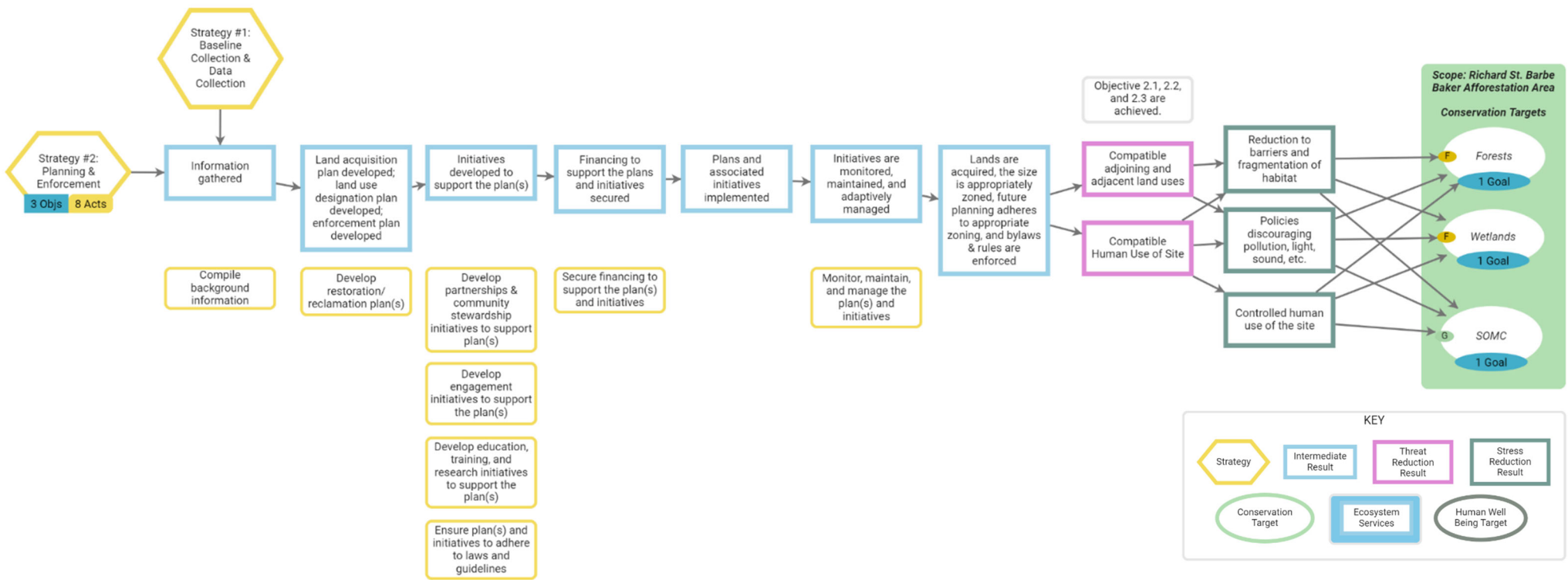


Figure 5-8: Results Chains - Strategy #2

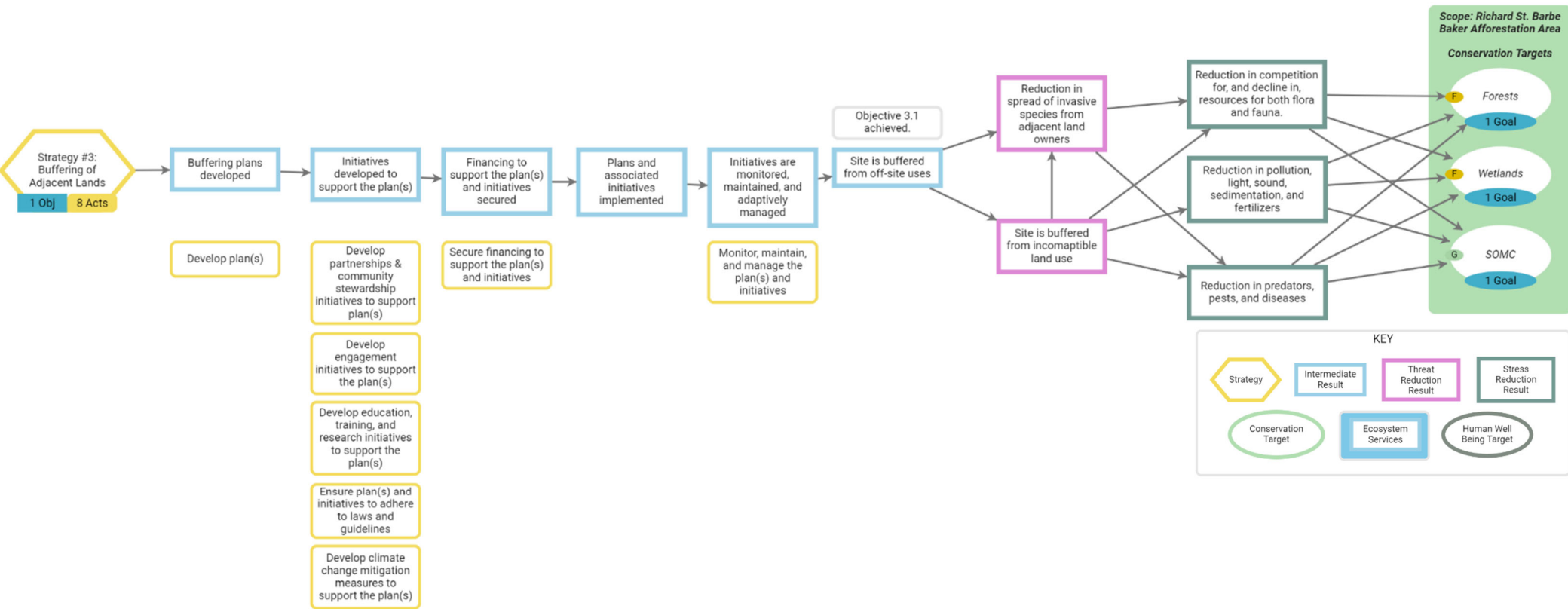


Figure 5-11: Results Chain - Strategy #3

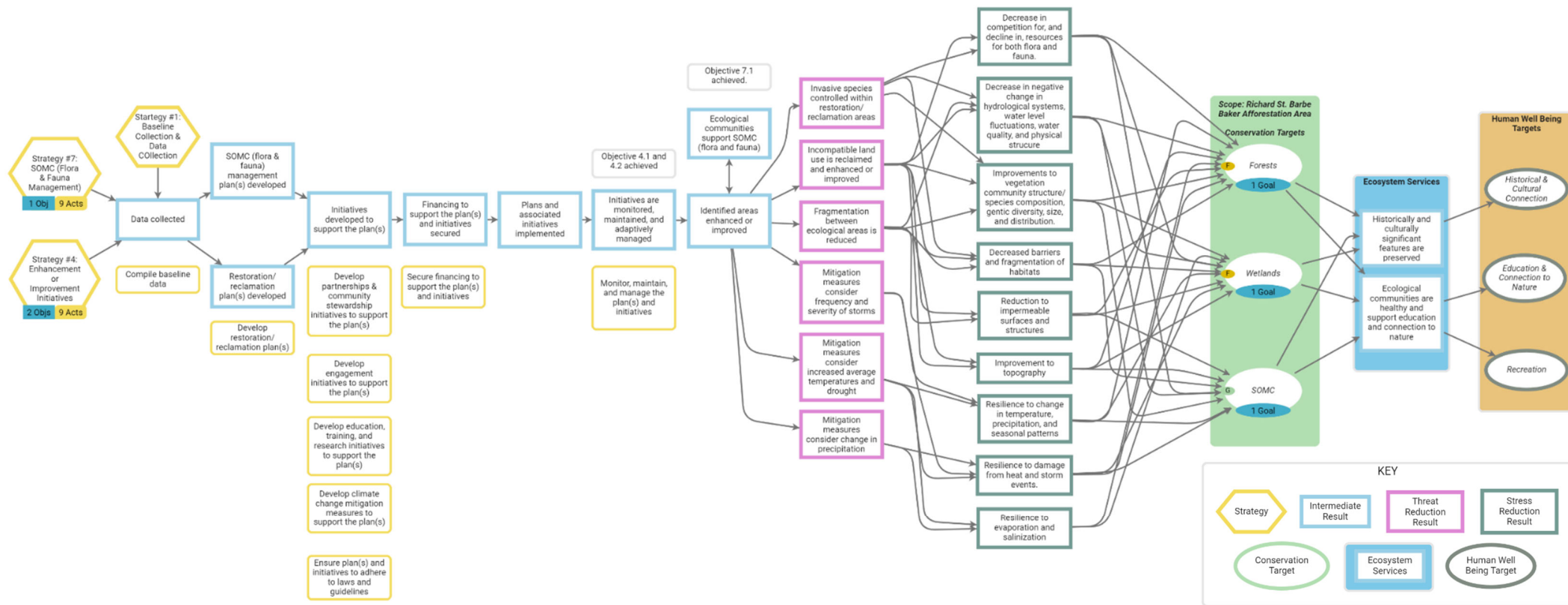


Figure 5-14: Results Chain - Strategy #4 & 7

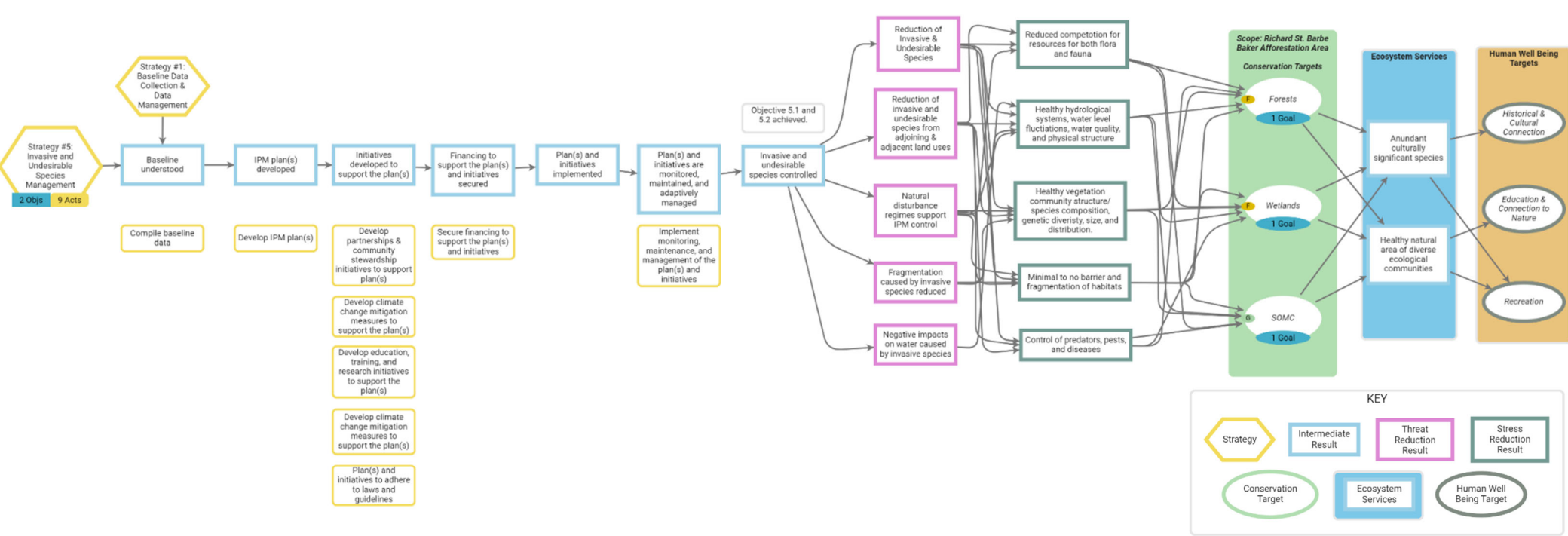


Figure 5-9: Results Chain - Strategy #5

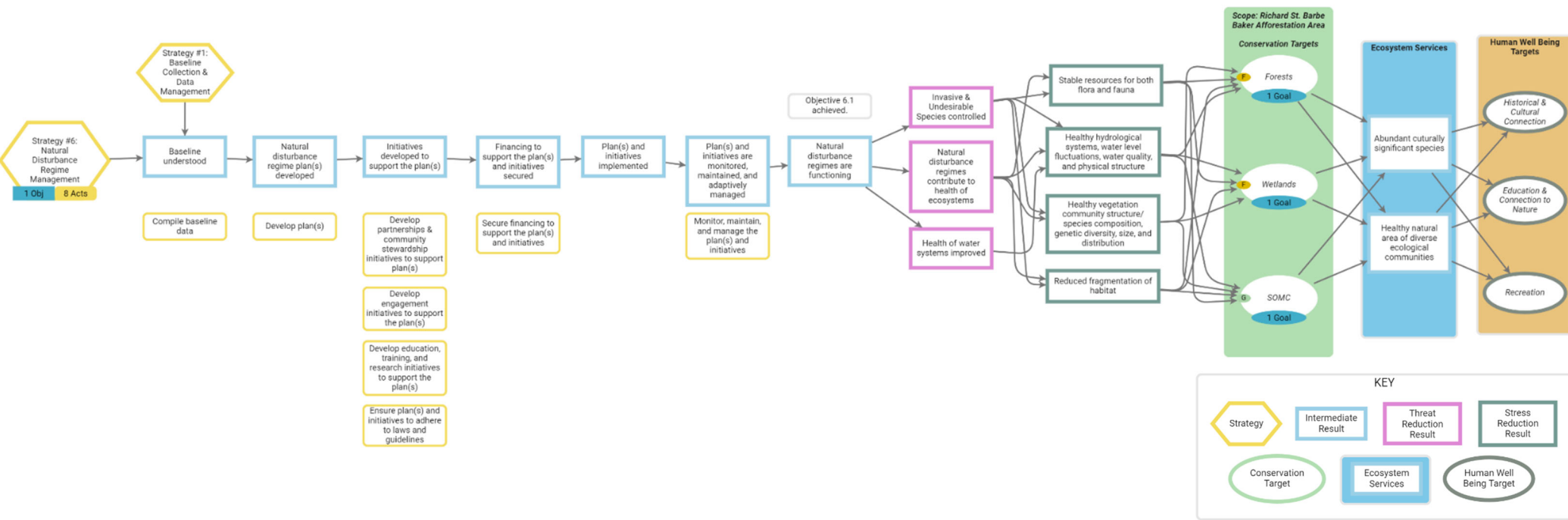


Figure 5-10: Results Chains - Strategy #6

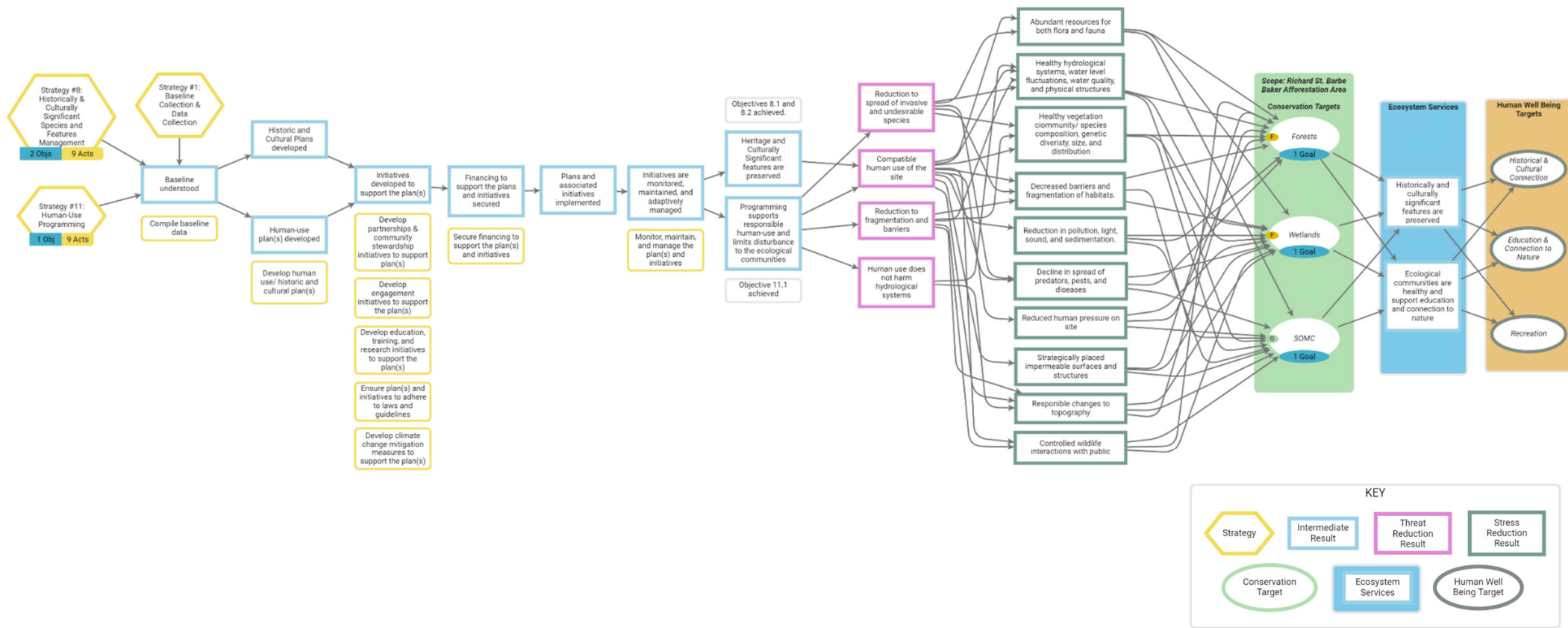


Figure 5-11: Results Chains - Strategy #8 & #11



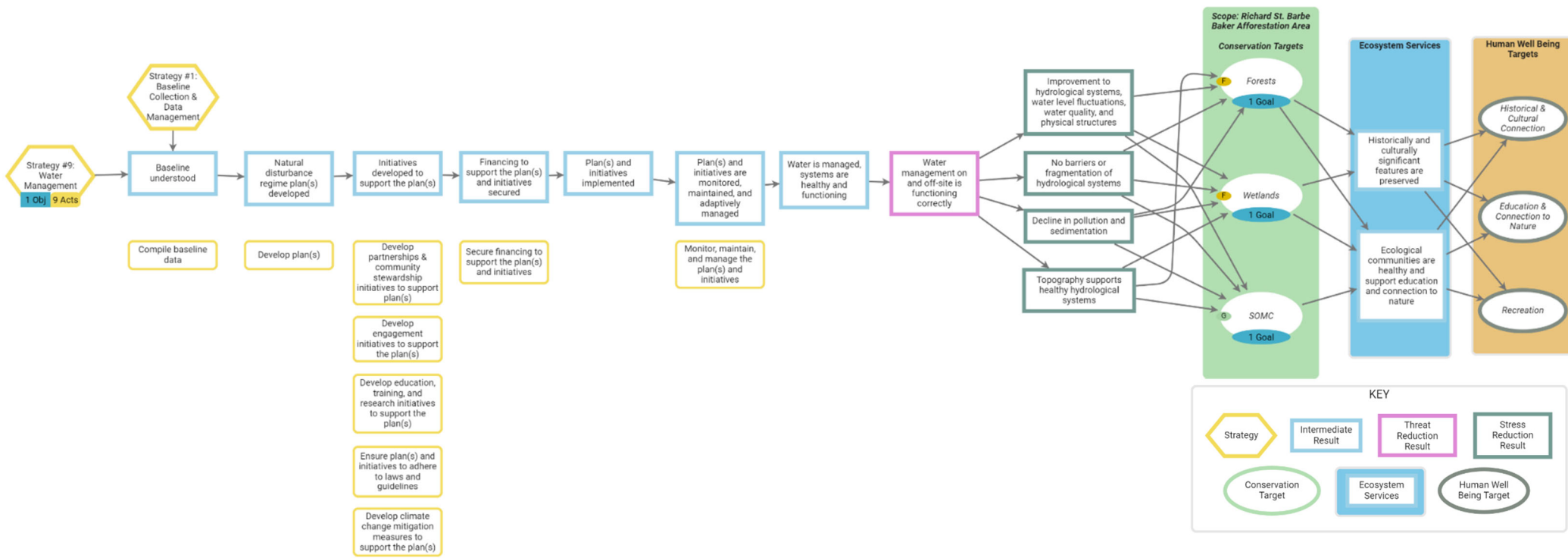


Figure 5-12: Results Chains - Strategy #9

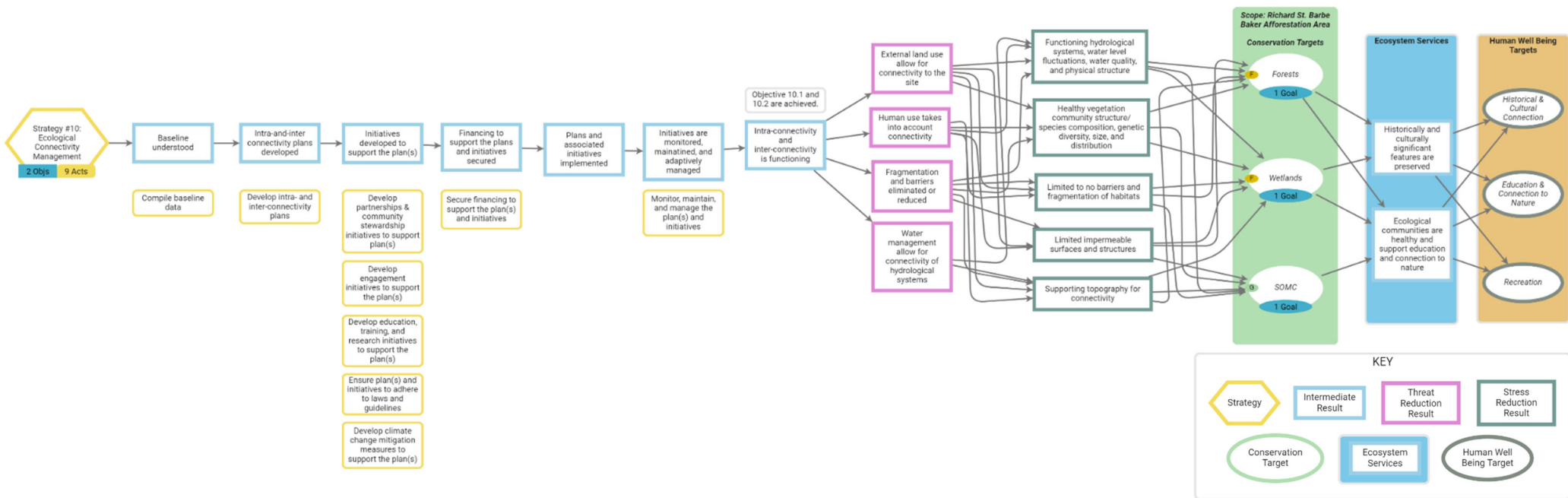


Figure 5-13: Results Chain - Strategy #10

# 6 HUMAN USE

Anticipation of current and future human use through ecologically sensitive design is critical for the long-term protection of the site. Without proper planning, the site will continue to be subjected to unsanctioned human use (e.g., “volunteer” trail formation), thereby increasing the probability that sensitive ecosystems and species at risk could be impacted.

Successful human use planning and ecologically sensitive design considers the needs of humans and the protection of the environment by limiting or eliminating disturbance. Long-term human use management should consider balancing appropriate uses of the site based on the environmental sensitivity present (e.g., currently identified or discovered in the future), targeted public enjoyment vectors (e.g., recreational use), and public safety.

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## 6.1 PUBLIC USE AND INFRASTRUCTURE

Public use of the site considers the appropriate programming of the site, restrictions on use, the infrastructure required to support the recommended uses, and opportunities for community stewardship. These recommendations are intended to be used to guide the future design programs.

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### 6.1.1 PROGRAMMING

Human use programming (i.e. design for use) of the site is heavily influenced by the feedback received during stakeholder engagements. As such, the programming first considers the conservation of the site and, secondly, responsible recreation. It is recommended that human use programming supports the Human Well-Being Targets and considers the following:

- Opportunities for historical and cultural connection
  - Opportunities for education and connection to nature
  - Opportunities for recreation
- 

### 6.1.2 MANAGEMENT ZONES

Three management zones (Ecological Core, Programmable, and Utility Corridor) have been developed for the site upon the existing conditions of the natural features as reviewed by the Biophysical Baseline Environmental Summary. They will influence the programming and management of the site and inform the location of appropriate site uses. **Table 6-1** provides a summary of each zone, including a summary of the spatial extent, proposed programming, and design considerations. For a visual of the zones, refer to **Appendix A – Figure 9**.

Note, the management zone extents currently presented will be subject to change as new information is received and initiatives are undertaken (e.g., baseline data collection and monitoring program advancement). The spatial extents of the presented management zones should be reviewed as part of the management plan review process.

**Table 66-1: Programming Zones**

	ECOLOGICAL CORE ZONE	PROGRAMMABLE ZONE	UTILITY CORRIDOR ZONE
Spatial Extent	Existing wetlands and known locations of species of concern.	Existing communities of fair or degraded landscapes.	Existing utility rights-of-way.
Proposed Programming	Limited low-impact passive recreation. Education and connection to nature & history.	Passive and active recreation. Education and connection to nature & history.	Passive recreation. Utilities management.
Design Considerations	Protect and buffer zone from other land uses, on-and-off site. Utilize various barriers such as fences, gates, and barricades to limit access. Enhance zone through planting or restoration activities, if deemed necessary. Limit additional infrastructure and locate it at appropriate offsets from sensitive species. Support educational opportunities to highlight importance of the natural assets.	Enhance zone through planting or restoration activities, if deemed necessary. Infrastructure located at appropriate offsets from sensitive species. Locate higher-impact infrastructure, within existing degraded areas. Support educational opportunities to highlight importance of the natural assets.	Consider opportunities to enhance biodiversity and human access while complying with utility easement requirements (Section 1.2 – Project Location and Local Context).  Any proposed elements must comply with applicable organization.

### 6.1.3 PERMITTED USES AND RESTRICTIONS

To support the Human Well-Being Targets, the following uses (**Table 6-2**) are recommended to be permitted and encouraged. Based on the permitted uses, restrictions are to be implemented to reduce and/or remove the risk of harm to ecological communities present.

**Table 6-2: Permitted Uses and Restrictions**

	DESCRIPTION	HUMAN WELL-BEING TARGET SUPPORTED	RESTRICTIONS ON ACTIVITY
Passive Recreation	Low impact activities such as walking/hiking, birdwatching, photography, and snow shoeing.	Supports the Targets of “Historical & Cultural Connection,” “Education & Connection to Nature,” and “Recreation” by allowing for controlled access to the historical, cultural, and environmentally significant features of the site, and opportunities for recreation.	Visitors must remain on trails. Use of site is recommended to be from dawn to dusk to avoid unwanted uses of the site.

	DESCRIPTION	HUMAN WELL-BEING TARGET SUPPORTED	RESTRICTIONS ON ACTIVITY
Active Recreation	All season biking, including fat tire biking. Adaptive Mountain Biking. Skills biking. Off-leash dog exercise. Winter activities such as cross-country skiing and snow shoeing can be considered and encouraged on designated trails if compatible with other uses.	Supports the Target of "Recreation" by allowing for controlled and responsible recreational uses.	Visitors must remain on trails. Use of site is recommended to be from dawn to dusk to avoid unwanted uses of the site, unless otherwise deemed appropriate for specific uses (i.e., fat tire biking).
Educational Tours	Group tours (e.g., school groups) or self-guided.	Supports the Targets of "Historical & Cultural Connection" and "Education & Connection to Nature" by providing educational and understanding of historical, cultural, and environmental topics.	Same restrictions as "Passive recreation."
Harvesting*  *subject to further engagement and research.	Harvesting of culturally significant plants by designated professionals or individuals.	Supports the Target of "Historical & Cultural Connection" by allowing for traditional use of culturally significant species and the land.	To be developed through further engagement. Considerations may include specific areas or plants which can be harvested, and seasonal timeframes of harvesting.
Citizen Science	Public assists in collecting data to accelerate scientific research.	Supports the Target of "Education & Connection to Nature" by allowing for the public to interact with the environment and further citizen research.	Same restrictions as "Passive recreation."

#### 6.1.4 INFRASTRUCTURE TO SUPPORT PERMITTED USES

Infrastructure recommended to support the permitted uses and programming have been identified and are listed in **Table 6-3** below. Infrastructure should be reviewed during future detailed design and planning of the site.

**Table 6-3: Infrastructure**

TYPE	DESCRIPTION	INFRASTRUCTURE
Site Access	Controlled site access to provide protection from illegitimate uses, control access in-and-out of the site, define boundaries, and assist in wayfinding.	Signage. Perimeter fencing. Safety fencing. Gates & blockades. Boot cleaning stations. Waste receptacles. Parking lots. Restroom facilities.

Circulation Route & Seating Nodes	Trail system to guide visitors through the site, while avoiding sensitive features. Seating nodes to provide areas of rest and contemplation. Layout of circulation system to tie into future adjacent developments.	Trails (of various types and functions). Benches. Signage.
Off-Leash Dog Park	Existing fenced off-leash dog exercise area. Upgrades and changes to the alignment of fencing is subject to engagement with user groups and easement holders.	Signage. Bag dispensers. Benches. Furniture for interest (e.g., boulders or logs).
Skills Park	Facilities to support the existing skills park. Further consultation is required between the City and Cedar Villa BMX Group to assess the need for upgrades to infrastructure, and features needed to buffer or mitigate environmental impacts.	Upgrades to be determined through future consultation with user groups.
Fat Tire & Adaptive Mountain Biking	To encourage the continued use of the site as a winter fat tire biking destination and encourage the future use of the site as an adaptive mountain biking destination.	Upgrades to be determined through future consultation with user groups.
Gathering Areas	Allows for community engagement, rest, education, and ceremonial uses.	Seating. Signage. Waste receptacle.
Wetland Outlook	Allows for access to and engagement with a sensitive area without causing damage.	Seating. Signage.
Communications Programming	Signage for site recognition, wayfinding, education, interpretation, emergency locators, and rules.	Site map. Wayfinding. Educational signage. Prohibited use signage.

### 6.1.5 PROHIBITED USES

Prohibited Uses are activities which have a high potential to be disruptive and cause ecological harm. The following are activities which are recommended to be discouraged, and labelled as Prohibited Uses, on site. The City of Saskatoon may wish to add to this list as new risks are identified.

- No off-leash dogs outside of the designated off-leash dog park area
- No motorized vehicles, including but not limited to ATVs, snowmobiles, passenger vehicles, and exceptions made to utility service and maintenance vehicles
- No collecting of wildflowers or plants (unless sanctioned as harvesting. See Permitted Uses)
- No dumping or littering
- No hunting or poaching
- No swimming or skating

- No camping or overnight use
- No use of site outside of posted hours
- No open fires
- No use of site off designated trails

### 6.1.6 OPPORTUNITIES FOR COMMUNITY STEWARDSHIP

Opportunities for community stewardship should focus on the community taking an active role in caring for and maintaining the ecological health and recreational value of the area.

Community stewardship is recommended at multiple levels, including:

- 1 Engagement of the community:
  - a During the implementation of the Strategies and Actions, throughout future design programs, construction, and maintenance phases. Fostering a sense of stewardship of the site from the design stage is critical to initiating a sense of ownership of the site.
- 2 Cultivation of volunteer and partnership opportunities, such as with:
  - a Local nature groups, such as the Saskatoon Wildlife Federation and Saskatoon Nature Society.
  - b Local advocacy groups, such as the FSAA.
  - c Organizations which may use the site for educational purposes, such as local schools.
  - d Companies which may support future site enhancement initiatives, such as local native plant suppliers.
  - e Local compatible user groups, such as bird watching groups.
  - f Local experts and conservationists, such as the MVA.
  - g Indigenous communities.

Volunteer and partnerships can be utilized to organize the following community stewardship initiatives (**Table 6-4**):

**Table 6-4: Community Stewardship Opportunities**

COMMUNITY STEWARDSHIP INITIATIVE	DESCRIPTION
1 Planting Program	Engage the community in planting initiatives, such as planting days.
2 Invasive Species Control Program	Engage the community in invasive species control, such as removal of invasive species.
3 Maintenance Program	Engage the community in maintenance of the site, including maintenance of trails, site furniture, fence repair, and garbage clean up days.
4 Educational Program	Encourage the community to organize educational programs, workshops, and guided nature walks to raise awareness about local ecosystems, wildlife, and the importance of conservation.
5 Monitoring and Reporting Program	Encourage the community to participate in data collection efforts to monitor the health of ecosystems, water quality, and wildlife populations. This information can help inform conservation strategies.
6 Advocacy and Outreach Program	Encourage the community to advocate for policies and regulations that protect the natural area. Advocacy and outreach can be supported by such means as social media campaigns.
7 Artistic Program	Encourage creative projects like art or photography exhibitions which can highlight the beauty and significance of the natural area, fostering a deeper connection with the community.
8 Cultural Programs	Engage with Indigenous groups to develop cultural programs which may focus on such things as, education of the public on culturally significant species, and harvesting.

## 6.2 PUBLIC SAFETY AND CPTED

To ensure safety for site users, the City of Saskatoon’s Crime Prevention Through Environmental Design (CPTED) must be adopted into the future site design. Per the recommendations of the CPTED committee, the site was reviewed for a Crime and Safety Risk Assessment, and recommendations were developed for each of the CPTED policies (**Table 6-5**).

**Table 6-5: Crime & Safety Risk Assessment**

RISK	MITIGATION MEASURE
Conflicting user groups (i.e., physical conflict between cyclists and walkers).	Signage on trails indicating permitted uses, encouraging low speeds along the trails, encouraging “Right-of Way” for pedestrians, maintaining sightlines at trail intersections, and gentle curves along the trails.
Water safety (i.e., risk of falling into wetlands).	Prohibiting use of wetlands for swimming (both humans and dogs). Buffering of wetland edges and posting signage to discourage access into riparian edges of the wetland. If developed, implementing climb-resistant railings on wetland outlook.
Uneven terrain (i.e., slips, trips, and falls).	Utilizing durable surfacing materials for improved accessibility along primary trails. Posting signage indicating which trails are accessible.
Emergency situations (i.e., ability of emergency vehicles to access and locate the site).	Posting a site map at each entrance indicating the information recommended by the CPTED policies.
Wildlife encounters (i.e., conflict between people and pets with local wildlife).	Encouraging on-leash only when outside of off-leash area by means of signage. Posting signage at site entrance to inform and educate (i.e., “entering a wildlife area”). Encouraging people to stay on trails and not to feed wildlife.
Criminal activity (i.e., unintended use of the site, such as vandalism, theft, or assault).	Discourage criminal activity through encouragement of positive, or legitimate, uses of the site (i.e., cycling and other activities). Have posted hours of use at each site entrance (i.e., from dawn to dusk). Improve safety of parking lots by means of dark-sky compliant lighting.
Litter and trash (i.e., garbage left on site which could attract pests and diseases).	Discouraging littering and dumping within the site by means of signage and controlled access points. Posting education signage about the risk to wildlife and humans.
Disorientation (i.e., getting lost or disoriented on trails).	Wayfinding signage along trails and a site map at each entrance to orient users through the park. Signage will be clear and concise as to not overwhelming the reader but still provide adequate information.
CN Rail (i.e., conflict with active rail line at western access route).	Encourage site access from other parking lots or entrances to limit use of CN rail crossing. At crossing, post warning signs and retain sight lines. Erect fencing along property line to act as barrier between the site and the rail line.
Fires (i.e., unsanctioned bonfires risking uncontrolled wildfire).	Encourage reporting of unsanctioned fires. Post educational signage regarding risk of uncontrolled fires. Employ FireSmart prescriptions along property lines.
Uncontrolled dogs (i.e., off-leash dogs posing risks to others).	Dogs to be under control and watched by owner at all times. No aggressive dogs to be permitted. Off-leash use of site outside of permitted areas to be strictly prohibited. Implementation will require engagement and education.



RISK	MITIGATION MEASURE
Skills park (i.e., access for emergency situations, conflict with maintenance vehicles and pedestrians along access route through site, and safety of users).	Maintain and enhance vehicular access route to skills park to allow for maintenance access. Enforce minimal speeds through area and "right-of-way" for pedestrians. Safety of skills park user groups to be encouraged through responsible use of the park and understanding of liability (signage).

## 6.2.1 CPTED POLICIES AND RECOMMENDATIONS

To ensure future planning complies with the City of Saskatoon's CPTED policies, each of the 11 policies related to public parks (which is the most applicable to a natural area) have been reviewed and a recommendation applied. The following outlines each of the CPTED policies and recommendations for the site.

**Table 6-6: CPTED Policies & Recommendations**

CPTED Policy	RECOMMENDATION
1.0 TERRITORIALITY RISK	
1.1 Risk Assessments	See Crime and Safety Risk assessment table above.
1.2 Name Signs	Large, easily readable signs to be maintained and erected at each entrance. Site entry signs to include the name of the site, maintenance, emergency numbers, and any other information established by the City of Saskatoon. Signs will be easily visible, and not blocked by landscaping material or snow during the winter months.
1.3 Edge Definition	Edge of park to be defined by perimeter fencing that is wildlife permeable.
2.0 NATURAL SURVEILLANCE	
2.1 Landscaping	Best practices to be employed for landscaping to enhance safety, such as retaining or enhancing sightlines, and reducing conflicts along trails.
2.2 Foliage	Plantings to be focused on naturalization of the park, and aesthetic value in areas of high-use, such as parking lots.
2.3 Lighting	Dark-sky compliant lighting should only be used, if at all, in strategic locations (such as the skills park).
2.4 Amenities	Placement of amenities in open, more visible areas to increase Natural Surveillance is recommended.
3.0 ACCESS CONTROL	
3.1 Fencing	Wildlife friendly fencing of the perimeter of site is recommended to define the area and prevent unwanted vehicular access.
3.2 Access Points	Formal entrance and/or exit points to be easily accessible for users to feel safe
4.0 IMAGE	
4.1 Management and Maintenance	Maintenance schedule for the park is recommended to manage benches, trails, waste receptacles, and other site features.
4.2 Lighting Repair	Lighting to be maintained in proper working order.

## CPTED Policy

## RECOMMENDATION

5.0 CONFLICTING USER GROUPS	
5.1 Conflicting Users	Legitimate use of the site to be encouraged by means of improvements to infrastructure and engagement with user groups. Illegitimate uses to be discouraged by means of signage and bylaw enforcement.
6.0 ACTIVITY SUPPORT	
6.1 Telephones and Emergency Devices	Emergency devices to be considered, including the implications for maintenance.
6.2 Seating and Benches	Proposed benches to be vandal resistant and well maintained. Benches to be located in highly visible locations for natural surveillance.
7.0 LAND USE MIX	
7.1 Nearby Activities	Existing parking lots to be retained for access to site and nearby activities.
8.0 MOVEMENT PREDICTORS	
8.1 Routes to Parks, Recreational Areas or Playgrounds	Existing route to park to be retained (vehicular access).
8.2 Routes within Parks	Routes within park to take into account circulation and permitted access points. Safety to be addressed through wayfinding signage.
9.0 DISPLACEMENT	
9.1 Consider Potential Displacement	Use of the site to be encouraged by means of signage, including hours of use.
9.2 Lighting On or Off	Wildlife complaint lighting is recommended for parking for public safety and discourage use after hours. Alternatively, parking lots are inaccessible after hours.
10.0 COHESION	
10.1 Bulletin Boards	Bulletin board to be recommended to post cultural events, community activities, and crime watch.
10.2 Naming of Park	Site is currently named after community member which is intended to enhance ownership. Suggested signage to inform visitors of the site's namesake.
11.0 CONNECTIVITY	
11.1 Gathering Areas	Gathering area is recommended within the site to build positive rapport with surrounding community, increase sense of ownership, and attract a variety of users without conflict.

## 6.3 GUIDANCE FOR THE IMPLEMENTATION OF SITE IMPROVEMENTS

Site improvements for human use are recommended to be implemented in a way which will limit, or eliminate, disturbance to the natural assets, including both flora and fauna (**Table 6-7**).

**Table 6-7: Guidance for the Implementation of Site Improvements**

IMPROVEMENT Considerations	ECOLOGICAL Recommendations
Construction (Timing and Methodologies)	Construction activities to limit disruption to sensitive wildlife and vegetation species. Timing of construction to be designated outside of known breeding and nesting periods. Movement of vehicles, excavation, and grading activities to be of minimal disturbance. Public consultation to occur prior to construction activities.
Wildlife	Locations of SOMC to be verified prior to construction or disturbance. Wildlife corridors to be verified prior to initiation of future designs.
Materials	It is recommended that materials be selected which will not leach or harm the environment over the course of the material's lifetime. Consider the effects of climate change in the placement and materials chosen for the infrastructure, for example greenhouse gas (GHG) impacts of the material chosen for the site.
Layout	Infrastructure to be placed where it will limit disruption to sensitive species, utilizing existing areas of disturbance where possible. Field-fit or confirm final placement on-site under the direction of a qualified consultant.
Buffering within Site	It is recommended that buffers or offsets be established between proposed site amenities and ecologically sensitive features/known locations of SOMC.
Buffering between Site and Adjacent Lands	It is recommended that the perimeter of the site be buffered from adjoining incompatible land-uses, such as the CN Railway Rail Yard Management site. Consider planting a shelterbelt of trees between incompatible land-uses, or other physical buffering methods.
Light & Sound Pollution	Lighting within the RSBBAA is discouraged. Any lighting in or near the site should be dark-sky compliant. Considerations for tree planting along the exterior of the site should be explored to mitigate the effects of exterior light and sound pollution.
Location of High Impact Features	Locate the following on the outer boundaries of the site: parking lots, washroom facilities, and lighting.
Ecological Connectivity Considerations	Future designs to consider wildlife and ecological connectivity in layout and design of features.
Monitoring	Monitor the impacts of infrastructure and site uses on the natural assets, and re-evaluate as needed.

# 7 LEGISLATIVE RECOMMENDATIONS

Future development proposals including concept plans shall consider and align with the information included in this and any associated planning reports and studies including but not limited to the Blairmore Sector Plan.

# 8 IMPLEMENTATION

To implement the Action Plan, a Monitoring Plan and an Operational Plan are required to complete the Strategic Plan. The Action Plan, Monitoring Plan, and Operational Plan will work together to guide the implementation of the NAMP by providing guidance on the required Strategies and Actions needed to achieve the Objectives, Goals and Targets, monitoring of the success and progress of the Strategies, and organizing the resources and finances required to execute the various Strategies developed for the site.

As the implementation of this NAMP may differ in responsibility from year to year, this section provides guidance on how to implement the Action Plan, the Monitoring Plan, and the Operational Plan.

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## 8.1 ACTION PLAN

The Action Plan framework is to be implemented based on the priority assigned to each Action in the Actions Summary (refer to **Appendix C** – Actions Summary), dependent upon financing and available resources. The future team(s) implementing the various plans required to successfully complete tasks for the site is advised to prepare detailed work plan(s) conforming to the following frameworks to harmonize the implementation of the overarching Action Plan and Monitoring Plan. More details on the Operational Plan can found in Section 8.3 - Operational Plan.

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## 8.2 MONITORING PLAN

Monitoring is essential to help a team track the implementation of actions and achievement of Goals and Objectives, test assumptions in the theories of change, reduce uncertainties, learn from information collected, and improve current and future programming (CMP, 2020).

Monitoring as part of an Action Plan is intended to gauge the progression of the plan and success of the Goals, Objectives, and Strategies. The Monitoring Plan prepared for the site follows the Conservation Standards, and addresses the “information needs, indicators and methods, spatial scale and location, timeframe, and roles and responsibilities for collecting data (CMP, 2020).

An adaptive approach to maintenance and management typically leads to greater success; therefore, a linkage from the various monitoring initiatives undertaken should drives changes to any required monitoring targets when considered over a period of time. As such, the information gathering through the monitoring process should be analyzed, and the Action Plan adapted as required to maintain the appropriate trajectory that leads to the greatest probability of successfully achieving the desired outcome.

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### 8.2.1 AUDIENCE AND INFORMATION NEEDS

The first step in developing an effective Monitoring Plan was the identification of the Audience and their information needs. In this step, it was determined what the monitoring will be conducted for, and which responsible parties will need to know for decision-making purposes. For the purposes of the NAMP, it was determined that the Monitoring Plan will primarily be utilized to inform the City of Saskatoon and its applicable Partners, such as the MVA. The information gathered through the Monitoring Plan framework may also be of use to stakeholders, and financial donors who may be interested in the progress and results of the Action Plan.

The information gathered in the implementation of the Monitoring Plan framework will help to answer the following questions:

- Are the Strategies and Activities being implemented as expected?
- Are the Goals and Objectives being achieved?
- What is working, what is not, and why?
- How can the Strategies be improved?
- Should the Goals and Objectives be reconsidered?

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## **8.2.2 MONITORING PLAN FOR ACTIONS, STRATEGIES, OBJECTIVES, AND TARGETS**

The Monitoring Plan considers monitoring requirements of the Action Plan, including the Actions, Strategies, Objectives, and Targets. Monitoring of the progression of the Actions, and the accomplishment of the Objectives and Goals will help to determine if the various initiatives detailed in this NAMP are successful in supporting the health of the Conservation Targets defined for the site and provide guidance on if Strategies and Actions should be re-evaluated.

### **MONITORING OF STRATEGIES AND ACTIONS**

Strategies and Actions are recommended to be monitored for progression (i.e., the status of the Action) and assess if that Action is effective in supporting the associated Strategy. The Operational Plan (Section 8.3) provides a tool to track the progression of the Actions (i.e., “on-track” or “delayed”), and record notes on the effectiveness of the Action. It is recommended that monitoring of the Strategies and Actions be completed in concert with their implementation.

Within each Strategy detailed in the Action Summary (**Appendix B**), there is an Action directly related to monitoring. Monitoring of certain Actions will require specific monitoring plans to monitor the success of the Action initiatives. For instance, each restoration plan (an Action) will require its own detailed monitoring plan, with the information gathered collected and analyzed for effectiveness.

To monitor the initiatives, it is recommended that future detailed monitoring plans for specific Actions follow a central Monitoring Framework. The monitoring activities recommended within the Strategy-specific Monitoring Plans should always consider the minimum amount of data required to inform the success of the associated Objective. A Monitoring Framework has been developed by WSP to guide future monitoring activities and can be found in the Conceptual Plan for the Richard St. Barbe Baker Afforestation Area (WSP, 2023). The Monitoring Framework considers the following:

- Wildlife Behaviour Monitoring.
- Invasive Species Monitoring.
- Vegetation Composition Monitoring.
- Environmental Conditioning Monitoring.
- Human-site Interaction Monitoring.
- Collectively Powered Monitoring Networks.

## *MONITORING OF OBJECTIVES, GOALS, AND TARGETS*

To track the status of the Goals and monitor the effectiveness of the Objectives individual Indicators, monitoring activities, and timelines have been identified. Indicators have been developed for each Goal and Objective, and meet the criteria of being measurable, precise, consistent, and sensitive (CMP, 2020). The monitoring activity, or methods, are the ways in which the indicators will be measured, and aim to be accurate, reliable, cost-effective, feasible, and appropriate (CMP, 2020). To support the monitoring plan, it should be specified who will be responsible for the monitoring activity, and when the monitoring activity should occur. The “responsibility” column should be filled out by the City of Saskatoon when the City is prepared to implement the NAMP.

The indicators for the goals align with the Indicators of the KEAs identified for each Conservation Target in the Viability Assessment (see Section 5.3 – Viability Assessment). The Viability Assessment should be updated yearly (or more frequently) as new information is gained relating to the status of the indicators as measured for the Goal. The status of the Conservation Target should then be updated. **Table 8-8-1** outlines the monitoring plan for the Goals and Objectives. Refer to Section 5.6.6 – Action Plan Summary for the Goals and Objectives.

**Table 8-8-1: Goals and Objectives Monitoring Plan**

GOAL/ OBJECTIVE	INDICATOR(S)	MONITORING ACTIVITY	RESPONSIBILITY	TIMEFRAME
Goal 1	Up to 25% increase in total hectares of forested areas from baseline conditions.	Monitor for change in spatial extent of remnant forests and afforestation areas.		Annually
	Native flora and fauna comprise at least 60% of all flora and fauna on site.	Monitor for change in spatial extent of native flora and change in population size of native fauna.		Annually
	Forest structure is diverse and has many layers.	Monitor for regeneration, adolescent, and/or mature trees or shrubs.		Annually
Goal 2	No reduction in wetland habitat	Monitor for change in spatial extent of wetlands.		Annually
	Water quality is protected with only a minor degree of threat or impairment; conditions rarely depart from natural or desirable levels.	Monitor water chemistry for changes in water quality.		Annually, or as projects demand.
	No restrictions on access to catchment areas.	Monitor for number of barriers in catchment areas.		Monthly (March-November)
	Native flora and fauna comprise at least 60% of all flora and fauna on site.	Monitor for change in spatial extent of native flora and change in population size of native fauna.		Annually
Goal 3	Minimum of 10% increase from baseline of SOMC and Culturally Significant Species.	Monitor for change in spatial extent/population size of SOMC and Culturally Significant Species.		Annually
	Native flora and fauna comprise at least 60% of all flora and fauna on site.	Monitor for change in spatial extent of native flora and change in population size of native fauna.		Annually
Goal 4	Historical and culturally significant features identified, protected and enhanced where possible.	Verify historical features identification and monitor protection or enhancement on site.		Annually
	Opportunities for public engagement and awareness are functioning and in place.	Monitor for number of educational programs yearly.		Annually
Goal 5	Educational programming is functioning, including signage and outreach programs.	Monitor for number of educational programs yearly. Monitor for usage of signage.		Annually
	Visitors are able to connect to the landscape by means of responsible use supported by low-impact infrastructure.	Monitor for user satisfaction, frequency of use, impact on ecological communities, condition of infrastructure, success of initiatives		Annually
Goal 6	Recreational uses are functional and complementary.	Monitor for user satisfaction, frequency of use, impact on ecological communities, condition of infrastructure, success of initiatives.		Annually



GOAL/ OBJECTIVE	INDICATOR(S)	MONITORING ACTIVITY	RESPONSIBILITY	TIMEFRAME
Objective 1.1	Verification initial baseline studies have all been identified and ranked in importance, and individual assessments have been executed.	Review of records.		-
Objective 1.2	Verification that data management system has been developed and is operational.	Review of records.		Annually
Objective 2.1	Verification that land acquisition plan is developed and implemented; additional land is acquired when it becomes available.	Review of records.		Annually
	Verification of the acquired land.	Review of records.		Annually
Objective 2.2	Verification that site is zoned appropriately for a natural area.	Review of records.		Annually
	Verification that future planning on and off-site adheres to land use designation.	Review of records.		Annually
Objective 2.3	Verification of bylaw, policies, and site rules enforcement.	Review of records/interview with local authorities.		Annually
Objective 3.1	Verification that on-site buffing measures are in-place and functioning.	Monitor success of buffer for evidence of human disruption.		Annually
	Verification of adjacent landowners are engaged, partnerships established, and NAMP recommendations have been integrated into future designs.	Monitor for success of implemented buffering systems.		Annually
Objective 4.1	Verification that restoration/ rehabilitation/ enhancement areas are identified, and plans are initiated.	Monitor for the creation of site-specific restoration/ rehabilitation/ enhancement plans.		Annually
	Verification that vegetation community health is improved.	Monitor plant vigor in reclamation sites.		Continuously to meet obligations. . Annually once completed.
Objective 5.1	Verification that site-specific IPMs for provincially listed noxious and nuisance have been prepared and executed.	Monitor for abundance and distribution of provincially listed noxious and nuisance species.		Twice per year (early season and fall)
Objective 5.2	Verification that site-specific IPMs for undesirable/invasive (not provincially listed) species have been executed.	Monitor for abundance and distribution of undesirable/ invasive species.		Annually
Objective 6.1	Verification that site-specific disturbance mechanisms are selected, and application plans initiated.	Monitor for enhanced nutrient cycling and species composition/health.		Annually

GOAL/ OBJECTIVE	INDICATOR(S)	MONITORING ACTIVITY	RESPONSIBILITY	TIMEFRAME
Objective 7.1	Verification that species-specific enhancement programs for flora and fauna SOMC are implemented.	Monitor for improved abundance, distribution, and diversity of SOMC.		Annually
Objective 8.1	Verification that Indigenous communities are engaged, and culturally significant species plans are implemented.	Monitor for number of relevant established Indigenous relationships and number of identified culturally significant species.		Monthly
		Monitor for enhancement of abundance, distribution, and diversity of culturally significant species.		Seasonally
Objective 8.2	Verification that historically significant features are protected, and programs are initiated.	Monitor for unchanged condition of historically significant features.		Annually
Objective 9.1	Verification that pre-development hydrological baselines are chosen, and a staged plan is executed.	Monitor for hydrological baseline documents and a management plan.		Annually
Objective 10.1	Verification that intra-connectivity requirements are understood, and (if any) are installed.	Monitor for intra-connectivity conflict.		Annually
Objective 10.2	Verification that inter-connectivity plans in the greater Meewasin Valley are addressed and topic is included in future land use changes to maintain general wildlife movement.	Monitor for creation of green spaces and/or wildlife corridors.		Annually
		Monitor for future land use projects and their approach to connectivity.		Annually
Objective 11.1	Verification that human-use needs are implemented.	Monitor for recreation user satisfaction.		Seasonally

### 8.2.3 ANALYSIS AND ADAPTATION

For the NAMP to be successful, the Action Plan, Monitoring Plan, and Operational Plan should be analyzed at a regular pre-determined frequency and adapted as required. It is recommended that the results of the Monitoring Plan be:

- Assessed for whether the Actions and Strategies are being achieved, and if they are effective in achieving the Objectives.
- Assessed for whether the Goals and Objectives are being met.
- Assessed for whether the status of the Targets have changed.

It is also recommended that the NAMP be reviewed, and relevant sections updated annually to capture any required changes based on the various initiatives executed, monitoring conducted, and any forthcoming management strategies not previously considered. The NAMP update review should also consider updates forthcoming from, but not limited to the MVRMP (MVA, 2017); municipal, provincial or federal legislation, bylaws, policies, guidelines, or frameworks; and future industry accepted practices for the sustainable management of the site that may apply.

## 8.3 OPERATIONAL PLAN

The Operational Plan is the final part of the three-part Strategic Plan (Action Plan, Monitoring Plan, Operational Plan). The Operational Plan is intended to synthesize the required funding and human capacity required to implement the Action Plan and Monitoring Plan. The successful implementation of the Action Plan and Monitoring Plan elements will require the proactive acquisition of funding and resources. It is recommended that a detailed work plan be developed based on each Action of the Operational Plan, including the specific individuals, rates, and timeframes per day or month required to be allocated to the execution of the Action. Plan is contingent upon allocations from the City budget, council review and budgetary cycling.

To guide the future implementation of the Action Plan and Monitoring Plan, the following Operational Plan template is provided below (see **Table 8-2**). This template is specific to tracking the progress of the NAMP, however detailed Operational Plans should be developed to track the future assets as well. The template is to be built from the Action Summary (**Appendix C**), and should be used to track, at a minimum, the following:

- Each Action (including the monitoring actions).
- Date of when the Action is to be initiated and completed.
- Responsible Department or Partner.
- Estimated Capital and Operating Costs.
- Progress of the Action (i.e., is the Action ongoing, delayed, or not started).
- Progress Details (i.e., monitoring notes on how the Action is performing).

**Table 8-2 Template for Operational Plan**

ACTIVITY	ACTIVITY DESCRIPTION	PRIORITY	DATE TO BE INITIATED AND COMPLETED	RESPONSIBLE DEPARTMENT (CITY AND Partners)	ESTIMATED CAPITAL AND OPERATING COSTS	PROGRESS	PROGRESS DETAILS
Ex. Strategy #1, Activity #1	Ex. Data collection	Ex. Short-Term	Ex. Month/Year to Month/Year	Ex. Parks	Ex. \$xxxx.xx	Ex. Ongoing	Ex. On track to be completed.

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## IMAGES

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### *COMPLETE LIST OF CITY-SUPPLIED DOCUMENTS REVIEWED FOR THE PROJECT*

- Management plan boundaries for RSBBA.
- Approved land use plans for adjacent areas (e.g., University Heights, Blairmore) found on the City's Sector Plan web page.
- Blairmore Natural Area Screening Final Report, 2022.
- Bylaw No. 9700 – Official Community Plan, 2020.
- City of Saskatoon Climate Adaptation Strategy:
  - Climate Projections and Possible Impacts (Part 1).
  - Corporate Climate Adaptation Strategy (Part 2).
- City of Saskatoon Contractor Environment Guidelines, 2019).
- City of Saskatoon Green Infrastructure Strategy, 2020.
- City of Saskatoon Pathways for an Integrated Green Network, 2022.
- City of Saskatoon Standard Construction Specifications, 2023.
- City of Saskatoon Wetland Policy (C09-041).
- Meewasin Northeast Policy, 2015.
- Meewasin Valley-wide Resource Management Plan, 2017.
- Montgomery Place Local Area Plan Final Report, 2018.
- Natural Areas Inventory for the City of Saskatoon, 2019.
- Natural Asset Inventory Dashboard, 2021.
- Natural Capital Asset Valuation Pilot Project, 2020.
- Northeast Swale Development Guidelines, 2012.
- Northeast Swale Resource Management Plan, 2013.
- Native Plant Solutions – RSBBA Study (draft report).



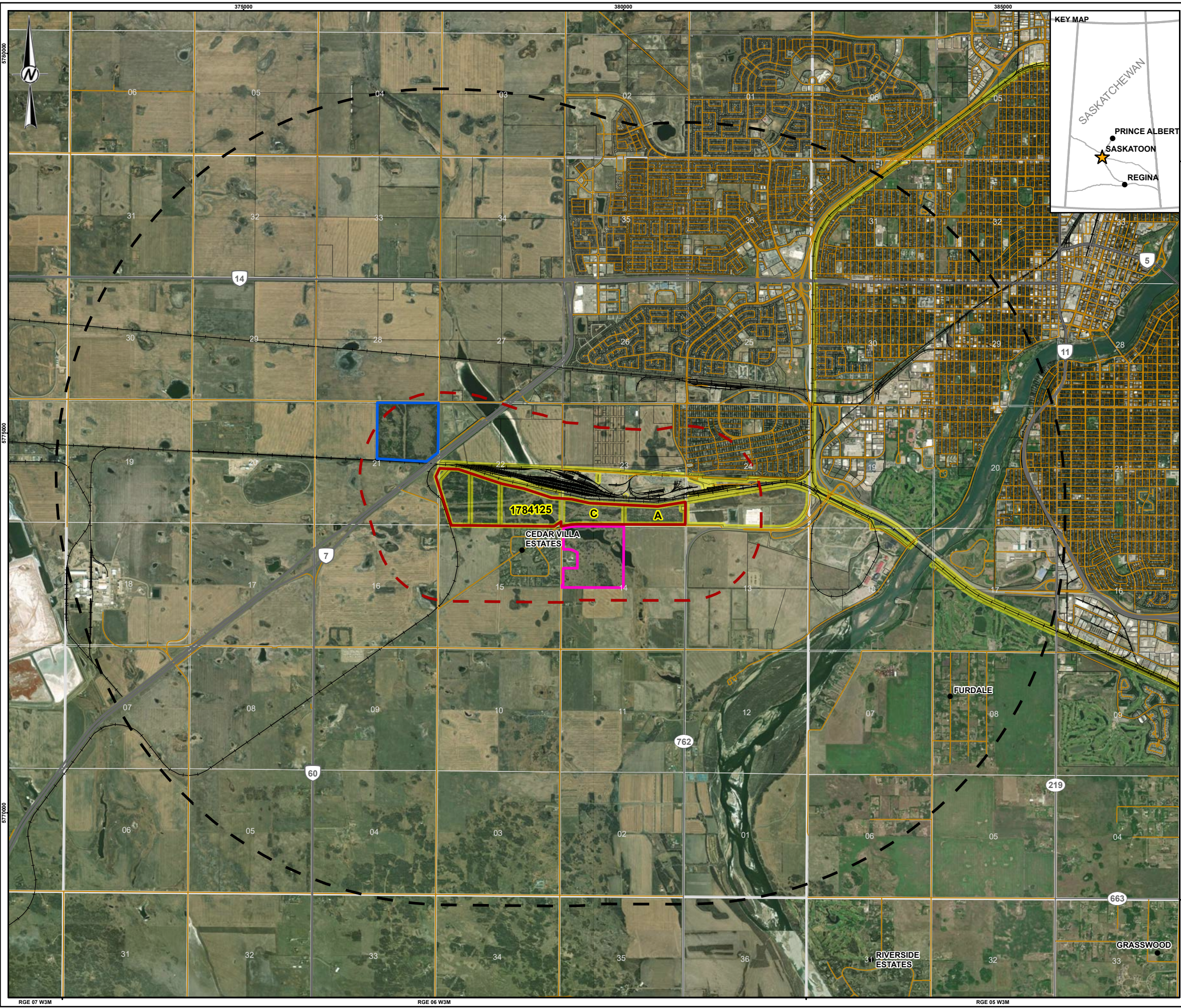
# APPENDIX

## A FIGURES



# FIGURES

- 1 Site Location & Context
- 2 Existing Natural Assets
- 3 Existing Topography & Soils
- 4 Existing Wetlands & Hydrology
- 5 Existing Wildlife SOMC
- 6 Existing Vegetative SOMC
- 7 Confirmed SOMC (10 Years)
- 8 Existing Nuisance and Noxious Weeds
- 9 Human Use & Context
- 10 Proposed Management Zones



- LEGEND**
- POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
  - RAILWAY
  - CN YARDS MANAGEMENT AREA
  - PARCEL BOUNDARY
  - PROJECT STUDY AREA
  - LOCAL STUDY AREA
  - REGIONAL STUDY AREA
  - CHAPPEL MARSH CONSERVATION AREA
  - GEORGE GENEREAU URBAN REGIONAL PARK



**REFERENCE(S)**  
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CLIENT  
 CITY OF SASKATOON

PROJECT  
 RICHARD ST. BARBE BAKER NATURAL AREA MANAGEMENT PLAN

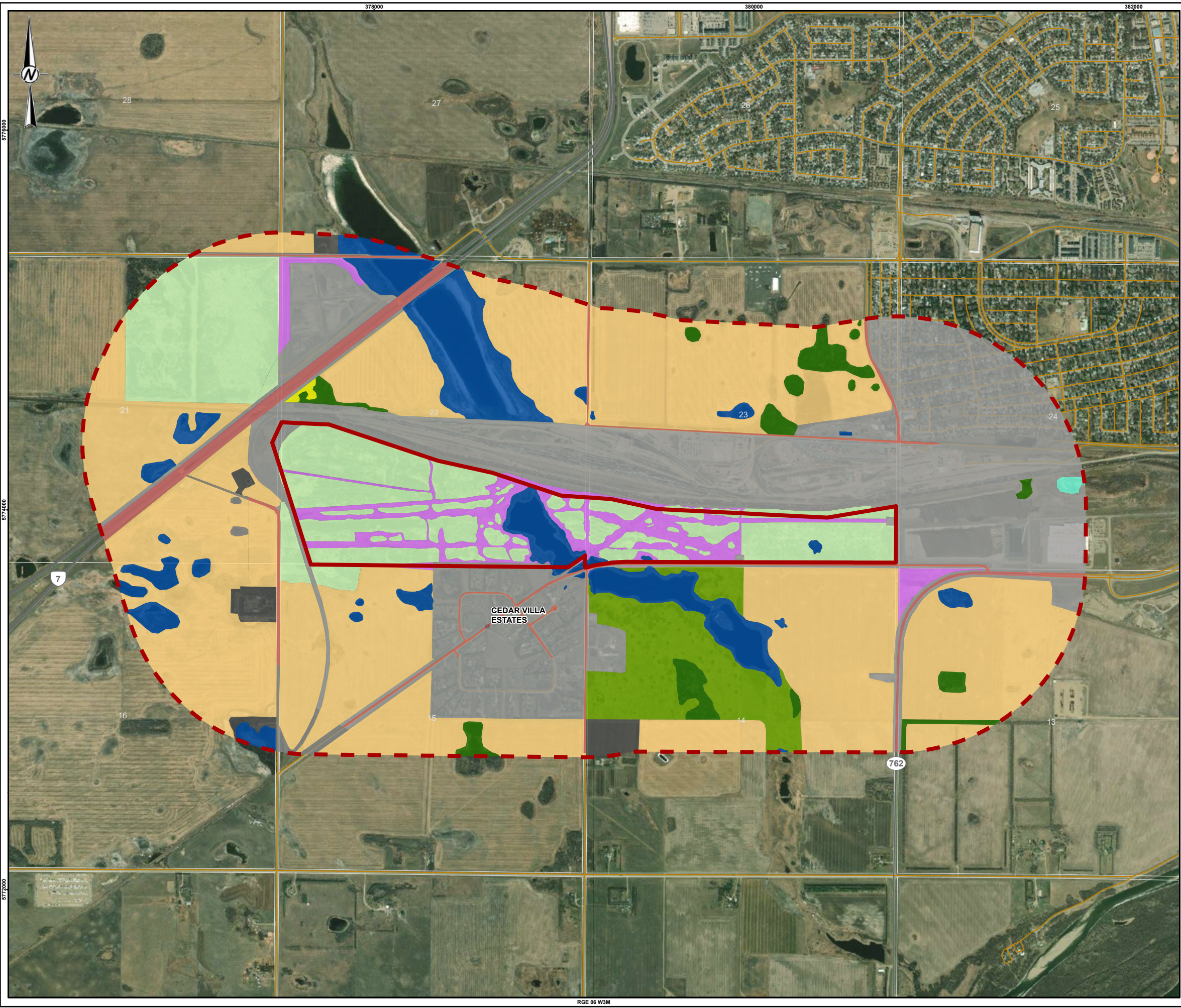
TITLE  
 SITE LOCATION

CONSULTANT	YYYY-MM-DD	2023-08-04
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	APPROVED	

PROJECT NO. CA0003383.0741 CONTROL 200 REV. A FIGURE 1

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



- LEGEND**
- PROJECT STUDY AREA
  - VEGETATION LOCAL STUDY AREA
  - POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
- LAND COVER**
- CLOSED CANOPY DECIDUOUS WOODLAND
  - CROP LAND (CULTIVATED)
  - DISTURBED/DEVELOPED
  - HAY LAND (FORAGE)
  - OPEN CANOPY DECIDUOUS WOODLAND
  - OPEN CANOPY MIXED WOODLAND
  - ROAD
  - TALL SHRUB GRASSLAND
  - TAME GRASSLAND
  - WETLAND
  - YARD SITE ACTIVE
  - <ALL OTHER VALUES>



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CLIENT  
 CITY OF SASKATOON

PROJECT  
 CHANGE PROJECT TO RICHARD ST. BARBE BAKER NATURAL AREA MANAGEMENT PLAN

TITLE  
**LAND COVER CLASSIFICATION**

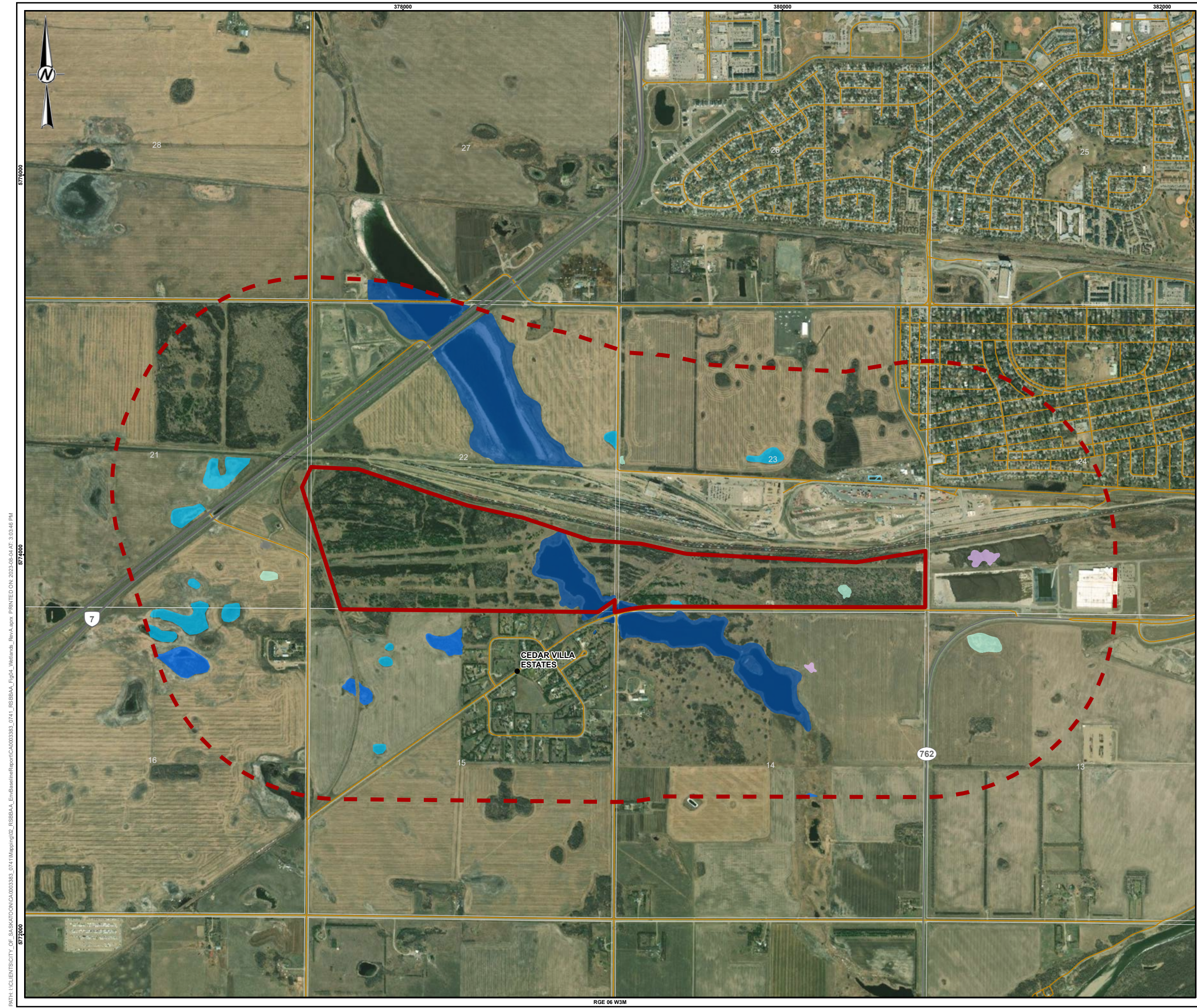
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	REVIEWED	
	APPROVED	

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**LEGEND**

	PROJECT STUDY AREA		CLASS I WETLAND
	LOCAL STUDY AREA		CLASS II WETLAND
	POPULATED PLACE		CLASS III WETLAND
	PRIMARY HIGHWAY		CLASS IV WETLAND
	SECONDARY HIGHWAY		CLASS V WETLAND
	LOCAL ROAD		ANTHROPOGENIC WETLAND
			<ALL OTHER VALUES>



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CLIENT  
 CITY OF SASKATOON

PROJECT  
 RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL PLAN

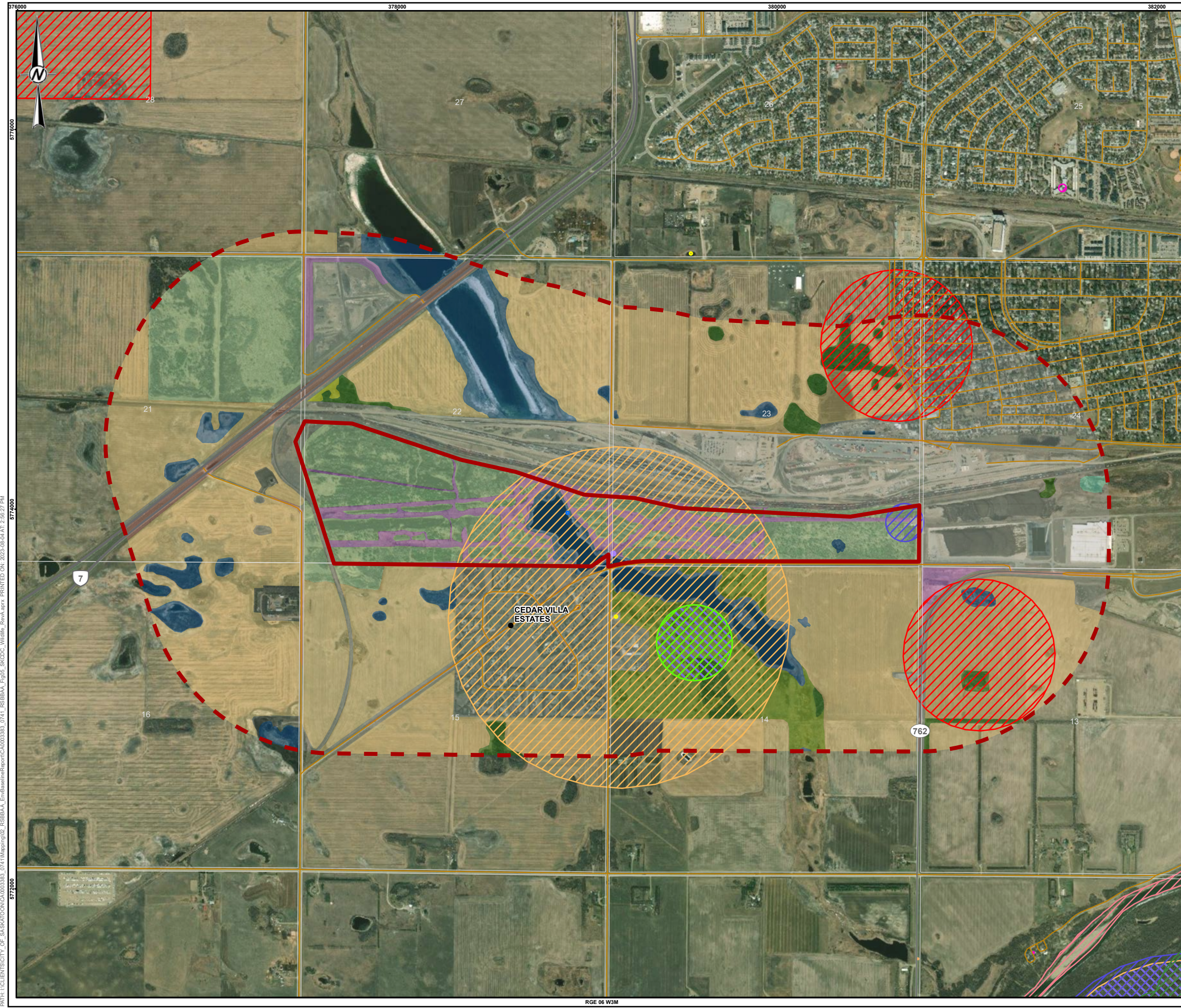
TITLE  
**WETLANDS CLASSIFICATION**

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	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
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**LEGEND**

- PROJECT STUDY AREA
- WILDLIFE LOCAL STUDY AREA
- POPULATED PLACE
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- LOCAL ROAD
- BANK SWALLOW
- BARN SWALLOW
- BOBOLINK
- COMMON NIGHTHAWK
- HORNED GREBE
- LESSER YELLOWLEGS
- LITTLE BROWN MYOTIS
- MIGRATORY BIRD CONCENTRATION SITE
- NORTHERN LEOPARD FROG
- TURKEY VULTURE
- WESTERN TIGER SALAMANDER
- WHOOPING CRANE

**LAND COVER**

- CLOSED CANOPY DECIDUOUS WOODLAND
- CROP LAND (CULTIVATED)
- DISTURBED/DEVELOPED
- HAY LAND (FORAGE)
- OPEN CANOPY DECIDUOUS WOODLAND
- OPEN CANOPY MIXED WOODLAND
- ROAD
- TALL SHRUB GRASSLAND
- TAME GRASSLAND
- WETLAND
- YARD SITE ACTIVE
- <ALL OTHER VALUES>



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CITY OF SASKATOON

**PROJECT**

RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL SUMMARY

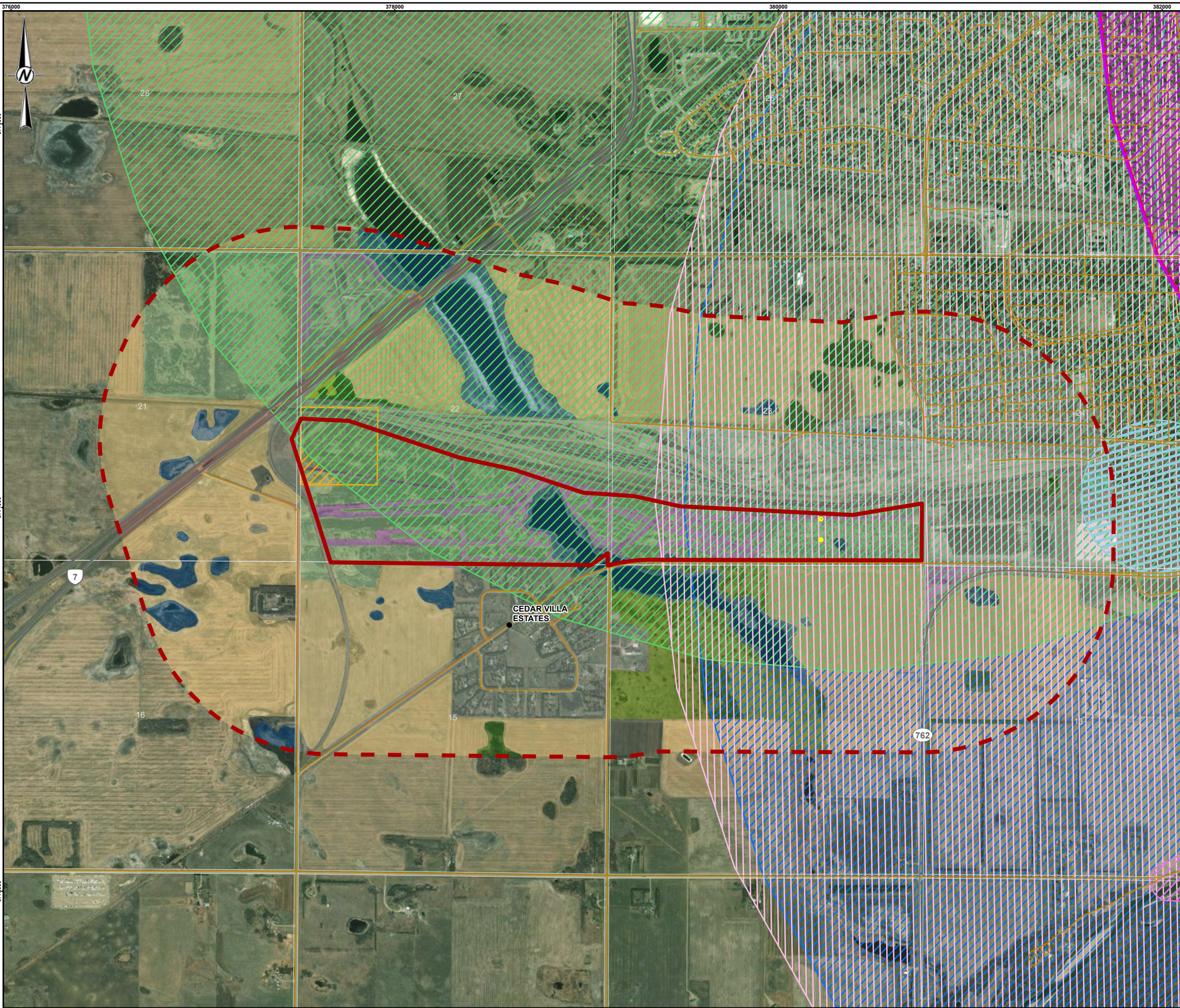
**TITLE**

SPECIES OF MANAGEMENT CONCERN (WILDLIFE)

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

PATH: I:\CLIENTS\CITY\_OF\_SASKATOON\CA0003383\_0741\MapInfo\02\_FRSBBA\_A\_EnvBaselineReport\CA0003383\_0741\_FRSBBA\_A\_Fig02\_SKCDC\_Wildlife\_Review.aprx PRINTED ON: 2023-08-04 AT: 2:56:27 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



**LEGEND**

- PROJECT STUDY AREA
- VEGETATION LOCAL STUDY AREA
- POPULATED PLACE
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- LOCAL ROAD
- BLUE WILD RYE
- CALIFORNIA AMARANTH
- HAIRY BUGSEED
- HOOKER'S BUGSEED
- NARROW-LEAVED WATER PLANTAIN
- RED-STEMMED CINQUEFOIL
- ROCKY MOUNTAIN SEDGE
- SMALL DROPSEED
- SMALL YELLOW LADY'S SLIPPER
- SMOOTH HAWK'S-BEARD
- SOFT WILD BERGAMOT

**LAND COVER**

- CLOSED CANOPY DECIDUOUS WOODLAND
- CROP LAND (CULTIVATED)
- DISTURBED/DEVELOPED
- HAY LAND (FORAGE)
- OPEN CANOPY DECIDUOUS WOODLAND
- OPEN CANOPY MIXED WOODLAND
- ROAD
- TALL SHRUB GRASSLAND
- TAME GRASSLAND
- WETLAND
- YARD SITE ACTIVE
- <ALL OTHER VALUES>



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CITY OF SASKATOON

**PROJECT**

RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL SUMMARY

**TITLE**

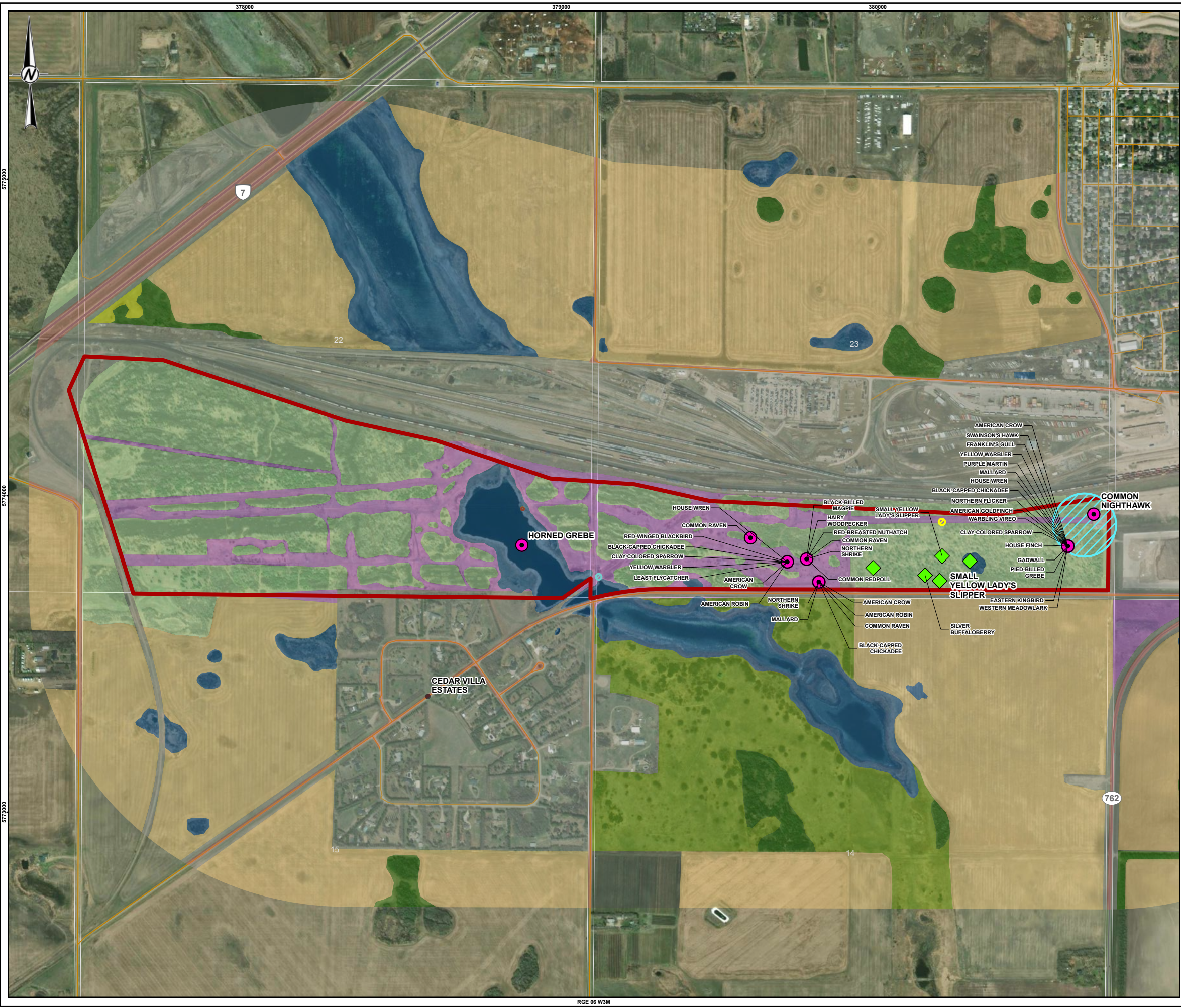
SPECIES OF MANAGEMENT CONCERN (VEGETATION)

CONSULTANT	YYYY-MM-DD	2023-08-04
DESIGNED		BN
PREPARED		LMS
REVIEWED		
APPROVED		

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- LEGEND**
- ▭ PROJECT STUDY AREA
  - POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
  - ▭ CLOSED CANOPY DECIDUOUS WOODLAND
  - ▭ CROP LAND (CULTIVATED)
  - ▭ DISTURBED/DEVELOPED
  - ▭ HAY LAND (FORAGE)
  - ▭ OPEN CANOPY MIXED WOODLAND
  - ▭ ROAD
  - ▭ TALL SHRUB GRASSLAND
  - ▭ TAME GRASSLAND
  - ▭ WETLAND
  - ▭ YARD SITE ACTIVE
  - ◆ SPECIES OF MANAGEMENT CONCERN - VEGETATION
  - SPECIES OF MANAGEMENT CONCERN - WILDLIFE
- HISTORICAL OBSERVATIONS (SKCDC)**
- ▭ BARN SWALLOW
  - ▭ COMMON NIGHTHAWK
  - ▭ LESSER YELLOWLEGS
  - ▭ WESTERN TIGER SALAMANDER
  - ▭ SMALL YELLOW LADY'S SLIPPER



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 CITY OF SASKATOON

PROJECT  
 RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL SUMMARY

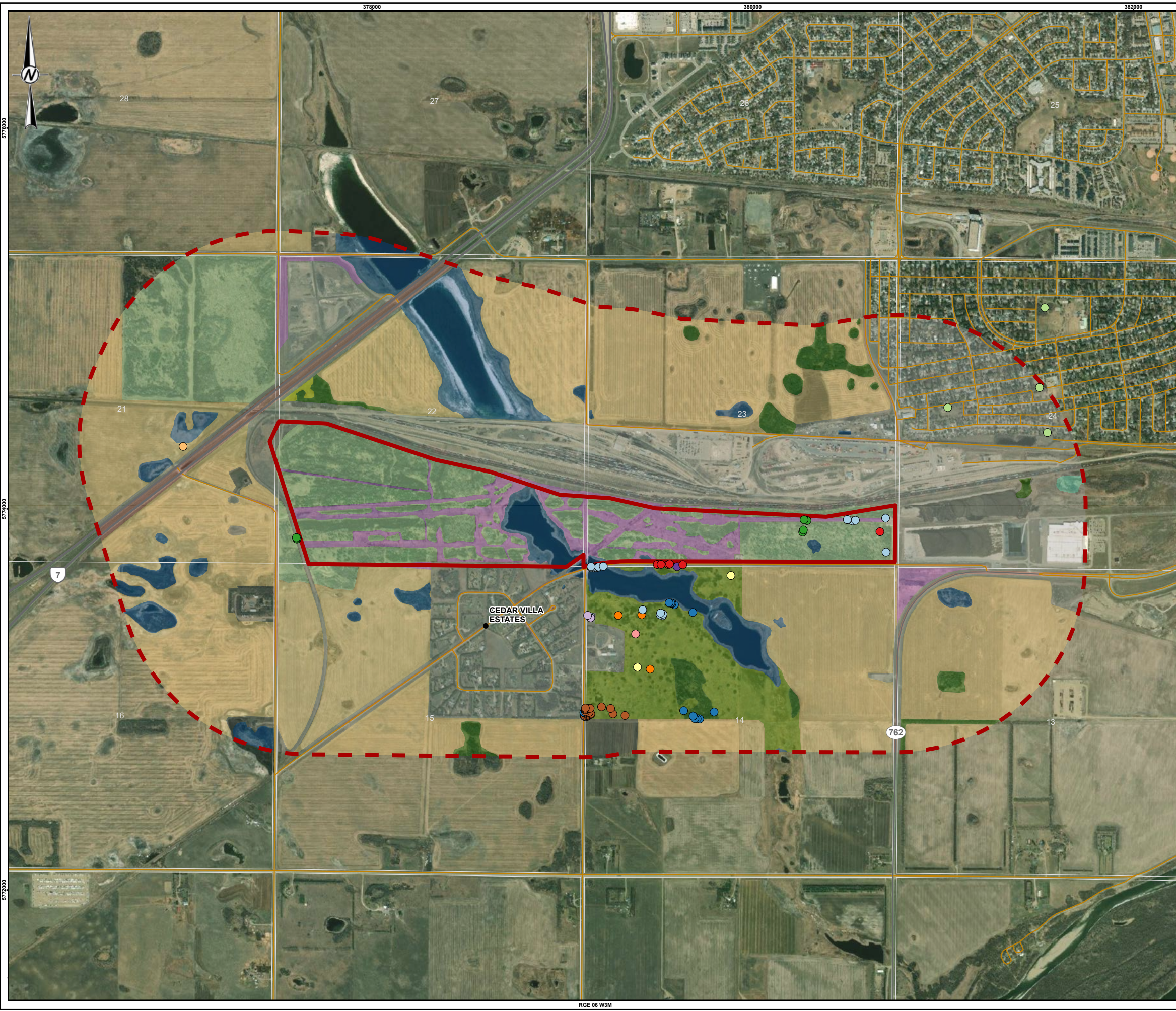
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CONSULTANT	YYYY-MM-DD	2023-08-04
DESIGNED	BN	
PREPARED	LMS	
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PATH: I:\CLIENTS\CITY\_OF\_SASKATCHEWAN\CA0003383\_0741\MapInfo\02\_ESEBBA\_A\_EnvBaselineReport\CA0003383\_0741\_ESEBBA\_A\_Fig07\_SONIC\_RevA.aprx PRINTED ON: 2023-08-04 AT: 2:52:22 PM

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- LEGEND**
- PROJECT STUDY AREA
  - VEGETATION LOCAL STUDY AREA
  - POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD

- NOXIOUS AND NUISANCE WEED**
- ABSINTHE
  - CLEMATIS
  - EUROPEAN BUCKTHORN
  - LEAFY SPURGE
  - MALTESE-CROSS CAMPION
  - OX-EYE DAISY
  - PURPLE LOOSESTRIFE
  - RUSSIAN OLIVE
  - SCENTLESS CHAMOMILE
  - SCOTCH PINE
  - SIBERIAN ELM
  - TALL BABY'S BREATH
  - TANSY
  - TARTARIAN HONEYSUCKLE

- LAND COVER**
- CLOSED CANOPY DECIDUOUS WOODLAND
  - CROP LAND (CULTIVATED)
  - DISTURBED/DEVELOPED
  - HAY LAND (FORAGE)
  - OPEN CANOPY DECIDUOUS WOODLAND
  - OPEN CANOPY MIXED WOODLAND
  - ROAD
  - TALL SHRUB GRASSLAND
  - TAME GRASSLAND
  - WETLAND
  - YARD SITE ACTIVE
  - <ALL OTHER VALUES>



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CITY OF SASKATOON

PROJECT  
RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL PLAN

TITLE  
NOXIOUS AND NUISANCE WEEDS

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

PROJECT NO. CONTROL REV. FIGURE  
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- LEGEND:**
- SITE BOUNDARY
  - EXISTING CONTOUR (0.5M INTERVAL)
  - EXISTING EASEMENT/ROW
  - ||||| EXISTING RAIL LINE
  - EXISTING TRAIL
  - EXISTING EXTERNAL TRAIL
  - EXISTING FENCE
  - EXISTING DOG PARK FENCE
  - X EXISTING GATE
  - ||||| EXISTING BENCH
  - EXISTING BIRD FEEDERS
  - △ EXISTING BIRD HOUSE
  - / EXISTING SIGN
  - EXISTING WASTE RECEPTACLE
  - EXISTING SKILLS PARK BOUNDARY
  - ▲ EXISTING ACCESS ROUTE



CONSULTANT:



CLIENT:



PROJECT TITLE:

**RICHARD ST. BARBE BAKER  
AFFORESTATION AREA**  
SASKATOON, SASKATCHEWAN

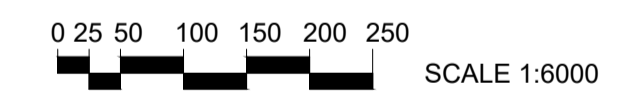
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**HUMAN USE &  
CONTEXT PLAN**

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 C:\Users\lucy@wsp\OneDrive\Work\Projects\Richard St. Barbe Baker Afforestation Area - Project Files\05. Technical\03. Landscape Architecture\01. Concept Design\05. Parks\BB-Baker\CONCEPT PLAN.dwg



- LEGEND:
- - - SITE BOUNDARY
  - - - EXISTING CONTOUR (0.5M INTERVAL)
  - MANAGEMENT ZONE 1: ECOLOGICAL CORE ZONE
  - MANAGEMENT ZONE 2: PROGRAMMABLE ZONE
  - MANAGEMENT ZONE 3: UTILITY CORRIDOR ZONE



CONSULTANT:



CLIENT:



PROJECT TITLE:

**RICHARD ST. BARBE BAKER  
AFFORESTATION AREA**  
SASKATOON, SASKATCHEWAN

DRAWING TITLE:

**MANAGEMENT ZONES**

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# APPENDIX

## **B** BIOPHYSICAL BASELINE ENVIRONMENTAL SUMMARY

CITY OF SASKATOON  
23-0124

# RICHARD ST. BARBE BAKER AFFORESTATION AREA BIOPHYSICAL BASELINE SUMMARY

December 22, 2023

PUBLIC





# RICHARD ST. BARBE BAKER AFFORESTATION AREA

## BIOPHYSICAL BASELINE SUMMARY

CITY OF SASKATOON

PUBLIC

PROJECT NO.: CA0003383.0741

CLIENT REF:23-0124

DATE: AUGUST 18, 2023

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UNIT 175  
1810 8 STREET EAST  
SASKATOON, SK, CANADA S7H 0T6

T: +1 306 955-1610

F: +1 204 474-2864

WSP.COM



August 18, 2023

Public

CITY OF SASKATOON  
City of Saskatoon  
222 3rd Avenue North  
Saskatoon, SK S7K 0J5

**Attention: Jessie Best, Project Manager**

Dear Madam/Sir:

**Subject: Biophysical Baseline Summaries for the Richard St. Barbe Baker  
Afforestation Area NAMP**

**Client ref.: 23-0124**

**Client ref.: 23-0124**

WSP Canada Inc. (WSP) has prepared this biophysical baseline environmental summary (BBES) report to support our strategy for the future management of the Richard St. Barbe Baker Afforestation Area (RSBBAA; the Project).

This BBES report will provide a foundational understanding of the biophysical baseline when outlining the steps required to protect, restore, and manage the Project. This work is part of the implementation of “Pathways for an Integrated Green Network: An Implementation Plan for Saskatoon’s Green Infrastructure Strategy.” The BBES report presents the findings of a thorough literature review, environmental screening, and site visit to confirm review findings for the proposed Project.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'MO', with a long horizontal flourish extending to the right.

Marc Obert, B.Sc., PBIOL.  
Senior Environmental Planner

MO/jr/pr

WSP ref.: CA0003383.0741

UNIT 175  
1810 8 STREET EAST  
SASKATOON, SK, CANADA S7H 0T6

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F: +1 204 474-2864  
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# SIGNATURES

## PREPARED BY

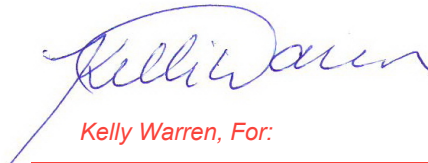


Andrea Buhler, B.Sc., AAg  
Intermediate, Vegetation Ecologist, Ecology &  
Environmental Impact Assessment

## REVIEWED BY



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Senior, Biologist, Ecology & Environmental  
Impact Assessment

## APPROVED BY



Marc Obert, B.Sc., PBIOL.  
Senior, Environmental Planner, Ecology &  
Environmental Impact Assessment

December 22, 2023

Date

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Senior, Environmental Planner	Marc Obert, B.Sc., PBIol
Experienced GIS Analyst	Lisa Stuart
Biologist	Alyssa Reimer, B. Env Stu., BIT
GIS Analyst	Scott Gordon



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- C** HABITAT TYPE DESCRIPTIONS
- D** OBSERVED VEGETATION IN THE RSBBA
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- F** OBSERVED WILDLIFE SPECIES

# 1 INTRODUCTION

WSP Canada Inc. (WSP) has been retained by the City of Saskatoon (the City) to assist in developing a Natural Area Management Plan (NAMP) for the Richard St. Barbe Baker Afforestation Area (RSBBAA; the Project). This baseline summary will be used to support the NAMP that will outline the steps required to protect, restore, and manage the Project. This work is part of the implementation of “Pathways for an Integrated Green Network: an Implementation Plan for Saskatoon’s Green Infrastructure Strategy.” This report presents the findings of a thorough literature and desktop review, environmental and heritage desktop screening, and a general site visit to initially confirm review findings for the proposed Project.

## 1.1 PROJECT LOCATION

The Project is located on the south edge of the City within the Canadian National Railway (CN) Yards Management Area. It is situated between Saskatchewan Highway 7 and Circle Drive South. The CN Yards borders the RSBBAA to the north; and residential neighbourhoods, Montgomery Place and Cedar Villa Estates, are located northeast and south (Appendix A, Figure 1).

The Project spans three quarter sections, including:

- SE-22-36-06-W3M
- S ½ -23-36-06-W3M

The RSBBAA area has been identified as containing some of the city’s largest Natural Asset Patches (Meewasin Valley Authority 2019). The natural features found within the RSBBAA align with the Post-Glacial Channel Scar Conservation Target detailed in the Meewasin Valley-wide Resource Management Plan (Meewasin Valley Authority, 2017).

### 1.1.1 STUDY AREAS

The spatial boundaries for the Project have been defined as the Project Study Area (PSA), Local Study Area (LSA), and Regional Study Area (RSA). These areas were used to assess the Project boundaries and potential interactions with the surrounding environment. Each area is defined as follows:

**Project Study Area:** Direct area of study defined by the City. The PSA covers approximately 133 ha.

**Local Study Area:** The LSA includes the PSA plus a 1 km buffer. The 1 km buffer is defined to encompass the minimum setback distances for Sensitive Species (Ministry of Environment, 2017) and Species of Management Concern (SOMC).

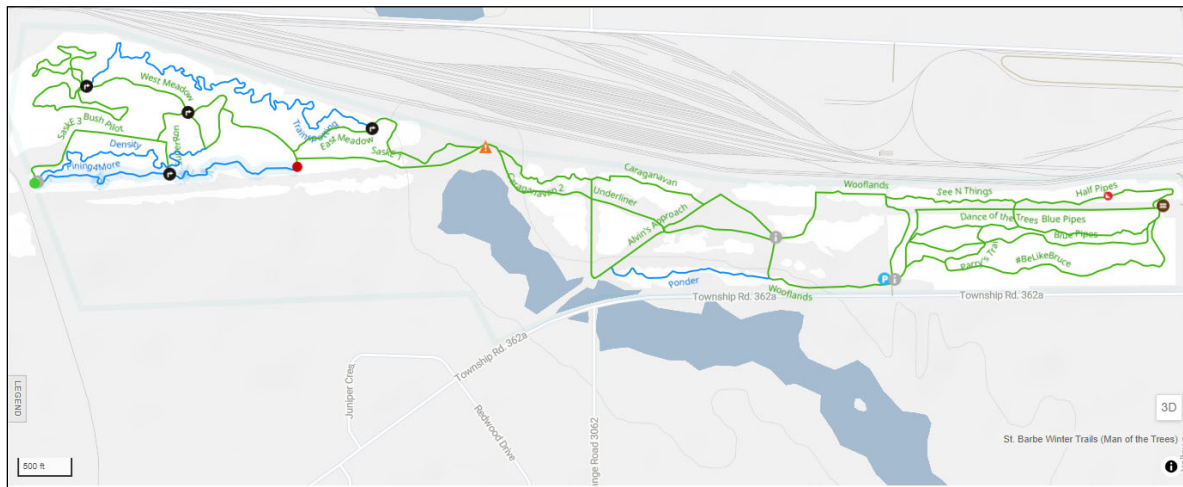
**Regional Study Area:** The RSA includes the PSA plus a 5 km buffer. The 5 km buffer is defined to encompass potential environmental constraints (SOMC).

## 1.2 PROJECT LOCATION, OVERVIEW AND CURRENT USE

The RSBBAA is a green space within the City planted by the Parks Division in 1971. This treed area has closed and open canopy sections, as well as a mixture of wetlands. The trees and shrubs within RSBBAA contain both planted, horticultural species, and naturally established flora, species native to both Saskatchewan and the City. It is understood that the goal surrounding the creation of this green space was to “improve the future environment of the city” (City of Saskatoon, 2019). The RSBBAA currently provides passive recreation opportunities for local residents of the neighbourhood and the greater city, a space that is considered valuable in terms of natural resources, with easy access to nature, of which residents can take pride in and enjoy (City of Saskatoon, 2019).

As noted, the RSBBAA provides areas for passive recreation (walking, winter biking, off-leash dog use) and ecological educational opportunities. A trail system currently maintained by the Friends of the Saskatoon Afforestation Areas and the Flatlanders Fat Tire Brigade (Tourism Saskatchewan, n.d.) year-round for biking, hiking, and trail running (**Image 1**). The trail system includes 24 trails for mountain biking or fat biking and 22 trails

for hiking or trail running. Associated infrastructure along these trails includes signage, trailhead maps, park benches, and a gravel parking lot located along Range Road 362. The trail system overlaps with the Southwest Dog Park, which is an off-leash recreational area located on Parcel C and covers approximately 5.8 ha of the RSBBA.



**Image 1: Network of city-maintained Trails. Source – Trailforks, St Barbe Winter Trails (Man of the Trees) (<https://www.trailforks.com/region/st-barbe-winter-trails-man-of-the-trees/?activitytype=6>)**

Additionally, a utility management area is located on the eastern border, and three power lines run through the PSA with maintained Right of Way (ROW) absent of tall shrubs or trees.

RSBBAA is currently part of Meewasin’s Valley-wide Resource Management Area (City of Saskatoon, 2018). Over the past 15 years, land within the Meewasin Valley jurisdiction, including a 2 km buffer, has experienced a loss of almost 3% of potential or existing habitat (Meewasin Valley Authority, 2017).

## 2 METHODS

### 2.1 LITERATURE AND DESKTOP REVIEW

A detailed review of available studies, literature, and assessments relevant to the Project was completed in June 2023. Key reports for the RSBBA or adjacent areas were reviewed in detail and included:

- Blairmore Natural Areas Screening Final Report (EDI Environmental Dynamics, 2022).
- Montgomery Place Local Area Plan Final Report (City of Saskatoon, 2018).
- Meewasin Valley-wide Resource Management Plan (Meewasin Valley Authority, 2017).
- Natural Areas Inventory for the City of Saskatoon, 2019 (Meewasin Valley Authority, 2019).
- Natural Asset Inventory Dashboard, 2021 (Green Analytics, 2021).

The complete list of literature supplied by the City and reviewed for the Project is included in Section 7 (Bibliography).

A desktop review was also completed to verify and update any existing information found through the literature review. The following reports and databases that were reviewed for the Project include:

- The Ecoregions of Saskatchewan (Acton, et al., 1998).
- Saskatchewan Soil Information System (SKSIS) (SKSIS Working Group, 2018).
- Saskatchewan Land Resource Units (SLRU) (Agriculture and Agri-Food Canada, 2004; 2009).
- Classification of Natural Ponds and Lakes in the Glaciated Prairie Region (Stewart and Kantrud, 1971).



- A screening of previously documented plant and wildlife SOMC that have potential to occur within the PSA and RSA using the Hunting, Angling, and Biodiversity Information of Saskatchewan (HABISask) online mapping application (SKCDC, 2023a).
- Saskatchewan Conservation Data Centre (SKCDC) tracked species lists that include information from federal and provincial status documents, provincial tracking lists, literature, modelling, and recorded distributions (SKCDC, 2023b, c). All species occurrences were cross-referenced with provincial (SKCDC, 2023b, c) and federal (Government of Canada, 2022) status lists to determine if listed species have been observed or recorded as occurring within the LSA and RSA.
- A review of reported occurrences of weed species identified under Saskatchewan’s *Weed Control Act* (2010), using the iMapInvasives (NatureServe, 2022) database, was completed within the LSA.
- Publicly available imagery.

## 2.2 HABITAT MAPPING

Available world imagery from ESRI™ Basemap Service Layer was used to map the land cover types within the LSA. GoogleEarth™ imagery from various months in the years 2012, 2015, 2017, 2020, 2021, and 2022 was used at various scales to review historical conditions in the LSA to supplement available data (primarily for wetland mapping).

Habitat polygons were manually delineated in the LSA using the ArcGIS mapping platform. Habitat types selected for the Project were those identified in the Blairmore Natural Areas Screening Report (EDI Environmental Dynamics, 2022). Habitat classes defined in the Meewasin Natural Areas Inventory for the City of Saskatoon (2019) were used to further refine or classify the LSA.

Vegetation information collected from the 2023 site visit was used to refine vegetation mapping as necessary.

For ease of review, the various habitat types were grouped by the categories listed in the Blairmore Natural Areas Screening Report (EDI, 2022) and the Meewasin Natural Areas Inventory for the City of Saskatoon (2019).

## 2.3 SITE VISIT

WSP ecologists conducted a general field visit on June 14, 2023, to refine any knowledge gaps (Section 4) that arose during the desktop review, as well, as to confirm findings and record incidental species observations that may have previously gone unrecorded. Data collected included, but was not limited to landcover and wetland mapping refinement; and site-specific descriptive information on habitats present in the PSA.

During the site reconnaissance, incidental wildlife and vegetation species observations of mammals, waterfowl, and noxious or nuisance weeds were recorded. The observations made are incorporated into the summaries provided in Appendix D and F.

## 2.4 SPECIES OF MANAGEMENT CONCERN

For the purposes of this report, SOMC are defined as flora or fauna species that meet any of the following criteria: tracked provincially by the Saskatchewan Conservation Data Centre (SKCDC); species protected by the Saskatchewan *Wildlife Act* and *Regulations*; designated by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered, Threatened, or Special Concern; federally protected under Schedule 1 of the *Species at Risk Act (SARA)*; and/or all other sensitive species and guilds included in the Saskatchewan Activity Restriction Guidelines (ARG) for Sensitive Species (MEnv, 2017). SOMC may require specific mitigation measures studies, or conservation to enable the Project to proceed.

Once all available data has been synthesized, important flora and fauna will be identified, and a probability of being present within the PSA will be assigned based on the following:

- Low: habitat requirements not met, low population and isolated populations exist, not previously documented in PSA, and/or species is highly selective.
- Medium: species detection difficult, habitat requirements may be met, or species is a habitat generalist.
- High: habitat requirements met, habitat generalists, and/or indicator species present.

# 3 RESULTS

Results from the environmental review are a combination of literature and desktop reviews, supplemented with data collected during the site visit. Information collected during the site visit intended to bridge any knowledge gaps that arose during the reviews, as well, as to confirm findings and record incidental species observations that may have previously gone unrecorded. Photo documentation taken during the field assessment of habitat types and other biophysical features are included in Appendix B.

## 3.1 ECOLOGICAL CONTEXT

The following Sections outline key biophysical criteria critical for inclusion into the NAMP.

### 3.1.1 BASELINE INFORMATION SUMMARY

The Project occurs within the Saskatoon Plain (K08) Ecodistrict of the Moist Mixed Grassland Ecoregion within the Prairie Ecozone (Acton et al., 1998). The Moist Mixed Grassland is considered a subhumid climate, less arid than its neighbouring Mixed Grassland Ecoregion to the south but warmer and drier than the Aspen Parkland Ecoregion to the north. On average, this ecoregion receives approximately 383 mm of precipitation annually, with 240 mm of that precipitation occurring during the growing season (May through September). The annual average temperature is 2.4°C (Acton et al., 1998).

The landscape of the Moist Mixed Grassland is dotted with undrained depressions due to the land formation by glacial till. The dominant tree species in the Moist Mixed Grassland is trembling aspen (*Populus tremuloides*), which is commonly found in groves surrounding the various depression wetlands (Acton, et al., 1998).

Within the City, the Project falls within the CN Yards Management Area, which is comprised of 57.2 ha of grasslands, 86.6 ha of forest/shrubland and 11.5 ha of wetlands. According to Green Analytics (2021), much of this area was confirmed to be in fair condition based on four condition categories: Surface Permeability, Adjacent Land Use, Road Density, and Relative Asset Size.

### 3.1.2 ECOLOGICAL PROCESSES, NATURAL DISTURBANCES, AND HAZARDS

The RSBBA is a landscape located in the southwest part of Saskatoon, consisting of wetlands, native grasslands, and reforested areas (City of Saskatoon, 2020). It is an integral part of the green network of the City of Saskatoon (City of Saskatoon, 2022), which acts as a corridor for wildlife to move through the landscape (Meewasin, 2017) and provides ecosystems services such as carbon sequestration, supporting global climate control (City of Saskatoon, 2020), and local flood mitigation. With extreme weather events becoming more frequent, the various wetlands present will attenuate water during heavy rainfall events and during spring snowmelt (City of Saskatoon, 2020).

Other potential hazards exist from the Canadian National Railway Rail Yard Management site and adjacent commercial areas operations (e.g., Queen Elizabeth Power Station, Agpro Industrial and South West Industrial). There is a high chance of soil contamination through spills of hazardous substances (EDI, 2022).

It is also understood that a disposal/dumping site owned by CN is present on the western edge of the PSA, increasing the risk of introducing further dangerous materials like solvents, hydrocarbons, or batteries to the RSBBA (EDI, 2022).

Road construction, power line installation, urban development, and the establishment of a facility management area have had a significant impact on the distribution and health of the current vegetative assemblages present. As these human-caused changes intensify along the perimeter, the RSBBA will be under continued pressure from the anthropogenic impacts (e.g., increase or decreases in supporting surface water run on/off, undesirable species introductions etc.) these activities may represent. There is also a potential that the RSBBA be compromised in size to make room for further development, or the ecological connectivity will be endangered as development progresses (EDI, 2022). The surrounding matrix might become impenetrable for wildlife, isolating this valued natural area and

limiting the suggested linkages identified in the Integrated Green Network Plan that was put forward by the City of Saskatoon in 2022.

Recreation activities and changes to the climate can lead to the introduce undesirables to the PSA or enhance their distribution within the PSA (Liedtke et al., 2020; City of Saskatoon, 2019). For example, shoes and bikes that have not been cleaned properly between usage have a chance of carrying propagules of invasive plants. These hitchhikers are carried around until they loosen from the boot/tire and start a new population at a given location (Leave No Trace Center of Outdoor Ethics, 2021). Such introductions will threaten the native and modified species composition present in the RSBBA.

Uninformed urban development within a known wetland catchment usually results in a loss or increase to the receiving waters, which can significantly change their natural hydroperiod leading to the drying out or constant flooding of a wetland. This intern would impact wetland health and erode wetland function and could lead to a change in overall wetland classification if the hydrological inputs are not carefully managed (Native Plant Solutions, 2023).

### 3.1.3 ASSET INVENTORY AND ECOLOGICAL SERVICES

The habitat types mapped for the LSA are presented on Figure 2 (Appendix A). Habitat type definitions are provided in Appendix C. Based on the information reviewed, the PSA consists of 86.0 ha of Open Canopy Mixed Woodland (64.8%), 33.5 ha of Tame Grassland (25.2%) and 9.9 ha of Wetland (7.4%) Land Cover. Small areas of Disturbed/Developed make up 3.3 ha (2.5%) of the PSA (Table 3-1).

Categories, Subcategories and Secondary Subcategories were classified using the Natural Areas Inventory (NAI) for the City of Saskatoon prepared by the Meewasin Valley Authority (2019).

**Table 3-1 Land Cover in the Project and Local Study Area**

CATEGORY <sup>1</sup>	HABITAT TYPE	SUBCATEGORY	SECONDARY SUBCATEGORY	PSA AREA (ha)	PERCENTAGE	LSA AREA (ha)	PERCENTAGE
<b>Agricultural Lands</b>	Crop Land (Cultivated)	Crop Land	n/a	-	-	457.8	38.3
	Hay Land (Forage)	Tame Forage	n/a	-	-	0.8	0.1
<b>Naturalized Assets</b>	Tame Grassland	Grassland Systems	Naturalized	33.5	25.3	44.2	3.7
	Tall Shrub Grassland	Forested and Shrubland Systems	Native and Naturalized	-	-	51.4	4.3
	Open Canopy Deciduous Woodland	Forested and Shrubland Systems	Afforested	-	-	1.1	0.1
	Closed Canopy Deciduous Woodland	Forested and Shrubland Systems	Afforested	-	-	21.8	1.8
	Open Canopy Mixed Woodland	Forested and Shrubland Systems	Afforested	86.0	64.8	153.7	12.9
	Wetland	Aquatic Systems	Wetland	9.9	7.4	86.9	7.3
<b>n/a</b>	Disturbed/Developed	n/a	n/a	3.3	2.5	333.0	27.9
	Road	n/a	n/a	-	-	30.8	2.6
	Yard Site	n/a	n/a	-	-	13.1	1.1
<b>Total</b>				<b>132.7</b>		<b>1194.6</b>	

Notes: 1 N/A denotes habitat types not categorized in the Meewasin 2019 Natural Areas Inventory for the City of Saskatoon.

- = Habitat Type was not present.

### 3.1.4 TOPOGRAPHY AND SOILS

The Moist Mixed Grassland Ecoregion is dominated by Dark Brown Chernozemic soils (Acton, et al., 1998). The terrain in the general location of the Project is characterized by gently undulating till plains.

According to the Blairmore Natural Areas Screening Report (EDI, 2022), four different soil associations and six soil map units were identified within the PSA. EDI (2022) observed that the PSA was predominately covered by the Bradwell (Br) soil associations, with smaller portions covered by Asquith (Aq) and Meadow (Mw).

To confirm and refine our understanding of site-specific soil and terrain conditions, information for soil association distribution and soil characteristics within the PSA was obtained through the SKSIS (2018) and the SLRU (Agriculture and Agri-food Canada, 2004; 2009). The review of SKSIS and the SLRU provided digital soil resource information and was used to identify dominant soil types, texture, salinity, erosion potentials, landform/surface expression, and slope classes. Agricultural capability of soils is used to describe the limitations of soils as a result of climate, and landscape (SKSIS, 2018). Refer to Table 3-2 and Figure 3; Appendix A for a detailed summary of the additional soil information reviewed.

**Table 3-2 Soil Map Units and Associated Soil Characteristics within the Project Study Area**

MAP UNIT	SOIL ASSOCIATION/ COMPLEX	PARENT MATERIAL	DOMINANT/ SUBDOMINANT SOILS	DOMINANT SURFACE TEXTURE	SURFACE EXPRESSION	SLOPE CLASS	SALINITY	AGRICULTURE CAPABILITY
Aq 1	Asquith	Fluvial	Dark Brown Chernozem	Sandy Loam	Undulating	3 (2-5%)	0	5(10)M
Aq3	Asquith	Fluvial	Dark Brown Chernozem	Sandy Loam	Hummocky	3 (2-5%)	3	4(10)M
Br3	Bradwell	Lacustrine	Dark Brown Chernozem	Loam	Undulating	3 (2-5%)	1	3(10)M
Mw2	Meadow	Alluvial	Rego Humic Gleysol	Sandy Loam	Level	1 (0-0.5%)	6	6(10)WM
AqBr 1	Asquith-Bradwell	Fluvial/ Lacustrine	Dark Brown Chernozem	Very Fine Sandy Clay Loam	Undulating	3 (2-5%)	0	4(6)M / 3(4)M

Source: SKSIS 2018, SLRU 2004;2009

Notes: Agricultural Capability; 3 = moderately severe limitations, 4 = severe limitations restricting range of crops, 5 = severe limitations restricting their use to the production of native or tame species of perennial forage, 6 = capable of producing native forage crops; M = insufficient soil water-holding capacity, W = limitation due to excess water caused by either poor soil drainage, a high groundwater table or to seepage and runoff.

The Blairmore Natural Area Screening Report identified 13 areas of potential or confirmed soil contamination locations; however, none were present within the PSA. The closest identified area is the CN Yards Management area, which is directly adjacent to the northern boundary of the RSBBA. The main potential contaminants of concern identified were hydrocarbons, polycyclic aromatic hydrocarbons, benzene, toluene, ethylbenzene, xylene, metals, glycols, and solvents (EDI, 2022).

### 3.1.5 VEGETATION

In addition to reviewing the Blairmore Natural Areas Screening Report (EDI, 2022), additional desktop screenings were undertaken to identify previous occurrences of plant SOMC. As the SKCDC is routinely updated, a review of this database for historical plant SOMC with potential to occur within the LSA was completed, as well as a review of the “Tracked Vascular Plant Species by Ecoregion” found within the Saskatoon Plain to determine potential habitat for SOMC and SARA-listed species. Lastly, a review of reported occurrences of weed species identified under the Saskatchewan *Weed Control Act* (2010) using the iMapInvasives (iMapInvasives, 2022) platform was completed for the LSA. A full list of species identified from all sources is summarized in Appendix D.

Based on the documentation reviewed, the RSBBA is comprised of dense woody vegetation, including common caragana (*Caragana arborens*), Siberian elm (*Ulmus pumila*), Manitoba maple (*Acer negundo*), and green ash

(*Fraxinus pennsylvanica*) among others. Many invasive species dominate the understory of the RSBBA, including smooth brome (*Bromus inermis*), quack grass (*Elymus repens*), and crested wheatgrass (*Agropyron cristatum ssp. pectinatum*) (EDI 2022).

During the forested range health assessments completed by EDI (2022), it was observed that some native species have naturalized around native aspen (*Populus tremuloides*) groves within the PSA. However, the rangeland health of the RSBBA was determined to be poor due to shrubby encroachment of non-native species (e.g., common caragana, European buckthorn [*Rhamnus cathartica*]).

The 2023 general site visit did not document any additional species of note. A full list of species identified by EDI (2021) is summarized in Appendix D.

### 3.1.5.1 NOXIOUS AND NUISANCE WEEDS

EDI (2022) documented 16 weed species (summarized in Table 3-3). Of the 16 identified, three are designated as Nuisance, and 14 as Noxious under the *Weed Control Act* (2010). Weeds were found to mainly occur within the present utility ROW; however, sporadic occurrences were noted throughout the entire PSA. In addition to the noted Nuisance and Noxious species, EDI (2022) observed that common caragana is quite common in select areas throughout the RSBAA. Although it is not listed under the *Weed Control Act*, it is an introduced species with aggressive spreading tendencies, often out-competing local native vegetation (Manitoba Master Gardner Association, 2023).

**Table 3-3 Nuisance and Noxious Weed Occurrences Recorded in the Project Study Area by EDI (2022)**

COMMON NAME	SCIENTIFIC NAME	WEED CONTROL ACT (2010) DESIGNATION <sup>1</sup>
absinthe	<i>Artemisia absinthium</i>	Noxious
blue lettuce	<i>Latua tatarica</i>	Noxious
Canada thistle	<i>Cirsium arvense</i>	Noxious
common dandelion	<i>Taraxacum officinale</i>	Nuisance
common tansy	<i>Tanacetum vulgare</i>	Noxious
European buckthorn	<i>Rhamnus cathartica</i>	Noxious
field sow-thistle	<i>Sonchus arvensis ssp. arvensis</i>	Noxious
foxtail barley	<i>Hordeum jubatum</i>	Noxious
leafy spurge	<i>Euphorbia esula</i>	Noxious
meadow goats beard	<i>Tragopogon dubuis</i>	Nuisance
narrow-leaved hawksbeard	<i>Crepis tectorum</i>	Noxious
nodding thistle	<i>Carduus nutans ssp. leiophyllus</i>	Noxious
oxeye daisy	<i>Leucanthemum vulgare</i>	Noxious
quack grass	<i>Elymus repens</i>	Nuisance
scentless chamomile	<i>Tripleurospermum inodorum</i>	Noxious
baby's breath	<i>Gypsophila paniculata</i>	Noxious

Source: EDI, 2022

Notes:

<sup>1</sup> Weed species are defined as Prohibited under Schedule I, Noxious under Schedule II and Nuisance under Schedule III of the *Weed Control Act* (2010).

“Nuisance weed” means any plant that is designated by order of the minister as a nuisance weed and includes the seeds or any other part of that plant that may grow to produce another plant.

“Noxious weed” means any plant that is designated by order of the minister as a noxious weed and includes the seeds or any other part of that plant that may grow to produce another plant.

The iMapInvasives platform was used to verify and update the findings of the EDI 2022 report. However, the area assessed was broadened to the LSA extent to capture areas that extended outside of the PSA due to the developed nature of the surrounding area (e.g., developed areas, roads, and cultivated areas). The review of iMapInvasives conducted in June 2023 confirmed 139 individual weed occurrences within the LSA. Additional species that were not recorded in the EDI 2022 report (Figure 8) are summarized in Table 3.1-4.

No weeds listed as Prohibited under the *Weed Control Act (2010)* were noted.

**Table 3-4 Nuisance and Noxious Weed Occurrences Recorded in the Local Study Area from iMapInvasives**

SCIENTIFIC NAME	SCIENTIFIC NAME	WEED CONTROL ACT (2010) DESIGNATION <sup>1</sup>	LAST RECORDED DATE OF OBSERVATION
baby's breath	<i>Gypsophila paniculata</i>	Noxious	2021
purple loosestrife	<i>Lythrum salicaria</i>	Noxious	2017
yellow toad-flax	<i>Linaria vulgaris</i>	Noxious	2020

Notes:

<sup>1</sup> Weed species are defined as Prohibited under Schedule I, Noxious under Schedule II and Nuisance under Schedule III of the Weed Control Act (2010).

During the general site visit conducted in June 2023, weeds (i.e., field sow-thistle, nodding thistle and quack grass) were noted mainly within utility ROW.

### 3.1.5.2 SPECIES OF MANAGEMENT CONCERN

To facilitate an initial understanding of potential flora SOMC within the PSA, a staged review of available information as it pertains to the RSA, LSA, and then PSA was completed.

According to the SKCDC, 22 plant SOMC have the potential to occur within the RSA. Of the plant SOMC identified within the RSA, three species, blue wild rye (*Elymus glaucus ssp. glaucus*), bristle-leaved sedge (*Carex eburnean*), and mucronate blue-eyed-grass (*Sisyrinchium mucronatum*) have a high likelihood to be found within the PSA based on known habitat requirements. SOMC within the RSA and the likelihood of occurrence within the PSA are in Table 3-5.

**Table 3-5 Plant Species of Management Concern Identified Within Regional Study Area and Their Potential to Occur in the Project Study Area**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	PREFERRED HABITAT <sup>(b)</sup>	CORRELATING HABITAT SUBCATEGORY	LIKELIHOOD TO OCCUR WITHIN THE PSA
American bugseed	<i>Corispermum americanum var. americanum</i>	S3	Sandy shores and prairies, sand dunes, disturbed roadsides and old fields.	Aquatic Systems Grassland Systems	Low
blue wild rye	<i>Elymus glaucus ssp. glaucus</i>	S3	Thickets and open woods	Forested and Shrubland Systems	High
bristle-leaved sedge	<i>Carex eburnean</i>	S3	Woodlands or shrublands	Forested and Shrubland Systems	High
bristly gooseberry	<i>Ribes oxycanthoides var. setosum</i>	S2	Moist woods, thickets, and rocky hillsides	Forested and Shrubland Systems	Medium
bushy cinquefoil	<i>Potentilla supina ssp. paradoxa</i>	S3	Riparian areas, sand dunes	Aquatic Systems	Low
California amaranth	<i>Amaranthus californicus</i>	S2	Moist flats and shores of waterbodies, disturbed habitats	Aquatic Systems	Medium
Columbia needlegrass	<i>Achnatherum nelsonii ssp. dorei</i>	S3	Dry plains, meadows, and open woods	Grassland Systems Forested and Shrubland Systems	Low
hairy bugseed	<i>Corispermum villosum</i>	S2	Sand dunes, sandy and gravelly shores, and waste places	Grasslands	Low

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	PREFERRED HABITAT <sup>(b)</sup>	CORRELATING HABITAT SUBCATEGORY	LIKELIHOOD TO OCCUR WITHIN THE PSA
hooker's bugseed	<i>Corispermum hookeri</i> var. <i>hookeri</i>	S2	Sandy and gravelly shores of rivers and streams, sand dunes, and waste places.	Aquatic Systems Grasslands	Low
mucronate blue-eyed-grass	<i>Sisyrinchium mucronatum</i>	S3	Moist meadows prairies and parklands	Forested and Shrubland Systems	High
narrow-leaved water plantain	<i>Alisma gramineum</i>	S3	Wet, sandy shores	Aquatic Systems	Medium
pale bulrush	<i>Scirpus pallidus</i>	S3	Marshy shores, and in moist ravine bottoms, low meadows, and ditches	Aquatic Systems Grasslands	Medium
pallas' bugseed	<i>Corispermum pallasii</i>	S2	Sand dunes, sandy and gravelly shores, and waste places	Grasslands	Low
red-stemmed cinquefoil	<i>Potentilla rubricaulis</i>	S3	Shores of sandy, slow-moving water, open sandy forests	Aquatic Systems	Medium
Rocky Mountain sedge	<i>Carex saximontana</i>	S3	Valleys and aspen groves	Grassland Systems	Medium
small dropseed	<i>Sporobolus neglectus</i>	S2	Dry and disturbed gravel barrens	n/a	Low
small yellow lady's slipper	<i>Cypripedium parviflorum</i> var. <i>makasin</i>	S3	Moist woodlands and meadows in the parklands	Forested and Shrubland Systems	High (confirmed by EDI)
smooth hawk's beard	<i>Crepis runcinata</i> ssp. <i>hispidulosa</i>	S1	Moist meadows and wooded areas	Forested and Shrubland Systems	Medium
soft wild bergamot	<i>Monarda fistulosa</i> var. <i>mollis</i>	S3	Mesic to dry shrublands, meadows, and open forests	Forested and Shrubland Systems	Medium
tall blue lettuce	<i>Lactuca biennis</i>	S3	Lakeshores and moist, rich woods	Forested and Shrubland Systems	Low
tall bur marigold	<i>Bidens frondose</i>	S3	Along shores, wet ditches, wet fields, and disturbed soil	Aquatic Systems	Low
water pimpernel	<i>Samolus parviflorus</i>	SH	Swamps, low rocky areas along rivers, and borders of small streams in wooded areas	Aquatic Systems	Low

Notes:

a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023a).

b) University of Saskatchewan n.d.

S1 = Critically Imperiled/Extremely Rare, S2 = Imperiled/Very Rare, S3 = Vulnerable/Rare to Uncommon, S4 = Apparently Secure, S5 = Secure/Common.

When the spatial extent was reduced to the LSA, of the initial 22 species, only six remained (Figure 6). These include blue wild rye (*Elymus glaucus* ssp. *glaucus*), California amaranth (*Amaranthus californicus*), narrow-leaved water plantain (*Alisma gramineum*), red-stemmed cinquefoil (*Potentilla rubricaulis*), small dropseed (*Sporobolus neglectus*), and small yellow lady's slipper.

At the PSA extent, small yellow lady's slipper and four additional plant SOMC were confirmed with the earliest recording dated 1931 (Table 3-6 and Appendix E). Four of the observed flora SOMC are provincially ranked as Vulnerable (S3), and one is ranked as Imperiled (S2).

**Table 3-6 Plant Species of Management Concern Historically Documented in the Project Study Area by SKCDC**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	LAST RECORDED DATE OF OBSERVATION
blue wild rye	<i>Elymus glaucus</i> ssp. <i>glaucus</i>	S3	1931
California amaranth	<i>Amaranthus californicus</i>	S2	1979
narrow-leaved water plantain	<i>Alisma gramineum</i>	S3	1956

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	LAST RECORDED DATE OF OBSERVATION
red-stemmed cinquefoil	<i>Potentilla rubricaulis</i>	S3	1939
small yellow lady's slipper	<i>Cypripedium parviflorum var. makasin</i>	S3	2023 (Confirmed by WSP)

Notes:

a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023a).

S4 = Apparently Secure; uncommon but not rare, S3 = Vulnerable / Rare to Uncommon; at moderate risk of extinction or extirpation due to restricted range, relatively few populations, recent and widespread declines, threats, or other factors, S2 = Imperiled / Very Rare; at high risk of extinction or extirpation due to a very restricted range, very few populations, steep declines, threats or other factors, S1 = Critically Imperiled / Extremely Rare; at very high risk of extinction or extirpation due to extreme rarity, very steep declines, high threat level, or other factors.

EDI (2022) conducted Species Detection Surveys (SDS) in accordance with the Rare Vascular Plant Survey Protocol (ENV 2022) on June 28 and 29, 2021 (early season), and August 30 and 31, 2021 (late season). During their field program two SOMC were confirmed within the PSA, red elderberry (*Sambucus racemosa ssp.pubens*) and small yellow lady's slipper.

Both SOMC were identified within the eastern side of the PSA. Red-elder berry was documented in the mesic shrub community, and the small yellow lady's slipper was documented in the open canopy mixed forest community type (Figure 7).

### 3.1.6 WETLANDS AND HYDROLOGY

Wetlands within the PSA were previously assessed in 2009, 2012, 2015, and 2022 (EDI, 2022). At that time, two wetlands were recorded to be within the PSA: one Permanent (Class V) and one Seasonal (Class II). An additional Class III wetland was noted during the desktop review and field reconnaissance in June of 2023. Stewart and Kantrud (1971) was the primary method used to classify wetlands. Definitions of wetland classes are summarized below (Table 3-7). In 2015, the wetland assessment conducted by Golder Associates included a functional wetland assessment study according to protocols outlined by the Minnesota Routine Assessment Method (MnRAM) (EDI, 2022). It was noted that between the 2009 and 2022 assessments, most of the wetlands that were originally classified had not changed. This wetland complex received a Preserve management class under the MnRAM (EDI, 2022).

**Table 3-7 Wetland Class Definitions**

CLASS	DEFINITION
Class I Wetland	Ephemeral wetlands which have free surface water for only a short period of time after snowmelt or storm events.
Class II Wetland	Temporary wetlands which are periodically covered by standing or slow-moving water with snowmelt lasting a few weeks and several days after a storm event.
Class III Wetland	Seasonal wetlands that are usually dry by midsummer.
Class IV Wetland	Semi-permanent wetlands that usually maintain surface water throughout the growing season (May to September).
Class V Wetland	Permanent wetlands that maintain standing water year around, with the center deep enough that no emergent vegetation can establish. Includes dugouts.

Source: Stewart and Kantrud (1971)

As previous reporting had larger project boundaries, a more refined review of wetlands within the LSA was completed to narrow in wetland findings for the Project and aid in the general field reconnaissance and any future efforts expended on site. Information collected during the 2023 general field assessment was applied to confirm wetland presence and provide site-specific descriptive information for the noted wetlands. Within the PSA, only three wetlands were confirmed, at the LSA extent, the number rose to 19. Wetlands noted included Class II, III, IV and Class V wetlands. Various natural drainages were noted linking the various wetlands confirmed. The identified Class V wetland is an extension of Chappell Marsh which extends southeast of the PSA. Refer to Table 3-8 and Figure 4; Appendix A for more details pertaining to the location, size and number of noted wetlands within the spatial extents assessed.



**Table 3-8 Wetland Classification in the Project and Local Study Areas**

WETLAND CLASS	PSA		LSA	
	NUMBER OBSERVED	WETLAND AREA (ha)	NUMBER OBSERVED	WETLAND AREA (ha)
Class I Wetland	-	-	2	1.2
Class II Wetland	1	0.4	4	2.3
Class III Wetland	1	0.2	13	10.9
Class IV Wetland	-	-	7	5.7
Class V Wetland	2	9.3	8	66.2
Anthropogenic	-	-	1	0.1
<b>Total</b>	<b>3</b>	<b>9.9</b>	<b>19</b>	<b>86.7</b>

### 3.1.7 FISH AND FISH HABITAT

Fish and fish habitat was not identified through the review of previous reports and studies. A desktop review of available imagery and the HABISask online application, conducted in June 2023, noted no confirmed fish or fish habitat within the PSA.

### 3.1.8 WILDLIFE

To identify possible SOMC within the Project area, available wildlife information pertaining to the various spatial extents (RSA, LSA, and PSA) was evaluated.

A review using HABISask at the RSA extent resulted in the presence of 31 wildlife SOMC (Table 3-9). Three avian species, barn swallow (*Hirundo rustica*), horned grebe (*Podiceps auratus*), and lesser yellowlegs (*Tringa flacipes*) are designated by the COSEWIC and federally protected under the SARA. All three have been confirmed to be present within the PSA (EDI, 2022). Two additional species with legislative implications, the northern leopard frog (*Lithobates pipens*) and the western tiger salamander (*Ambystoma mavortium*) are considered to have high potential to be observed within the identified riparian areas present within the PSA. Additionally, a species previously not detected but has been identified as having a high likelihood of detection is the monarch butterfly (*Danaus plexippus*)

**Table 3-9 Wildlife Species of Management Concern Identified Within the Regional Study Area and Their Potential to Occur in the Project Study Area**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	HABITAT <sup>(b)</sup>	LIKELIHOOD TO OCCUR WITHIN THE PSA
<b>Birds</b>				
bank swallow	<i>Riparia riparia</i>	S4B, S5M	Riverbanks, creeks, seashores, and lakes.	High (EDI Confirmed)
barn swallow	<i>Hirundo rustica</i>	S4B	Agricultural lands, suburban areas, marshes, and lakeshores.	High (EDI Confirmed)
Bobolink	<i>Dolichonyx oryzivorus</i>	S5B	Prefers prairies and meadows; stays on marshes during migration.	Medium
common nighthawk	<i>Chordeiles minor</i>	S4B	Gravel areas provide nesting habitat, and lighting systems around buildings serve as forage areas for insects.	High (EDI Confirmed)
Cooper's hawk	<i>Accipiter cooperii</i>	S4B, S2N, S2M	Mixed deciduous forests and open woodlands, including open woodlots, riparian woodlands in dry country, open and pinyon woodlands, and occasional forested regions.	Low
eastern bluebird	<i>Sialia sialis</i>	S3B	Inhabits open woodlands, clearings, farmlands, parks, orchards, gardens, and fields.	Low

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	HABITAT <sup>(b)</sup>	LIKELIHOOD TO OCCUR WITHIN THE PSA
glaucous gull	<i>Larus hyperboreus</i>	S2N	Shores of lakes, rivers, and coast, as well as refuse dumps and sewage outflows.	Low
golden eagle	<i>Aquila chrysaetos</i>	S3B, S3N, S4M	Habitats include occasional areas, canyons, shrublands, and grasslands.	Medium
Harris's sparrow	<i>Zonotrichia querula</i>	SUB, S5M	Breeds in mixed forest-tundra zones of north-central Canada but migrates to the Great Plains.	Medium
horned grebe	<i>Podiceps auratus</i>	S5B	Breeds on prairies and freshwater lakes with both open waters and marsh vegetation; also nests in marshes, small sloughs, ponds, and occasionally rivers.	High (EDI Confirmed)
lesser yellowlegs	<i>Tringa flacipes</i>	S4B	Coastal mudflats, pans and lagoons, inland lakes, ponds, rivers, sewage works, and flooded grasslands.	High (EDI confirmed)
northern shrike	<i>Lanius borealis</i>	S1B, S4N, S4M	Forest edges, open willow brush, and brush-bordered swamps and bogs.	Low
olive-sided flycatcher	<i>Contapous cooperi</i>	S4B	Boreal spruce and fir forests, usually near openings, burns, ponds, and bogs.	Medium
Osprey	<i>Pandion laiaetus</i>	S3B	Rivers, lakes, and coast. Found near water, either fresh or salt water, where a large number of fish are present.	Low
pine grosbeak	<i>Pinicola enucleator</i>	S2B, S4N	Prefers open coniferous forests and forest edges.	Low
red-headed woodpecker	<i>Melanerpes erthrocephalus</i>	S1B	Temperate, open habitats	Medium
Sprague's pipit	<i>Anthus spragueii</i>	S3B	Short grass prairies	Low
Townsend's solitaire	<i>Myadestes townsendii</i>	S3N	Coniferous forest around 3,000 feet below the timberline.	Low
turkey vulture	<i>Cathartes aura</i>	S3B	Deciduous forests, woodlands, and scrublands; often seen over adjacent farmlands.	Low
western grebe	<i>Aechmophorus occidentalis</i>	S3B	Large lakes with reed or rushes, shallow coastal bays, and estuaries.	Low
whooping crane	<i>Grus americana</i>	SXB, S1M	Currently, the only self-sustaining wild population consists of about 440 birds that migrate between breeding grounds in northern Canada and wintering habitat on the Texas coast. Prefers grassy plains interspersed with marshes, numerous lakes, and ponds. Migrates through Saskatchewan.	Low
<b>Amphibians</b>				
northern leopard frog	<i>Lithobates pipiens</i>	S3	During winter, it hibernates in well-oxygenated rivers, creeks, ponds and lakes that do not freeze to the bottom. During the breeding season, it occupies marshes, ponds and lakeshores, typically those with plenty of vegetation. In summer, it often disperses into grasslands and forests.	High
western tiger salamander	<i>Ambystoma macortium</i>	S4	Sandy or friable soils surrounding semi-permanent to permanent water bodies lacking predatory fish.	High

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	HABITAT <sup>(b)</sup>	LIKELIHOOD TO OCCUR WITHIN THE PSA
<b>Mammals</b>				
little brown myotis	<i>Myotis lucifugus</i>	S4B, S4N	Roosting in buildings, trees, and caves during the day.	Medium
pronghorn	<i>Antilocapra americana</i>	S3	Open plains, field, grasslands, brush, deserts, and basins.	Low

Source: Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC 2023b)

Notes:

a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC 2023a).

b) University of Saskatchewan n.d.

S1 = Critically Imperiled/Extremely Rare, S2 = Imperiled/Very Rare, S3 = Vulnerable/Rare to Uncommon, S4 = Apparently Secure, S5 = Secure/Common; B = for a migratory species, applies to the breeding population in the province; M = for a migratory species, rank applies to the transient (migrant) population; N = for a migratory species, applies to the non-breeding population in the province; U = status is uncertain in Saskatchewan.

When the spatial extent was reduced to the LSA, of the initial 31 species, only nine remained (Figure 5).

At the PSA extent, four wildlife SOMC have been historically observed within the PSA, provincially ranked as Apparently Secure (S4) and Special Concern or Threatened under the SARA and COSEWIC (Table 3-10).

Identified wildlife SOMC will inform of requirements of potential field assessments (e.g., breeding birds nest sweeps) prior to any improvements to the PSA. Provincial activity restriction guidelines may be applicable if SOMC are confirmed to be present in the PSA (Menv, 2017).

As well, incidental wildlife occurrences and suitable habitat presence was documented during the site visit and are included in Appendix F.

**Table 3-10 Historic Wildlife Species of Management Concern Observed within the Project Study Area Provided by HABISask**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(A)</sup>	COSEWIC STATUS	SARA STATUS
<b>Known Species</b>				
barn swallow	<i>Hirundo rustica</i>	S4B	Special Concern	Threatened
common nighthawk	<i>Chordeiles minor</i>	S4B	Special Concern	Special Concern
lesser yellowlegs	<i>Tringa flavipes</i>	S4B	Threatened	-
western tiger salamander	<i>Ambystoma mavortium</i>	S4	Special Concern	Special Concern

Notes:

Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023b).

S1 = Critically Imperiled/Extremely Rare; S2 = Imperiled/Very Rare; S3 = Vulnerable/Rare to Uncommon; S4 = Apparently Secure; S5 = Secure/Common; B = for a migratory species, applies to the breeding population in the province; M = for a migratory species, rank applies to the transient (migrant) population; N = for a migratory species, applies to the non-breeding population in the province; U = status is uncertain in Saskatchewan.

COSEWIC = Committee on the Status of Endangered Wildlife in Canada (Government of Canada 2022); SARA = Species at Risk Act (Government of Canada, 2022); - = not assessed.

Notably absent from the wildlife species inventories reviewed are arthropods. No confirmed species information was available for review.

A full list of the currently available wildlife observations associated with the PSA has been included in Appendix F.

### 3.1.8.1 MIGRATORY BIRDS

According to the EDI Natural Area Screening Report (2022), 91 bird species have historically been documented in the general area of the PSA. This report noted that most of the species' observations were associated with one of the two Afforestation Areas. Of the 91 bird species, 27 were observed within the Open Canopy Mixed Woodland and the Chappell Marsh (Table 3-11). Of these 27, 11 were riparian/wetland dependent species. As noted earlier, EDI confirmed four listed SOMC, barn swallow (*Hirundo rustica*), horned grebe (*Podiceps auratus*), common nighthawk (*Chordeiles minor*) and lesser yellowlegs (*Tringa flavipes*). These species were confirmed in the wetland and eastern Mixedwood forest, respectively. No additional species of note were observed during the 2023 general site visit.

**Table 3-11 Avian Species Observed in the Richard St. Barbe Baker Afforestation Area During Previous Breeding Bird Surveys (EDI 2019, 2022)**

COMMON NAME	SCIENTIFIC NAME	OPEN CANOPY	WETLAND
American goldfinch	<i>Spinus tristis</i>	Yes	Yes
American robin	<i>Turdus migratorius</i>	Yes	No
barn swallow	<i>Hirundo rustica</i>	No	Yes
black-billed magpie	<i>Pica hudsonia</i>	Yes	No
black-capped chickadee	<i>Poecile atricapillus</i>	Yes	No
blue-winged teal	<i>Spatula discors</i>	No	Yes
Canada goose	<i>Branta canadensis</i>	No	Yes
chipping sparrow	<i>Spizella passerina</i>	Yes	No
clay-coloured sparrow	<i>Spizella pallida</i>	Yes	No
common yellowthroat	<i>Geothlypis trichas</i>	No	Yes
gadwall	<i>Mareca strepera</i>	No	Yes
house wren	<i>Troglodytes aedon</i>	Yes	No
killdeer	<i>Charadrius vociferus</i>	No	Yes
least flycatcher	<i>Empidonax minimus</i>	Yes	No
lesser yellowlegs	<i>Tringa flavipes</i>	No	Yes
magnolia warbler	<i>Setophaga magnolia</i>	Yes	No
mallard	<i>Anas platyrhynchos</i>	No	Yes
northern shoveler	<i>Spatula clypeata</i>	No	Yes
palm warbler	<i>Setophaga palmarum</i>	Yes	No
red-winged blackbird	<i>Agelaius phoeniceus</i>	No	Yes
ring-billed gull	<i>Larus delawarensis</i>	No	Yes
rock pigeon	<i>Columba licia</i>	Yes	Yes
song sparrow	<i>Melospiza melodia</i>	No	Yes
tree swallow	<i>Tachycineta bicolor</i>	No	Yes
western meadowlark	<i>Sturnella neglecta</i>	Yes	No
yellow warbler	<i>Setophaga petechia</i>	Yes	Yes
yellow-rumped warbler	<i>Setophaga coronata</i>	Yes	No

Source: EDI, 2022

### 3.1.8.2 AMPHIBIANS

Targeted amphibian surveys conducted by EDI in 2021 surveyed for egg masses, adults, and young of the year by visual or auditory methods. No observations were made during these surveys. Anecdotally observed (Pers. Comm. \_\_\_\_\_)

### 3.1.8.3 MAMMALS

Remote cameras (RC) were deployed as part of a study by completed by EDI in 2021 to document habitat connectivity and general wildlife movement. Of the 10 cameras deployed, four cameras (BL RC01, BL RC02, BL RC03, and BL RC04) were located within the PSA. The cameras documented 11 species, one of which was unidentifiable. In the following year (January and March of 2022), EDI undertook winter track surveys which included portions of the PSA. This subsequent survey identified 11 species along 41 transects, with the snowshoe hare (*Lepus americanus*) and coyote (*Canis latrans*) representing the highest frequency of occurrences (EDI, 2022).

### 3.1.8.4 WILDLIFE MOVEMENT

The collective results from the RC and winter tracking program did not identify any obvious trends or patterns of wildlife movement in the Afforestation Areas (EDI, 2022). However, the following was noted:

- Wildlife (mainly fox, coyote, and deer) appears to move in and out of the PSA, predominately in a north-south direction.
- Highway No. 7 currently acts as a barrier to wildlife movement to and from the George Genereux Urban Regional Park.
- Areas with lower human/dog activity had the greatest wildlife activity within the areas they assessed.
- Areas with higher concentrations of natural Closed Canopy Deciduous Woodland and wetland habitats had greater wildlife presence.
- There were few trails present, often being single track sets indicating they are not high-use trails.
- The most frequently observed mammals were coyote, white-tailed jackrabbit, and deer.

## 3.1.9 SPECIES OF INTEREST TO INDIGENOUS COMMUNITIES

The City of Saskatoon is located on Treaty 6 Territory and the Homeland of the Metis (City of Saskatoon, 2023c). Archaeological evidence at Wanskewin Heritage Park (a site located north of the City along the South Saskatchewan River) shows the area was occupied at least 6,000 years ago (City of Saskatoon, 2023d). Over time, the Plains Cree, Saulteaux or Plains Ojibwe, Dakota, and the Nakoda or Assiniboine First Nation cultures have lived in the area now known as Saskatoon (City of Saskatoon, 2023d).

There are many species found within the PSA that have been used for medicine, construction, cooking, or ceremonial purposes. Select species are highlighted below in Table 3-12 but are not an exhaustive list.

**Table 3-12 Select Vegetative Species of Interest to Indigenous Communities Found Within the RSBBA**

COMMON NAME	SCIENTIFIC NAME	PURPOSE
Canada sagewort	<i>Artemisia campestris ssp. canadensis</i>	Used as a ceremonial plant and burned for incense <sup>1</sup> .
Saskatoon	<i>Amelanchier alnifolia</i>	The most important fruit for Indigenous people <sup>2</sup> .
Sweetgrass	<i>Anthoxanthum hirtum ssp. arcticum</i>	Used as a ceremonial plant for smudging, art, and basket weaving <sup>3</sup> .
Silverberry	<i>Eleagnus commutata</i>	Seeds traditionally used for beading <sup>4</sup> .

Notes:

1 Plants of the Western Boreal Forest and Aspen Parkland.

2 Traditional Plant Foods of Canadian Indigenous Peoples: Nutrition, Botany and Use.

3 The Boreal Herbal, Wild Food and Medicine Plants of the North.

4 Louis Riel Institute.

It is understood that during stakeholder consultation in the fall of 2023, local community experts will have an opportunity to provide a more detailed traditional knowledge and historical land uses account of the PSA to better guide the development of the NAMP.

### 3.1.10 SPECIES OF CONSERVATION OR RESTORATION INTEREST

Friends of the Saskatoon Afforestation Areas (FSAA) have identified the small yellow lady's slipper (*Cypripedium parviflorum var. makasin*) as a special species of conservation interest within the City. This SOMC and its habitat are under threat due to disturbance in the immediate and surrounding area to the RSBBA. The FSAA has a long-term goal of protecting the habitat of this species and aims to see an increase in species within the next 20 years (Friends of the Saskatoon Afforestation Areas, 2023).

Although EDI did not observe any amphibians in 2021, two species of conservation or restoration interest may reside with the PSA:

- The western tiger salamander is a species that is predicted to be impacted by climate change, as prolonged and frequent droughts are causing habitat loss and fragmentation between their breeding (e.g., fishless waterbodies) and overwintering grounds (e.g., burrows or debris) (COSEWIC, 2012). Protection of suitable waterbodies and connectivity between overwintering and breeding habitat is key in managing this species.
- The northern leopard frog is a COSEWIC listed species that has not been confirmed detected in the PSA but has a high likelihood of being present. The life cycle of the northern leopard frog consists of three distinct habitat types: deep and permanent waterbodies for the winter, waterbodies such as wetlands for breeding, and moist upland meadows or grasslands for summer (Environment Canada, 2013). It is important for northern leopard frogs to have access to a corridor between these habitats to successfully complete their life cycle.

Horned grebe, lesser yellow legs, common nighthawk and barn swallow have been confirmed within the PSA; specific habitat areas frequented by these species should be better documented for conservation consideration.

#### 3.1.10.1 THREATS

According to the information reviewed, some of the key threats to the conservation and future sustainability of the PSA include, but are not limited to:

- Undesirable woody species management of European buckthorn and caragana will require a multi-year and integrated weed management program utilizing multiple control methods. European buckthorn alters soil properties which over time reduces the density and distribution of native species competitors (Heneghan et al., 2006), and it is dispersed easily through ecosystems by avian species. Caragana is a species which is resistant to many chemical and mechanical controls, often requiring multiple treatments to limit its spread as its seeds are unaffected by control methods and can quickly recolonize an area (Tree Canada 2023).
- Leafy spurge (*Euphorbia esula*) produces a milky latex that is unpalatable to browsing ungulates or mammals and can produce blisters and swelling when contact is made (Invasive Species Council of BC, 2017).
- Common tansy (*Tanacetum vulgare*) can quickly outcompete native plants and produces a toxic compound that can harm cattle and wildlife when ingested (NCC, 2023).
- Although not detected within the LSA or PSA, wild boar (*Sus scrofa*) may become a serious threat. They are a destructive and elusive invasive species, expanding exponentially out of control on the Canadian prairies (Shewaga, 2021). They can cause severe damage to crops, riparian areas and other natural habitats through behaviours such as digging, rooting and wallowing. In addition, feral pigs are known to harass livestock and wildlife (Avila et al., 2022) While not observed within or in proximity to RSBBA, they have the potential to pose a significant threat to user groups and the ecology of the area.

# 4 KNOWLEDGE GAPS

During the course of the baseline summary investigation, several areas where additional information will be required to inform the RSBBA NAMP were identified. The ‘knowledge gaps’ have been organized by Soil, Vegetation, Aquatics and Wildlife

## SOILS

- Contamination from CN activities should remain a consideration to the health and condition of soil (and in turn groundwater, and species composition). The CN dump site and perimeter boundary have potential contaminants leaching into the site, but details are unknown, and the effects are understudied.

## VEGETATION

- Detailed habitat classification and distribution do not currently exist for the PSA and should be further investigated to assist with future management objectives. The current scale of information is coarse, and therefore it will prove challenging to identify site-specific targets and constraints. For example, acquiring select historical imagery for the area will aid in boundary delineation for the identified natural assets.
- Consider undertaking an inventory of naturalized species (e.g., caragana, and scotch pine [*Pinus sylvestris*]) that were historically introduced to the RSBBA to refine our understanding of natural feature health and guide future replacement (e.g., replace with native flora to Saskatchewan) and long-term restoration/enhancement goals.
- Document and map the distribution of current nuisance and noxious weeds to facilitate current and future weed management planning.
- Locate and confirm the presence and non-detection of SOMC that are ranked with a high probability of occurring in the PSA) following industry-acceptable methodologies.
- Reaffirm the presence of small yellow lady’s slipper and red elderberry in order to refine the spatial extent, population size and health of these species in order to develop sound management objectives/plans.
- Consider undertaking a targeted soil investigation to confirm the soil classifications noted in order to increase the probability of success when developing native restoration/enhancements and identifying areas of elevated erosion risk.
- Consider creating management units that incorporate ecosystem health and habitat type to aid in monitoring, maintenance, and management for the development of objectives in the NAMP.

## AQUATICS

- Chappell Marsh is a large permanent wetland connecting to wetlands within the RSBBA. This feature may potentially serve as suitable habitat for fish if seasonal hydrological connectivity to the South Saskatchewan River exists and anoxic conditions do not persist during the winter. Therefore, consider undertaking a fish and fish habitat assessment of this permanent wetland to complete our understanding of the baseline aquatic use. This information may also inform/limit what infrastructure may be allowed during future planning exercises.
- Personal communication with Michael Hill at the City of Saskatoon has indicated that the marsh is currently dry, which may be due to a culvert being put in at the wrong elevation. This topic requires further investigation.
- Water quality is currently unknown. Consider undertaking a water chemistry analysis to develop a baseline water quality understanding for future use targeting any contamination run on or for the consideration of infrastructure planning and targeted restoration/rehabilitation (as required).
- Consider developing a drainage/climate resiliency plan to inform trail/park infrastructure placement and expected pre-development run on to sustain the RSBBA.
- Undertake hydraulic-hydrologic modelling to understand the pre-development hydrological regime supporting the various wetlands located in the RSBBA. Watershed/catchments should be defined in order of impacts from infrastructure installations within and land use changes that may be proposed directly adjacent to the RSBBA.

## WILDLIFE

- Verify if high probability and confirmed species are utilizing areas within the PSA as part of their natural lifecycle as direct management objectives may be required to sustain the species noted. At this time, it has been identified that the northern leopard frog and the monarch butterfly of having a high likelihood of being detected within the PSA. Horned grebe, lesser yellow legs, common nighthawk and barn swallow have been confirmed within the PSA by EDI (2022).
- Baseline information pertaining to medium-large-sized (e.g., Elk [*Cervus elepahus*], North American porcupine [*Erethizon dorastum*]) terrestrial mammal use is limited in the documentation provided. Consider targeted surveys to develop a better baseline understanding of habitat use and seasonal movement. This information may be useful when considering infrastructure placement (e.g., trails, roads) and wildlife management objectives.
- Consider inventorying any existing bird houses or bird feeders (providing location, material, and frequency of maintenance). Maintained supportive structure can act as an attractant. However, unmaintained bird houses can host insects, fungus, and mites which are detrimental to avian health. In addition, the feed used could represent a vector for the introduction of undesirable flora species.
- Arthropod documentation was unavailable at the time of review. Consider completing inventories to determine which species are present to inform restoration/enhancement plans (target host plants for specific species).



# 5 CONCLUSION

WSP was retained by the City of Saskatoon to complete a literature and desktop environmental review to summarize the results describing the present environmental condition of the RSBBA. This baseline summary will be used to support the Natural Area Management Plan that will outline the steps required to protect, restore, and manage the area. The literature and desktop review and site visit were completed in June 2023.

The following environmental features and SOMC that were observed to have the potential to occur in the PSA and LSA may require consideration for future site design and site improvements:

- Three Nuisance and 16 Noxious weed species have been identified in the PSA and LSA.
- Nineteen wetlands were identified within the LSA. The majority of the wetlands identified were Class III, Class IV, and Class V, which covered 10.9 ha, 5.7 ha, and 66.2 ha, respectively, of the LSA.
- Based on the desktop review, five wildlife SOMC were identified with the potential to be present in the PSA.
- Barn swallow (confirmed by EDI), horned grebe (confirmed by EDI), lesser yellowlegs (confirmed by EDI), common nighthawk (confirmed by EDI), northern leopard frog,
- Based on the desktop review, five plant SOMC were identified with high potential to be present in the PSA.
- Blue wild rye, bristle-leaved sedge, mucronate blue-eyed grass, red elderberry (Confirmed by EDI) and small yellow lady's slipper (confirmed by EDI and WSP).

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## COMPLETE LIST OF CITY SUPPLIED DOCUMENTS REVIEWED FOR THE PROJECT

- Management plan boundaries for the Small Swale and RSBBA.
- Approved land use plans for adjacent areas (e.g. University Heights, Blairmore) found on the City’s Sector Plan web page.
- Blairmore Natural Area Screening Final Report, 2022.
- Bylaw No. 9700 – Official Community Plan, 2020.
- City of Saskatoon Climate Adaptation Strategy (Part2)
- Climate Projections and Possible Impacts (Part 1).
- Corporate Climate Adaptation Strategy (Part 2).
- City of Saskatoon Contractor Environment Guidelines, 2019).
- City of Saskatoon Green Infrastructure Strategy, 2020.
- City of Saskatoon Pathways for an Integrated Green Network, 2022.
- City of Saskatoon Standard Construction Specifications, 2023.
- City of Saskatoon Wetland Policy (C09-041).
- Meewasin Northeast Policy, 2015.
- Meewasin Valley-wide Resource Management Plan, 2017.
- Montgomery Place Local Area Plan Final Report, 2018.
- Natural Areas Inventory for the City of Saskatoon, 2019.
- Natural Asset Inventory Dashboard, 2021.
- Natural Capital Asset Valuation Pilot Project, 2020.
- Northeast Swale Development Guidelines, 2012.
- Northeast Swale Resource Management Plan, 2013.
- Native Plant Solutions – Small Swale Study (draft report).
- UH3 Natural Area Screening Report, 2021.
- UH3 Natural Area Screening What We Heart Report, 2022.

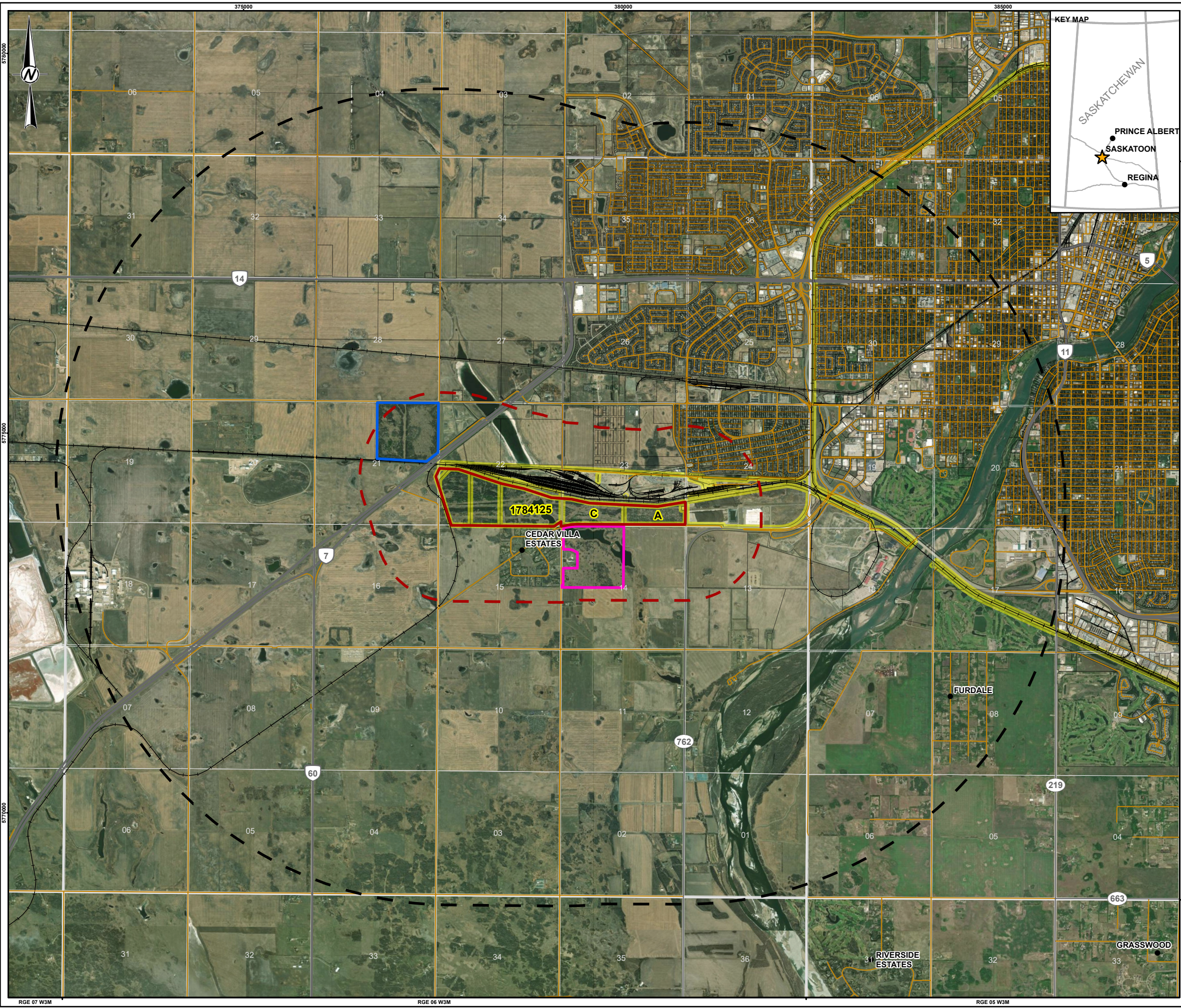
# APPENDIX

## A FIGURES



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FIGURE 6	SPECIES OF MANAGEMENT CONCERN (VEGETATION)
FIGURE 7	COMBINED SOMC
FIGURE 8	NOXIOUS AND NUISANCE WEEDS



- LEGEND**
- POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
  - RAILWAY
  - CN YARDS MANAGEMENT AREA
  - PARCEL BOUNDARY
  - PROJECT STUDY AREA
  - LOCAL STUDY AREA
  - REGIONAL STUDY AREA
  - CHAPPEL MARSH CONSERVATION AREA
  - GEORGE GENEREAU URBAN REGIONAL PARK



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CLIENT  
 CITY OF SASKATOON

PROJECT  
 RICHARD ST. BARBE BAKER NATURAL AREA MANAGEMENT PLAN

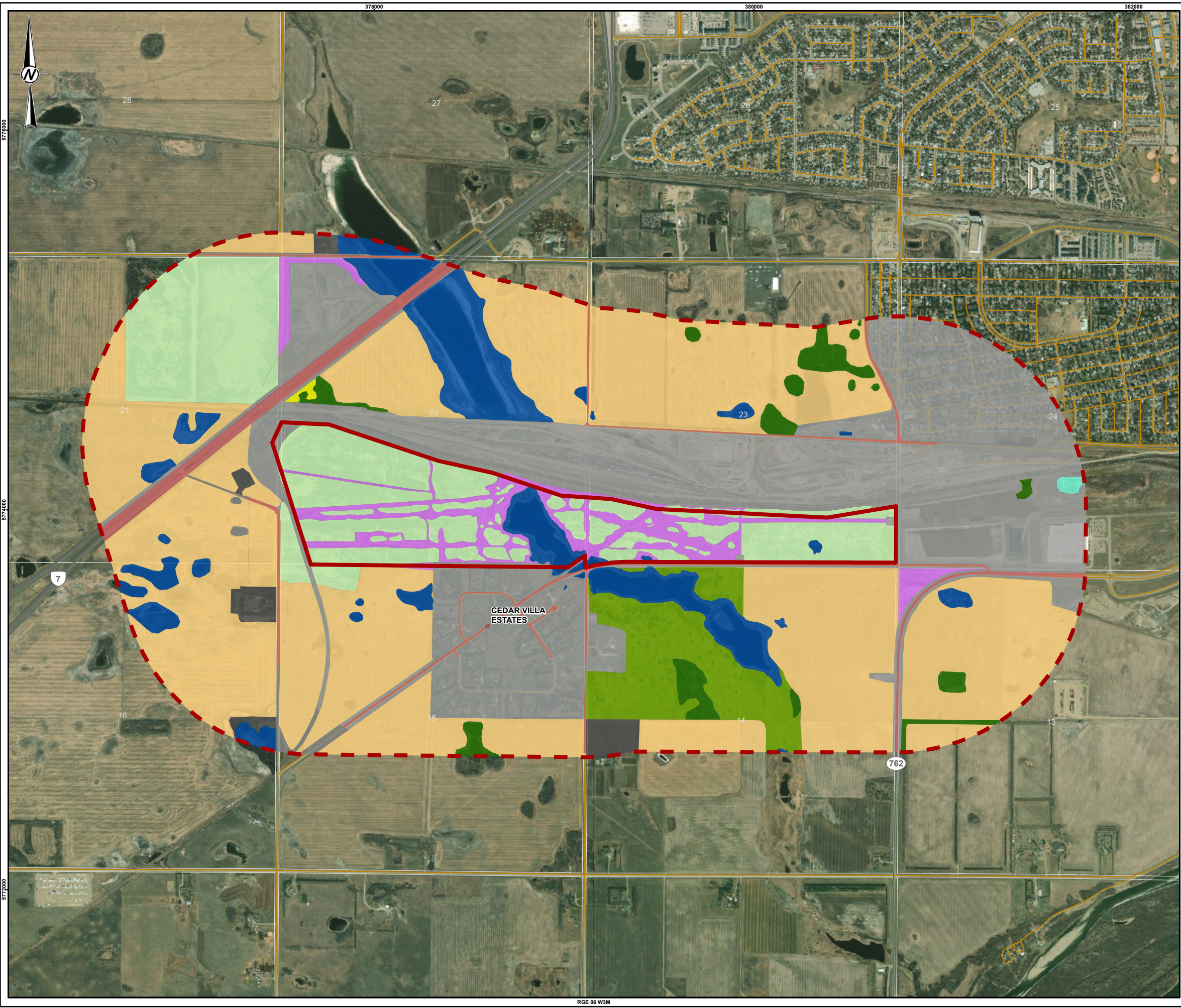
TITLE  
 SITE LOCATION

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	



PROJECT NO. CA0003383.0741 CONTROL 200 REV. A FIGURE 1

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**LEGEND**

	PROJECT STUDY AREA		CLOSED CANOPY DECIDUOUS WOODLAND
	VEGETATION LOCAL STUDY AREA		CROP LAND (CULTIVATED)
	POPULATED PLACE		DISTURBED/DEVELOPED
	PRIMARY HIGHWAY		HAY LAND (FORAGE)
	SECONDARY HIGHWAY		OPEN CANOPY DECIDUOUS WOODLAND
	LOCAL ROAD		OPEN CANOPY MIXED WOODLAND
			ROAD
			TALL SHRUB GRASSLAND
			TAME GRASSLAND
			WETLAND
			YARD SITE ACTIVE
			<ALL OTHER VALUES>



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CLIENT  
 CITY OF SASKATOON

PROJECT  
 CHANGE PROJECT TO RICHARD ST. BARBE BAKER NATURAL AREA MANAGEMENT PLAN

TITLE  
**LAND COVER CLASSIFICATION**

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

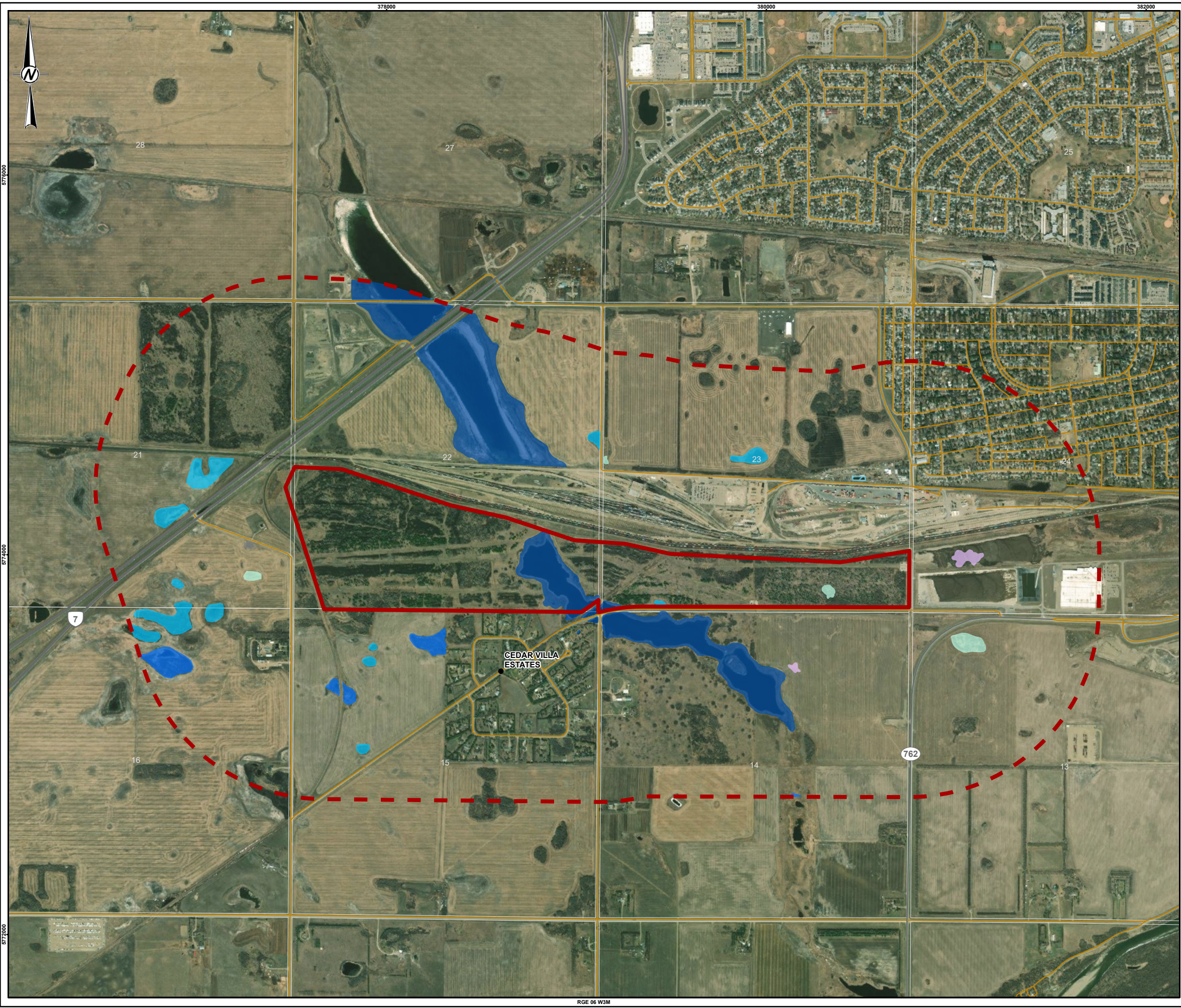
PROJECT NO.	CONTROL	REV.	FIGURE
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- LEGEND**
- PROJECT STUDY AREA
  - LOCAL STUDY AREA
  - POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
  - CLASS I WETLAND
  - CLASS II WETLAND
  - CLASS III WETLAND
  - CLASS IV WETLAND
  - CLASS V WETLAND
  - ANTHROPOGENIC WETLAND
  - <ALL OTHER VALUES>



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 CITY OF SASKATOON

PROJECT  
 RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL PLAN

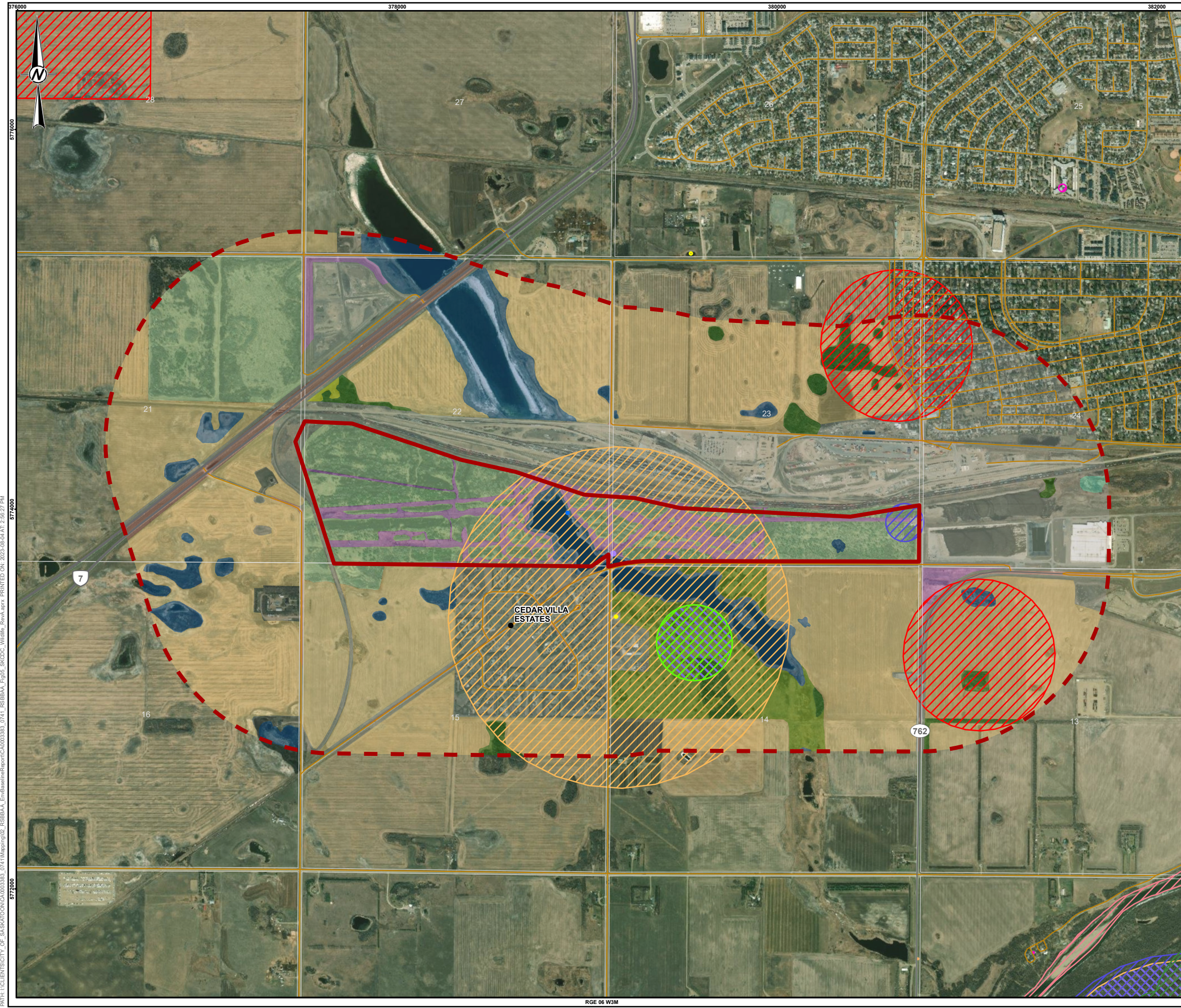
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**WETLANDS CLASSIFICATION**

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
CA0003383.0741	200	A	4

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- LEGEND**
- PROJECT STUDY AREA
  - WILDLIFE LOCAL STUDY AREA
  - POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
  - BANK SWALLOW
  - BARN SWALLOW
  - BOBOLINK
  - COMMON NIGHTHAWK
  - HORNED GREBE
  - LESSER YELLOWLEGS
  - LITTLE BROWN MYOTIS
  - MIGRATORY BIRD CONCENTRATION SITE
  - NORTHERN LEOPARD FROG
  - TURKEY VULTURE
  - WESTERN TIGER SALAMANDER
  - WHOOPING CRANE

- LAND COVER**
- CLOSED CANOPY DECIDUOUS WOODLAND
  - CROP LAND (CULTIVATED)
  - DISTURBED/DEVELOPED
  - HAY LAND (FORAGE)
  - OPEN CANOPY DECIDUOUS WOODLAND
  - OPEN CANOPY MIXED WOODLAND
  - ROAD
  - TALL SHRUB GRASSLAND
  - TAME GRASSLAND
  - WETLAND
  - YARD SITE ACTIVE
  - <ALL OTHER VALUES>



**NOTE(S)**  
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CLIENT  
 CITY OF SASKATOON

PROJECT  
 RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL SUMMARY

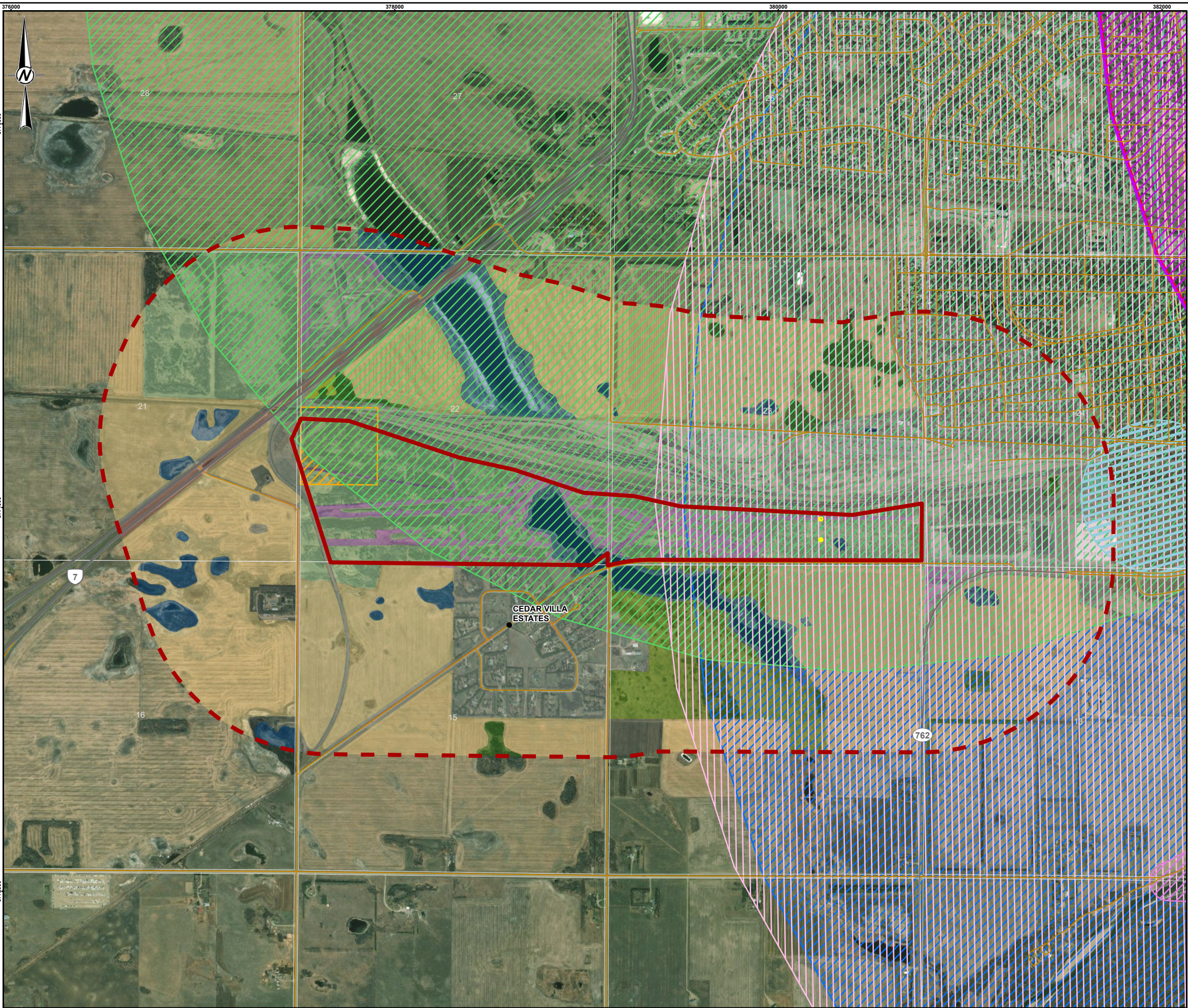
TITLE  
 SPECIES OF MANAGEMENT CONCERN (WILDLIFE)

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

PROJECT NO. CA0003383.0741 CONTROL 200 REV. A FIGURE 5

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**LEGEND**

- PROJECT STUDY AREA
- VEGETATION LOCAL STUDY AREA
- POPULATED PLACE
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- LOCAL ROAD
- BLUE WILD RYE
- CALIFORNIA AMARANTH
- HAIRY BUGSEED
- HOOKER'S BUGSEED
- NARROW-LEAVED WATER PLANTAIN
- RED-STEMMED CINQUEFOIL
- ROCKY MOUNTAIN SEDGE
- SMALL DROPSEED
- SMALL YELLOW LADY'S SLIPPER
- SMOOTH HAWK'S-BEARD
- SOFT WILD BERGAMOT

**LAND COVER**

- CLOSED CANOPY DECIDUOUS WOODLAND
- CROP LAND (CULTIVATED)
- DISTURBED/DEVELOPED
- HAY LAND (FORAGE)
- OPEN CANOPY DECIDUOUS WOODLAND
- OPEN CANOPY MIXED WOODLAND
- ROAD
- TALL SHRUB GRASSLAND
- TAME GRASSLAND
- WETLAND
- YARD SITE ACTIVE
- <ALL OTHER VALUES>



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**CLIENT**

CITY OF SASKATOON

**PROJECT**

RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL SUMMARY

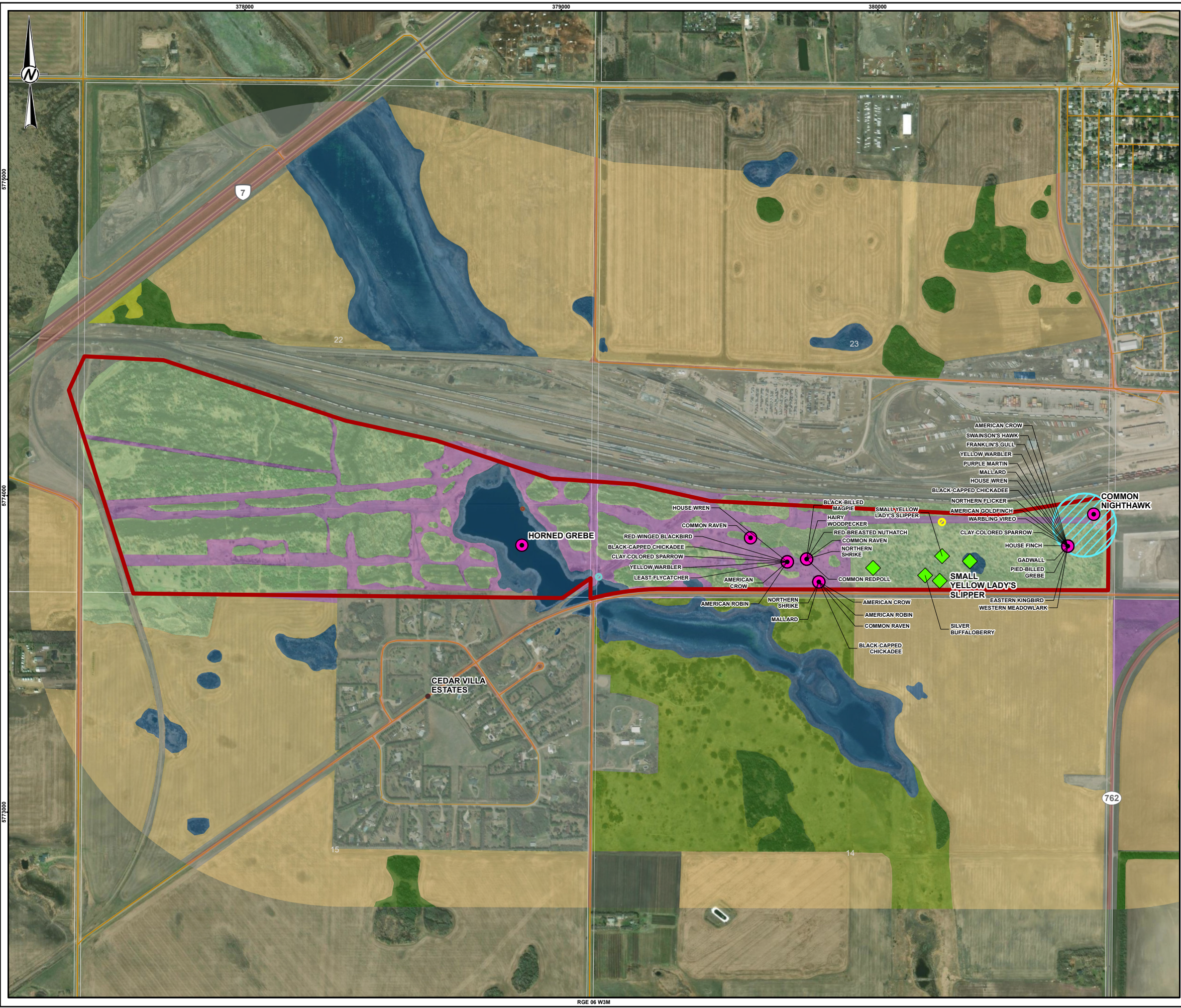
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SPECIES OF MANAGEMENT CONCERN (VEGETATION)

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PREPARED	LMS	
REVIEWED		
APPROVED		

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- LEGEND**
- PROJECT STUDY AREA
  - POPULATED PLACE
  - PRIMARY HIGHWAY
  - SECONDARY HIGHWAY
  - LOCAL ROAD
- LAND COVER**
- CLOSED CANOPY DECIDUOUS WOODLAND
  - CROP LAND (CULTIVATED)
  - DISTURBED/DEVELOPED
  - HAY LAND (FORAGE)
  - OPEN CANOPY MIXED WOODLAND
  - ROAD
  - TALL SHRUB GRASSLAND
  - TAME GRASSLAND
  - WETLAND
  - YARD SITE ACTIVE
- HISTORICAL OBSERVATIONS (SKCDC)**
- BARN SWALLOW
  - COMMON NIGHTHAWK
  - LESSER YELLOWLEGS
  - WESTERN TIGER SALAMANDER
  - SMALL YELLOW LADY'S SLIPPER
- SPECIES OF MANAGEMENT CONCERN - VEGETATION**
- ◆ SPECIES OF MANAGEMENT CONCERN - VEGETATION
- SPECIES OF MANAGEMENT CONCERN - WILDLIFE**
- SPECIES OF MANAGEMENT CONCERN - WILDLIFE



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**CLIENT**  
 CITY OF SASKATOON

**PROJECT**  
 RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL SUMMARY

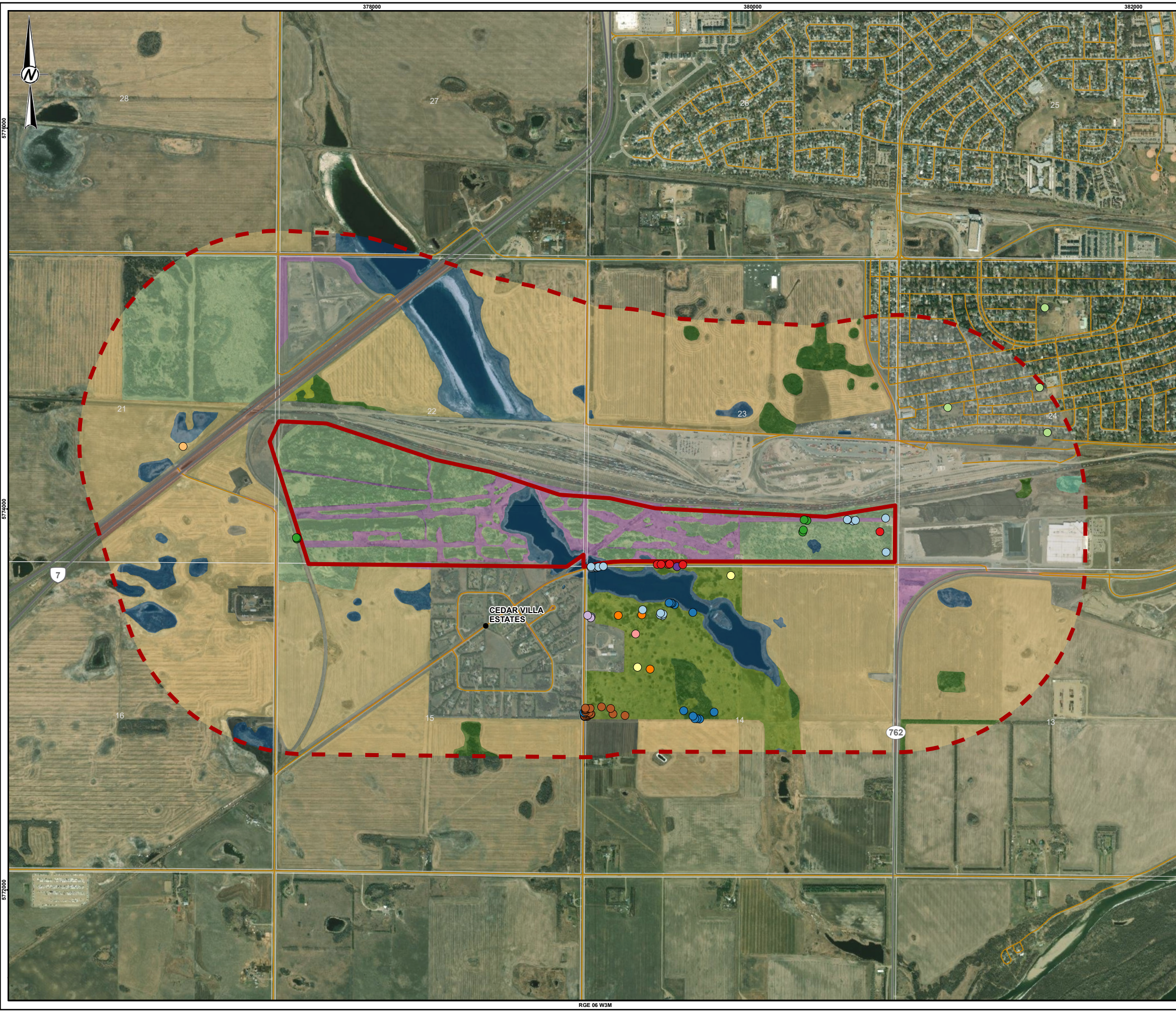
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DESIGNED	BN	
PREPARED	LMS	
REVIEWED		
APPROVED		

PROJECT NO. CA0003383.0741 CONTROL 200 REV. A FIGURE 7

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**LEGEND**

- PROJECT STUDY AREA
- VEGETATION LOCAL STUDY AREA
- POPULATED PLACE
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- LOCAL ROAD

**NOXIOUS AND NUISANCE WEED**

- ABSINTHE
- CLEMATIS
- EUROPEAN BUCKTHORN
- LEAFY SPURGE
- MALTESE-CROSS CAMPION
- OX-EYE DAISY
- PURPLE LOOSESTRIFE
- RUSSIAN OLIVE
- SCENTLESS CHAMOMILE
- SCOTCH PINE
- SIBERIAN ELM
- TALL BABY'S BREATH
- TANSY
- TARTARIAN HONEYSUCKLE

**LAND COVER**

- CLOSED CANOPY DECIDUOUS WOODLAND
- CROP LAND (CULTIVATED)
- DISTURBED/DEVELOPED
- HAY LAND (FORAGE)
- OPEN CANOPY DECIDUOUS WOODLAND
- OPEN CANOPY MIXED WOODLAND
- ROAD
- TALL SHRUB GRASSLAND
- TAME GRASSLAND
- WETLAND
- YARD SITE ACTIVE
- <ALL OTHER VALUES>

**DRAFT**

0 400 800  
1:20,000 METRES

**NOTE(S)**

1. THE INFORMATION DISPLAYED ON THIS MAP IS MADE AVAILABLE BY THE SASKATCHEWAN GOVERNMENT. THE GOVERNMENT OF SASKATCHEWAN MAKES NO GUARANTEE REGARDING THE ACCURACY OF THE INFORMATION. THIS INFORMATION IS UPDATED CONSISTENTLY AND THIS FIGURE IS A REPRESENTATION OF THE DATA ONLY FOR THE DATE INDICATED HERE: JUNE 2023.

**REFERENCE(S)**

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CLIENT  
CITY OF SASKATOON

PROJECT  
RICHARD ST. BARBE BAKER BASELINE ENVIRONMENTAL PLAN

TITLE  
**NOXIOUS AND NUISANCE WEEDS**

CONSULTANT	YYYY-MM-DD	2023-08-04
	DESIGNED	BN
	PREPARED	LMS
	REVIEWED	
	APPROVED	

PROJECT NO. CONTROL REV. FIGURE  
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PRINT: LICENSIBILITY\_OF\_SASKATCHEWAN\_CA0003383\_0741\_Mapping02\_ESEBBA\_A\_EinfBauPlanReport(CA0003383\_0741\_ESEBBA\_A\_EinfBauPlanReport) PRINTED ON: 2023-08-04 AT: 2:52:08 PM

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# APPENDIX

## **B** SITE

## PHOTOGRAPHS





Photo B-1: Looking north at example vegetation in the RSBBA; June 14, 2023 (380628E, 5773711N)



Photo B-2: Looking north at example vegetation in the RSBBA; June 14, 2023 (380479E, 5773699N)





**Photo B-3: Looking north at walking trail; June 14, 2023 (380048E, 5773717N)**



**Photo B-4: Looking east at example vegetation within the RSBBA; June 14, 2023 (379964E, 5773818N)**



**Photo B-5: Looking east at opening / access trail within the RSBBA; June 14, 2023 (379973E, 5773805N)**



**Photo B-6: Unoccupied nest within the RSBBA; June 14, 2023 (380322E, 5773805N)**



**Photo B-7: Looking at Class I (temporary) wetland; June 14 2023 (380283E, 5773728N)**



**Photo B-8: Looking west at Chappell Marsh, Class V (permanent) wetland; June 24, 2023 (378843E, 5773931N)**



**Photo B-9: Looking south at Chappell Marsh, wetland; June 24, 2023 (379086E, 5773931N)**



**Photo B-10: Looking south at example vegetation within the RSBBA; June 14 2023 (379185E, 5773770N)**

# APPENDIX

## C HABITAT TYPE DESCRIPTIONS



HABITAT TYPE	DESCRIPTION
Closed Canopy Deciduous Woodland	Dense deciduous tree cover with a thick overstory
Crop Land (Cultivated)	Land that is cultivated and/or seeded annually to produce grains, seeds or legumes
Disturbed/Developed	Land that is disturbed by construction activities either permanently or temporary
Disturbed/Gravel Pit	Gravel pit
Hay Crop (Forage)	Land that is cut/mowed annually to produce livestock forage
Native Dominant Grassland/Tame Grassland	Land that contains a relatively even mix or patchwork of native (grass, forb and shrub) and introduced (tame) grass species
Native Dominant Grassland	Land dominated by native grass, forb and shrub species that has not been cultivated, or historically broken land that has re-vegetated naturally with native species
Open Canopy Deciduous Woodland	Sparse deciduous tree cover with an open over story
Open Canopy Mixed Woodland	Sparse mixedwood (deciduous and coniferous) tree cover with an open over story. This cover type includes planted areas that are present at the Richard St. Barbe Baker Afforestation Area.
Tall Shrub Grassland	Grassland habitat dominated by Tall shrub (e.g., wolf willow [ <i>Elaeagnus commutata</i> ]) cover
Tame Grassland	Land that has a higher number of introduced species than native species because of encroachment or direct seeding. These areas may be dominated by introduced species such as smooth brome ( <i>Bromus inermis</i> )
Wetland	Land that is saturated with water for a long enough period to promote wetland or aquatic proces as indicated by poorly drained soils, hdrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment.
Yard Site	Active residence
Yard Site Abandoned/Tame Grassland	Abandoned residence with idle introduced grass species

Source: EDI 2021

# APPENDIX

## **D** OBSERVED VEGETATION IN THE RSBBA

## Observed Vegetation in the RSBBA (2019)

COMMON NAME	SCIENTIFIC NAME	LIFEFORM	SKCDC RANK <sup>(a)</sup>
absinthe	<i>Artemisia absinthium</i>	Forb	SNA
alfafa	<i>Medicago sativa</i> ssp. <i>sativa</i>	Forb	SNA
alkali grass	<i>Distichlis spicata</i>	Graminoid	S5
American elm	<i>Ulmus americana</i>	Tree	S4
American purple vetch	<i>Vicia americana</i> ssp. <i>americana</i>	Forb	S5
American red raspberry	<i>Rubus idaeus</i> ssp. <i>strigosus</i>	Shrub	S5
awned sedge	<i>Carex atherodes</i>	Graminoid	S4
balsam poplar	<i>Populus balsamifera</i> ssp. <i>balsamifera</i>	Tree	S5
basket willow	<i>Salix petiolaris</i>	Shrub	S4
bastard toadflax	<i>Comandra umbellata</i> ssp. <i>pallida</i>	Forb	S5
biennial wormwood	<i>Artemisia biennis</i> var. <i>biennis</i>	Forb	SNA
black medic	<i>Medicago lupulina</i>	Forb	SNA
blue spruce*	<i>Picea pungens</i>	Tree	SNA
buffalo-berry	<i>Shepherdia argentea</i>	Shrub	S4
Canada anemone	<i>Anemonastrum canadense</i>	Forb	S5
Canada goldenrod	<i>Solidago canadensis</i> var. <i>canadensis</i>	Forb	S5
Canada sagewort	<i>Artemisia campestris</i> ssp. <i>canadensis</i>	Forb	S3
Canada thistle	<i>Cirsium arvense</i>	Forb	SNA
Canadian milk-vetch	<i>Astragalus canadensis</i> var. <i>canadensis</i>	Forb	S4
chokecherry	<i>Prunus virginiana</i> var. <i>virginiana</i>	Shrub	S5
common caragana	<i>Caragana arborescens</i>	Shrub	SNA
common cattail	<i>Typha latifolia</i>	Forb	S4
common dandelion	<i>Taraxacum officinale</i> ssp. <i>officinale</i>	Forb	SNA
common horsetail	<i>Equisetum arvense</i>	Forb	S5
common knotweed	<i>Polygonum aviculare</i> ssp. <i>aviculare</i>	Forb	SNA
common plantain	<i>Plantago major</i>	Forb	SNA
common reed-grass	<i>Phragmites australis</i> ssp. <i>americanus</i>	Graminoid	S4
common yarrow	<i>Achillea millefolium</i>	Forb	S5
cream-coloured vetchling	<i>Lathyrus ochroleucus</i>	Forb	S5
creeping bellflower	<i>Campanula rapunculoides</i>	Forb	SNA
creeping spike-rush	<i>Eleocharis palustris</i>	Graminoid	S5
creeping wild rye	<i>Elymus repens</i>	Graminoid	SNA
crested wheatgrass	<i>Agropyron cristatum</i> ssp. <i>pectinatum</i>	Graminoid	SNA
cursed buttercup	<i>Ranunculus sceleratus</i> var. <i>multifidus</i>	Forb	S4
cut-leaved anemone	<i>Anemone multifida</i> var. <i>multifida</i>	Forb	S4
eastern cottonwood	<i>Populus deltoides</i>	Tree	S4
European buckthorn	<i>Rhamnus cathartica</i>	Shrub	SNA
field sow-thistle	<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Forb	SNA
Flodman's thistle	<i>Cirsium flodmanii</i>	Forb	S4
fowl blue grass	<i>Poa palustris</i>	Graminoid	S4
golden-bean	<i>Thermopsis rhombifolia</i>	Forb	S5



COMMON NAME	SCIENTIFIC NAME	LIFEFORM	SKCDC RANK <sup>(a)</sup>
green ash	<i>Fraxinus pennsylvanica</i>	Tree	S4
green foxtail	<i>Setaria viridis</i> var. <i>viridis</i>	Graminoid	SNA
green needlegrass	<i>Nassella viridula</i>	Graminoid	S5
gumweed	<i>Grindelia squarrosa</i>	Forb	SNR
hairy hedge-nettle	<i>Stachys pilosa</i> var. <i>pilosa</i>	Forb	S4
hard-stemmed bulrush	<i>Schoenoplectus acutus</i> var. <i>acutus</i>	Graminoid	S4
heart-leaved alexanders	<i>Zizia aptera</i>	Forb	S4
hoary golden aster	<i>Heterotheca villosa</i> var. <i>minor</i>	Forb	S5
june grass	<i>Koeleria macrantha</i>	Graminoid	S5
Kentucky blue grass	<i>Poa pratensis</i>	Graminoid	SNA
kochia	<i>Bassia scoparia</i>	Forb	SNA
lamb's-quarter's	<i>Chenopodium album</i> var. <i>album</i>	Forb	SNA
long-beaked willow	<i>Salix bebbiana</i>	Shrub	S4
long-fruited anemone	<i>Anemone cylindrica</i>	Forb	S4
long-styled anise-root	<i>Osmorhiza longistylis</i>	Forb	S5?
low goldenrod	<i>Solidago missouriensis</i>	Forb	S5
low prairie rose	<i>Rosa arkansana</i>	Shrub	S5
Manitoba maple	<i>Acer negundo</i> var. <i>interius</i> *	Tree	S5
meadow wild barley	<i>Hordeum jubatum</i> ssp. <i>intermedium</i>	Graminoid	S5
narrow-leaved meadow-sweet	<i>Spiraea alba</i> var. <i>alba</i>	Forb	S4
nodding thistle	<i>Carduus nutans</i> ssp. <i>leiophyllus</i>	Forb	SNA
northern bedstraw	<i>Galium boreale</i>	Forb	S5
northern reed grass	<i>Calamagrostis stricta</i>	Graminoid	S5
pasture sage	<i>Artemisia frigida</i>	Forb	S5
pineapple-weed	<i>Matricaria discoidea</i>	Forb	SNA
pink wintergreen	<i>Pyrola asarifolia</i> ssp. <i>asarifolia</i>	Forb	S5
poplar hybrid	<i>Populus hybrid</i>	Tree	SNA
prairie cinquefoil	<i>Potentilla pensylvanica</i>	Forb	S4
prairie sage	<i>Artemisia ludoviciana</i> ssp. <i>ludoviciana</i>	Forb	S5
rayless aster	<i>Symphyotrichum ciliatum</i>	Forb	S5
red elderberry	<i>Amaranthus californicus</i>	Forb	S2
red-osier dogwood	<i>Cornus sericea</i> ssp. <i>Sericea</i>	Shrub	S5
red-root pigweed	<i>Amaranthus retroflexus</i>	Forb	SNA
ross' sedge	<i>Carex rossii</i>	Graminoid	S4
sandbar willow	<i>Salix interior</i>	Shrub	S4
saskatoon	<i>Amelanchier alnifolia</i> var. <i>alnifolia</i>	Shrub	S5
scentless chamomile	<i>Tripleurospermum inodorum</i>	Forb	SNA
scotch pine	<i>Pinus sylvestris</i>	Tree	SNA
sea-milkwort	<i>Lysimachia maritima</i>	Forb	S4
seaside arrow-grass	<i>Triglochin maritima</i>	Graminoid	SNA
seaside buttercup	<i>Ranunculus cymbalaria</i>	Forb	S4
shepherd's-purse	<i>Capsella bursa-pastoris</i>	Forb	SNA
shiny cotoneaster	<i>Cotoneaster lucidus</i>	Shrub	SNA
short-awn meadow-foxtail	<i>Alopecurus aequalis</i> var. <i>aequalis</i>	Graminoid	S4
Siberian elm	<i>Ulmus pumila</i>	Tree	SNA
silverberry	<i>Elaeagnus commutata</i>	Shrub	S4
silverweed	<i>Potentilla anserina</i> ssp. <i>anserina</i>	Forb	S4

COMMON NAME	SCIENTIFIC NAME	LIFEFORM	SKCDC RANK <sup>(a)</sup>
silvery scurf pea	<i>Pedimelum argophyllum</i>	Forb	S5
skeleton-weed	<i>Lygodesmia juncea</i>	Forb	S5
small bedstraw	<i>Galium trifidum</i> ssp. <i>Trifidum</i>	Forb	S4
small-leaved pussy-toes	<i>Antennaria microphylla</i>	Forb	S5
smooth blue aster	<i>Symphyotrichum laeve</i> var. <i>geyeri</i>	Forb	S5
smooth brome	<i>Bromus inermis</i>	Graminoid	SNA
soft-stem bulrush	<i>Schoenoplectus tabernaemontani</i>	Graminoid	S4
starflower false solomon's-seal	<i>Maianthemum stellatum</i>	Forb	S4
stinging nettle	<i>Urtica dioica</i> ssp. <i>gracilis</i>	Forb	S4
sweet grass	<i>Anthoxanthum hirtum</i> ssp. <i>arcticum</i>	Graminoid	S4
tansy	<i>Tanacetum vulgare</i>	Forb	SNA
tartarian honeysuckle	<i>Lonicera tatarica</i>	Shrub	SNA
three-leaf solomon's-seal	<i>Maianthemum trifolium</i>	Forb	S4
three-square rush	<i>Schoenoplectus pungens</i>	Graminoid	S4
trembling aspen	<i>Populus tremuloides</i>	Tree	S5
tufted hair grass	<i>Deschampsia cespitosa</i> ssp. <i>cespitosa</i>	Graminoid	S4
tufted vetch	<i>Vicia cracca</i> ssp. <i>cracca</i>	Forb	SNA
tufted white prairie aster	<i>Symphyotrichum ericoides</i> var. <i>pansum</i>	Forb	S5
veiny meadow-rue	<i>Thalictrum venulosum</i>	Forb	S5
velvety goldenrod	<i>Solidago mollis</i>	Forb	S4
water smartweed	<i>Persicaria amphibia</i> var. <i>emersa</i>	Forb	S4
wavy-leaved thistle	<i>Cirsium undulatum</i> var. <i>undulatum</i>	Forb	S4
western dock	<i>Rumex occidentalis</i>	Forb	S5
western snowberry	<i>Symphoricarpos occidentalis</i>	Shrub	S5
western wheatgrass	<i>Pascopyrum smithii</i>	Graminoid	S5
white paniced american-aster	<i>Symphyotrichum lanceolatum</i> var. <i>hesperium</i>	Forb	S4
white spruce	<i>Picea glauca</i>	Tree	S5
white sweet-clover	<i>Mellilotus albus</i>	Forb	SNA
wild black currant	<i>Ribes americanum</i>	Shrub	S4
wild honeysuckle	<i>Lonicera dioica</i>	Shrub	S5
wild licorice	<i>Glycyrrhiza lepidota</i>	Forb	s4
wild mint	<i>Mentha canadensis</i>	Forb	SNA
wood's rose	<i>Rosa woodsii</i> var. <i>woodsii</i>	Shrub	S5
yellow alfalfa	<i>Medicago sativa</i> ssp. <i>falcata</i>	Forb	SNA
yellow goat's-beard	<i>Tragopogon dubius</i>	Forb	SNA
yellow sweet-clover	<i>Mellilotus officinalis</i>	Forb	SNA
yellow toad-flax	<i>Linaria vulgaris</i>	Forb	SNA

Source: EDI 2021

Notes: a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC 2023a)

S4 = Apparently Secure; uncommon but not rare; S3 = Vulnerable / Rare to Uncommon; at moderate risk of extinction or extirpation due to restricted range, relatively few populations, recent and widespread declines, threats, or other factors; S2 = Imperiled / Very Rare; at high risk of extinction or extirpation due to a very restricted range, very few populations, steep declines, threats or other factors, S1 = Critically Imperiled / Extremely Rare; at very high risk of extinction or extirpation due to extreme rarity, very steep declines, high threat level, or other factors.

# APPENDIX

# E TRACKED VASCULAR PLANT SPECIES IN THE SASKATOON PLAIN ECOREGION

Tracked Vascular Plant Species in the Saskatoon Plain (K08)

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK
American bugseed	<i>Corispermum americanum</i> var. <i>americanum</i>	S3
awned cyperus	<i>Cyperus squarrosus</i>	S3
blue wild rye	<i>Elymus glaucus</i> ssp. <i>glaucus</i>	S3
blueflag	<i>Iris versicolor</i>	S1
bristle-leaved sedge	<i>Carex eburnea</i>	S3
bristly gooseberry	<i>Ribes oxyacanthoides</i> var. <i>setosum</i>	S2
bushy cinquefoil	<i>Potentilla supina</i> ssp. <i>paradoxa</i>	S3
California amaranth	<i>Amaranthus californicus</i>	S2
chaffweed	<i>Anagallis minima</i>	S3
Columbia needlegrass	<i>Achnatherum nelsonii</i> ssp. <i>dorei</i>	S3
Crawe's sedge	<i>Carex crawei</i>	S3
crowfoot violet	<i>Viola pedatifida</i>	S3
dry goosefoot	<i>Chenopodium desiccatum</i>	S3
dwarf clubrush	<i>Trichophorum pumilum</i>	S1
early cinquefoil	<i>Potentilla concinna</i> var. <i>concinna</i>	S2
Engelmann's spike-rush	<i>Eleocharis engelmannii</i>	S3
false spikenard	<i>Maianthemum racemosum</i> ssp. <i>amplexicaule</i>	S1
few-flowered aster	<i>Almutaster pauciflorus</i>	S3
great solomon's seal	<i>Polygonatum biflorum</i> var. <i>commutatum</i>	S2
hairy bugseed	<i>Corispermum villosum</i>	S2
hairy germander	<i>Teucrium canadense</i> var. <i>occidentale</i>	S3
Hooker's bugseed	<i>Corispermum hookeri</i> var. <i>hookeri</i>	S2
Hudson's cinquefoil	<i>Potentilla hudsonii</i>	S2
lesser duckweed	<i>Lemna minor</i>	S1
little yellow-rattle	<i>Rhinanthus minor</i> ssp. <i>minor</i>	S3
longstem water-wort	<i>Elatine triandra</i>	S2
low whitlowwort	<i>Paronychia sessiliflora</i>	S3
Macoun's gentian	<i>Gentianopsis virgata</i> ssp. <i>macounii</i>	S3
marsh felwort	<i>Lomatogonium rotatum</i> var. <i>fontanum</i>	S3
Menzies' catchfly	<i>Silene menziesii</i>	S3
mingan moonwort	<i>Botrychium minganense</i>	S1
mucronate blue-eyed-grass	<i>Sisyrinchium mucronatum</i>	S3
narrow-leaved water plantain	<i>Alisma gramineum</i>	S3
northern blue-eyed-grass	<i>Sisyrinchium septentrionale</i>	S3
pale moonwort	<i>Botrychium pallidum</i>	S1
pallas' bugseed	<i>Corispermum pallasii</i>	S2
Plains rough fescue	<i>Festuca hallii</i>	S3
prairie dunewort	<i>Botrychium campestre</i>	S3
pursh's milk-vetch	<i>Astragalus purshii</i> var. <i>purshii</i>	S3

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK
American bugseed	<i>Corispermum americanum var. americanum</i>	S3
awned cyperus	<i>Cyperus squarrosus</i>	S3
blue wild rye	<i>Elymus glaucus ssp. glaucus</i>	S3
blueflag	<i>Iris versicolor</i>	S1
bristle-leaved sedge	<i>Carex eburnea</i>	S3
bristly gooseberry	<i>Ribes oxyacanthoides var. setosum</i>	S2
bushy cinquefoil	<i>Potentilla supina ssp. paradoxa</i>	S3
red bulrush	<i>Blysmopsis rufa</i>	S3
red-stemmed cinquefoil	<i>Potentilla rubricaulis</i>	S3
Rocky Mountain sedge	<i>Carex saximontana</i>	S3
sandhills cinquefoil	<i>Potentilla lasiodonta</i>	S2
small dropseed	<i>Sporobolus neglectus</i>	S2
small yellow lady's slipper	<i>Cypripedium parviflorum var. makasin</i>	S3
smooth hawk's-beard	<i>Crepis runcinata ssp. hispidulosa</i>	S1
soft wild bergamot	<i>Monarda fistulosa var. mollis</i>	S3
striped coral-root	<i>Corallorhiza striata var. striata</i>	S3
tall blue lettuce	<i>Lactuca biennis</i>	S3
tall bur-marigold	<i>Bidens frondosa</i>	S3
upland white goldenrod	<i>Solidago ptarmicoides</i>	S3
water pimpernel	<i>Samolus parviflorus</i>	SH
Yukon silverweed	<i>Potentilla anserina ssp. yukonensis</i>	S2

Notes: a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC 2023a).

S4 = Apparently Secure; uncommon but not rare, S3 = Vulnerable / Rare to Uncommon; at moderate risk of extinction or extirpation due to restricted range, relatively few populations, recent and widespread declines, threats, or other factors, S2 = Imperiled / Very Rare; at high risk of extinction or extirpation due to a very restricted range, very few populations, steep declines, threats or other factors, S1 = Critically Imperiled / Extremely Rare; at very high risk of extinction or extirpation due to extreme rarity, very steep declines, high threat level, or other factors.

# APPENDIX

# F

OBSERVED  
WILDLIFE SPECIES



## Observed Wildlife Species in the RSBBA

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	COSEWIC STATUS	SARA STATUS
<b>BIRDS</b>				
American crow	<i>Corvus brachyrhynchos</i>	S4	-	-
American goldfinch	<i>Spinus tristis</i>	S5B	-	-
American kestrel	<i>Falco sparverius</i>	SB, S1N	-	-
American robin	<i>Turdus migratorius</i>	S5B SUN	-	-
Baltimore oriole	<i>Icterus galbula</i>	S5B	-	-
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	S5B	-	-
black-billed magpie	<i>Pica hudsonia</i>	S5	-	-
black-capped chickadee	<i>Poecile atricapillus</i>	S5	-	-
brown-headed cowbird	<i>Molothrus ater</i>	S5B,SUN	-	-
blue jay	<i>Cyanocitta cristata</i>	S5	-	-
blue-winged teal	<i>Spatula discors</i>	S5B	-	-
Canada goose	<i>Branta canadensis</i>	S5B	-	-
canvasback	<i>Aythya valisineria</i>	S5B	-	-
cedar waxwing	<i>Bombycilla cedrorum</i>	S5B	-	-
clay-coloured sparrow	<i>Spizella pallida</i>	S5B	-	-
chipping sparrow	<i>Spizella passerina</i>	S5B	-	-
common grackle	<i>Quiscalus quiscula</i>	S5B	-	-
common nighthawk	<i>Chordeiles minor</i>	S4B	Special Concern	Threatened
common yellowthroat	<i>Geothlypis trichas</i>	S5B	-	-
common raven	<i>Corvus corax</i>	S5	-	-
horned grebe	<i>Podiceps auritus</i>	S5B	-	-
gadwall	<i>Mareca strepera</i>	S5B	-	-
house finch	<i>Haemorhous mexicanus</i>	S4B	-	-
house wren	<i>Troglodytes aedon</i>	S5B	-	-
killdeer	<i>Charadrius vociferus</i>	S5B	-	-
least flycatcher	<i>Empidonax minimus</i>	S5B	-	-
lesser scaup	<i>Aythya affinis</i>	S5B	-	-
marbled godwit	<i>Limosa fedoa</i>	S4B	-	-
mallard	<i>Anas platyrhynchos</i>	S5B	-	-
northern shoveler	<i>Spatula clypeata</i>	S5B	-	-
ring-billed gull	<i>Larus delawarensis</i>	S5B	-	-
red-breasted nuthatch	<i>Sitta canadensis</i>	S5B,S5N,S5M	-	-
redhead	<i>Aythya americana</i>	S5B	-	-
red-eyed vireo	<i>Vireo olivaceus</i>	S5B	-	-
red-tailed hawk	<i>Buteo jamaicensis</i>	S5B,S1N,	Not at Risk	-
red-winged blackbird	<i>Agelaius phoeniceus</i>	S5B,SUN	-	-
Rock pigeon				

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(a)</sup>	COSEWIC STATUS	SARA STATUS
savannah sparrow	<i>Passerculus sandwichensis</i>	S5B	-	-
sora	<i>Porzana carolina</i>	S5B	-	-
song sparrow	<i>Melospiza melodia</i>	S5B	-	-
swainson's thrush	<i>Catharus ustulatus</i>	S5B	-	-
tree swallow	<i>Tachycineta bicolor</i>	S5B	-	-
vesper sparrow	<i>Poocetes gramineus</i>	S5B	-	-
western meadowlark	<i>Sturnella neglecta</i>	S5B	-	-
willet	<i>Tringa semipalmata</i>	S4B	-	-
wilson's snipe	<i>Gallinago delicata</i>	S5B	-	-
Yellow-headed blackbird				
yellow warbler	<i>Setophaga coronata</i>	S5B	-	-
yellow-rumped warbler	<i>Setophaga coronata</i>	S5B	-	-
<b>MAMMALS</b>				
coyote	<i>Canis latrans</i>	S5	-	-
elk	<i>Cervus elaphus</i>	S4	-	-
moose	<i>Alces alces</i>	S5	-	-
mule deer	<i>Odocoileus hemionus</i>	S4	-	-
North American porcupine	<i>Erethizon dorastum</i>	S4S5	-	-
raccoon	<i>Procyon lotor</i>	S5	-	-
red squirrel	<i>Tamiasciurus hudsonicus</i>	S5	-	-
red fox	<i>Vulpes vulpes</i>	S5	-	-
snowshoe hare	<i>Lepus americanus</i>	S5	-	-
white-tailed deer	<i>Odocoileus virginianus</i>	S4	-	-

Notes: a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC 2023a).





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# ACTIONS SUMMARY

## ACTIONS SUMMARY – RICHARD ST. BARBE BAKER AFFORESTATION AREA

\*TBD refers to Action categories which may be considered for each Strategy in the future yet are not applicable at this time.

### Strategy #1: Baseline Collection & Data Management

ACTION #	ACTION	MEASUREMENT OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> Perform data collection per the “Planning & Implementation” Action below.				
2.	<b>Planning &amp; Implementation</b> 2.1 Baseline Collection: Develop and initiate plan with the intention to identify and complete baseline studies required to support the applicable objective or tasks outlined in the Natural Area Management Plan (NAMP). Targeted biophysical information collection should include, but is not limited to: detailed rare flora data such as specific population location(s), individual and population counts (a requirement for calculating the Shannon-wiener diversity index), general population spatial extents for tracking purposes, possible future enhancement areas, individual weed locations (by species), and spatial distribution across the entire site; species specific faunal surveys to capture more detailed information regarding presence of critical habitat present that may support all lifecycle stages of identified Species of Management Concern (SOMC), general movement to support current and future wildlife passage/connectivity needs, and identification of key habitat areas to assist in the conservation and subsequent monitoring of species of conservation concern. Field investigation and baseline data collection will also need to support any hydrological analysis and associated development planning, as completed. 2.2 Data Management System: Establish collection, sharing and storage protocols for biophysical/monitoring data acquisition. Digital collection and storage should take into consideration the greater Meewasin Valley Authority initiative(s). Data sharing with applicable organizations, such as the Saskatchewan Conservation Data Centre, iMap Invasives and iNaturalist and should be considered in the collection methods employed. To maintain up to date datasets, uploads should occur routinely (minimum annually). Review data for SOMC’s – protocol in place for detecting.	Baseline studies complete.	Identification of baseline studies and plan to execute. Short-term.  Execution of baseline studies Mid-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	Short-term.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Establish and implement partnerships, such as Meewasin Valley Authority, to share and collect data. 4.2 Establish and implement community stewardship opportunities to collect and/or share data.	Partnerships established, data collected and shared.  Community Stewardship initiatives established, data collected and shared.	Mid-term.  Mid-term.		
5.	<b>Engagement Initiatives</b> 5.1 As part of engagement activities, consider sharing with stakeholders the Baseline Collection and Data Management initiatives to provide transparency and cultivate opportunities for partnerships and community stewardship.	Plan(s) shared, and status regularly updated.	Long-term.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Provide opportunities for educational, training, and research initiatives related to data collection. Data from initiatives should be collected as part of Data Management.	Educational, training, and research initiatives identified, planned for, initiated, and data managed.	Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Plan for, and undertake subsequent detailed biophysical inventories, at select permanent sampling locations established during baseline data collection initiatives to confirm site health and general management trajectories.	Baseline studies and tasks specific monitoring completed and updated, as required.	Five-year frequency should be targeted. Long-term.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Coordinate with the City's Climate Action Team to define specific climate change mitigation initiatives that are needed to reduce climate-related risks to the site.	Climate mitigation measures understood and adhered to.	Short-term.		



## Strategy #2: Policy, Urban Planning, and Enforcement

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Per Strategy #1.				
2.	<b>Planning &amp; Implementation</b> 2.1 Land Acquisition: Promote greater resilience and resistance to urban development pressures in the Meewasin Valley that may be identified during current and future urban planning exercises through site expansion. An initial targeting map should be developed that highlights areas of interests in proximity to the site in order to inform the intent to acquire as lands becomes available, funds permitting. Should priority conservation lands be identified in close proximity to the site, consider expanding current boundary to include them. Acquire additional land in key locations that expand the ecological significance of the site.	Ongoing land acquisition.	Identification of target areas – Short term.  Acquisition and jurisdiction permitting - Long-term, or when available.		
	2.2 Land Use Designation: Assess and designate site for applicable land use. To be used to guide future uses and management of the site, in conjunction with the recommendations of the NAMP.	Land use dedicated and managed accordingly.	Short-term.		
	2.3 Enforcement: Plan and implement the enforcement of the bylaws and prohibited uses of the site.	Bylaws are enforced.	Long-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Activity.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Educate and collaborate with future developers or landowners adjoining and adjacent to the site, or between the site and other natural areas. Future adjacent developments/land use changes should be planned in accordance with the objectives set by this plan; and any current/ future planning policies developed for the general retention and sustainability of a natural area.	Partnerships established and future land use changes outside of the site are established in accordance with the NAMP.	At initiation of planning for off-site development.		
5.	<b>Engagement Initiatives</b> 5.1 Engage with the public regarding the land acquisition, land use designation, and enforcement of the bylaws with the intention to inform the public.	Public kept informed of changes to the site.	Long-term.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Provide education or training where possible to engage the public to act responsibly and reinforce bylaws.	Public kept informed of changes to the site.	Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitor success of initiatives.	Education and training initiatives developed and implemented.	Mid-term.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 Bylaws and recommended prohibited uses of the site to be enforced by the City of Saskatoon.	All laws and guidelines adhered to.	In conjunction with all Actions.		
	8.2 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> TBD				



### Strategy #3: Buffering of Adjacent Lands

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> TBD				
2.	<b>Planning &amp; Implementation</b> 2.1 Buffering Initiatives On-site: Plan and implement buffering initiatives on-site (as required) to protect the site from adjacent incompatible land uses. Buffering initiatives to consider mitigation of human disturbance, such as noise and sound pollution, unprotected access to the site, and run-off. Buffering methods on site to consider strategic planting along the property line of the site, such as along the CN Rail Yards.	Plan and implementation of buffering initiatives on-site.	Planning – Short-term.  Implementation – Short/Mid-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Activity.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Collaborate with adjacent landowners and engage with stakeholders to identify, plan, and implement buffers. The following are recommended buffering initiatives could be considered: – Lighting adjacent to the site should be dark-sky compliant (off-site). – Uncontrolled run-off into the site should be prohibited and managed by the adjacent properties (off-site).	Partnerships established and off-site buffers and mitigation measures in place.	Planning – Short-term.  Implementation – Short/Mid-term		
5.	<b>Engagement Initiatives</b> 5.1 Engage per Action 6.				
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Provide and maintain educational signage throughout the site to inform visitors and adjacent residents about the impacts they may have on the site such as: signage on the impact of domestic pets on wildlife, spread of weeds, and herbicides.	Educational signage installed and maintained.	Infrastructure installed – Short term.		
	6.2 Consider developing fact sheet(s) series regarding conservation opportunities proposed and completed, implications regarding the use of impactful substances (e.g., herbicides and insecticides), invasive species identification and control (e.g., regulated weeds, damaging wildlife such as wild boars), risk of domestic animals to wildlife, and other applicable best management practices required to sustainably manage the site. Make available on City website or other platforms for public consumption.	Educational content provided to residents.	Maintained- Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitor the success of the Buffering Initiatives and threats posed by future off-site developments. Maintain any proposed infrastructure should it be located on-site. Adjust management techniques as required to mitigate threats.	On-site buffering initiatives maintained, monitored, and adapted as required.	Long-term.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. This includes but is not limited to: the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Consider the effects of climate change at every opportunity, including when choosing materials for the Buffering Initiatives infrastructure.	Climate change considered in initiative.	In conjunction with planning.		

## Strategy #4: Enhancement & Improvement

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Data collected per Strategy #1.				
2.	<b>Planning &amp; Implementation</b> 2.1 Restoration/Reclamation: Plan and implement site-specific reclamation/restoration plans for the enhancement or improvement of the ecological communities. Planning to include: <ul style="list-style-type: none"> <li>– Development of restoration framework, conceptual plan for restoration or reclamation activities, and master list of restoration opportunities to guide enhancement and improvement activities in accordance with the NAMP. Planning to consider: Reclaiming areas of existing degradation and poor health identified through baseline survey(s); Enhancing areas of fair or good health identified through baseline survey(s).</li> <li>– Development and implementation of detailed restoration/reclamation plans based on the framework, conceptual plan, and master list. Restoration/reclamation plans to include, but not limited to: <ul style="list-style-type: none"> <li>– Specific restoration/reclamation locations.</li> <li>– Goals and objectives to meet the recommended per the defined Reference Ecosystem(s) and Restoration Feasibility in Section 5 – Conservation Plan.</li> <li>– Strategy for implementation.</li> <li>– Timeframe for execution.</li> <li>– Monitoring to confirm results.</li> <li>– Increasing quantity of native species in areas of inadequate representation.</li> <li>– Increasing size of native-dominant vegetation communities proportions and expanding patches where appropriate.</li> <li>– Supporting native wildlife habitat.</li> <li>– Reduction of non-native species.</li> <li>– Use of only native species in planting prescriptions.</li> <li>– Prioritize locally sourced seed and plant materials, where possible.</li> <li>– Consider the use of culturally significant native plants, where appropriate.</li> </ul> </li> </ul>	Restoration/reclamation framework, conceptual plan, master list, and detailed designs implemented.	Planning – Short-term.  Implementation – Short/Mid-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Action.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Continue to support the inter-agency native seed co-operative and native plant propagation program as described in the Meewasin Valley-wide Resource Management Plan (Meewasin, 2017).	Partnership and genetics secured.	Long-term.		
	4.2 Cultivate volunteer opportunities to assist with initiatives, such as planting days.	Community stewardship opportunities engaged.	Long-term.		
5.	<b>Engagement Initiatives</b> 5.1 As part of the planning, implementation, and monitoring for success, engage with stakeholders to gain feedback on restoration initiatives and success. Engagement throughout the construction phases is recommended to provide information and awareness of the planned activities.	Stakeholders engaged and aware of initiatives.	Mid-term.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Plan and initiate an outreach program to raise awareness of restoration efforts, including signage, fact sheets, and educational opportunities.	Public educated about initiatives, and research initiatives in place.	Long-term.		
	6.2 Consider opportunities to conduct research projects with the University of Saskatchewan that may be linked to any enhancement or restoration opportunities developed.	Opportunities with the university identified and implemented.	Mid-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Success of restoration/reclamation initiatives monitored, maintained, and adaptively managed long-term.	Efforts are monitored, maintained, and adaptively managed.	Long-term.		
8.	<b>Adherence to Laws and Guidelines</b>	All laws and guidelines adhered to.			



ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
	8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.		In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Consider climate change mitigation measures when planning for restoration/reclamation activities, including such considerations as hardiness of plants for a changing climate, securing and/or sourcing native genetic material, drought tolerant plants.	Climate change mitigation measures considered in planning and management of the initiatives.	In conjunction with planning.		



## Strategy #5: Invasive & Undesirable Species Management

ACTION #	ACTION	MEASUREMENT OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Complete inventory of weed species in accordance with Strategy #1.	Data collected.	Short-term.		
2.	<b>Planning &amp; Implementation</b> 2.1 IPM Plan: Develop and implement species-specific integrated pest management (IPM) plan for: <ul style="list-style-type: none"> <li>– The reduction or elimination of provincially prohibited, noxious, and/or nuisance species that may be observed at any given time within the site.</li> <li>– The reduction of undesirable species that may be observed at any given time within the site.</li> <li>– The reduction of the impact and spread of invasive animal species (e.g., wild boar) as they are discovered near or in the site.</li> </ul>	Plan developed.  Implementation of plan.	Planning – Short-term  Implementation – Short-term.		
3.	<b>Financing</b> 3.1 Secure funding to develop IPM plans. Secure funding (annually) to conduct regular IPM screening, and targeted management.	Funding secured.	Following development of IPM Plan.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Develop potential partnerships and community stewardship opportunities to implement and monitor the IPM plan(s), such as community invasive species removal events, or awareness campaigns.	Partnerships identified and initiated.	In conjunction with IPM Plan.		
5.	<b>Engagement Initiatives</b> 5.1 Engage with the stakeholders during the development, implementation, and monitoring of the IPM plans to capture the stakeholder's comments and concerns. Implement and monitor the success of the initiative.	Stakeholders engaged.	In conjunction with IPM Plan.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Develop educational programs, training opportunities, and research opportunities to support the IPM Plan, such as: campaign to educate the public on the spread of weeds, informational signage posted within the site, and weed identification training provided.	Engagement and awareness of public.	In conjunction with IPM Plan.		
7.	<b>Monitoring, Maintenance, and Adaptive Management</b> 7.1 Undertake all invasive, nuisance, prohibited, noxious, and/or undesirable species monitoring following data and sampling techniques in accordance with any established strategies generated by Meewasin and available industry accepted practices at the time of monitoring.	Ongoing monitoring, maintenance, and adaptive management.	Following implementation of IPM Plan.		
8.	<b>Adherence to Laws &amp; Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	Initiatives adhere to laws and guidelines.	In conjunction with IPM Plan.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Planning, implementation, monitoring, and management of the IPM initiatives to take potential Climate Change Mitigation Measures into account. For example, consider preparing for introduced invasive species which are naturally migrating to Saskatoon as the climate shifts.	Climate change mitigation measures initiated.	In conjunction with IPM Plan.		

## Strategy #6: Natural Disturbance Regime Management

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Per Strategy #1.				
2.	<b>Planning &amp; Implementation</b> 2.1 Natural Disturbance Plan: Develop a natural disturbance program detailing the frequency, percentage of disturbance and cycling of disturbed areas that includes conservation grazing, prescribed burning strategies or other industry accepted strategies to promote active nutrient cycling and thatch management. For example, the City should adopt the use of pre-established native conservation grazing program(s) or select prescribed burning practices promoted by Meewasin to introduce controlled natural disturbance(s) to maintain healthy native grassland and wetland communities located within the site.	Plan developed and implemented.	Planning – Short-term.  Implementation – Mid-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Activity.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Consider partnerships and community stewardship initiatives to support the Natural Disturbance Plan, such as partnerships with local fire safety groups or Meewasin to educate the public on controlled burns.	Partnerships and community stewardship initiatives identified and initiated.	In conjunction with planning.		
5.	<b>Engagement Initiatives</b> 5.1 Engage the public prior to initiating natural disturbance regimes with the intention of education.	Public engaged.	In conjunction with planning.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Educational program developed in conjunction to educate public on the need, frequency and expectations surrounding natural disturbance regime management for the site. Education should include what to expect and links to useful info on the disturbance management plan tools that may be employed, including but not limited to controlled fires, conservation grazing, and mechanical pruning/mowing.	Public educated on natural disturbance regimes.	In conjunction with planning.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitoring, maintenance, and adaptive management initiatives to be incorporated into a Natural Disturbance Plan and implemented per plan.	Ongoing monitoring, maintenance, and adaptive management.	In conjunction with planning.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> TBD				





## Strategy #7: SOMC (Flora & Fauna) Management

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Per Strategy #1. Establish a baseline of the location and population extent of confirmed, rare, and species of management concern (SOMC) flora and fauna residing within the site to develop subsequent strategies for enhancement, or population maintenance.	Data collected.	Short-term.		
2.	<b>Planning &amp; Implementation</b> 2.1 SOMC Plans: Once baseline data is available, develop plans to enhance or maintain habitat for wildlife and identified SOMC through the integrated management approach established as part of the Meewasin Valley-wide Resource Management Plan (Meewasin, 2017). Plans should cover at a minimum, general wildlife use by birds, mammals, pollinators, amphibians; and specific natural infrastructure such as nesting and roosting places (if warranted). SAR-specific plans to consider all viable habitat for full life cycle support, if present and applicable.	Plans developed and implemented.	Planning – Short-term.  Implementation – Short-term.		
	2.2 Coordinate other tasks with SOMC objective(s) considered. All operational, maintenance, and plans executed on site adhere to any applicable restricted activity periods (RAP), nor accidentally harm the SOMC or associated habitat(s). Establish offsets (e.g., temporary, or permanent buffers) to known SOMC based on known locations, mitigation methods, and prescribe work outside of the known RAPs if applicable when conducting the described.	SOMC restrictions included in all future planning.	In conjunction with other Actions and Strategies.		
3.	<b>Financing</b> 3.1 Secure funding to conduct baseline inventories, develop, execute, and undertake required monitoring for general and SAR-specific wildlife management planning.	Funding secured.	Mid-term.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Community stewardship communities to be considered to monitor sightings of SOMC, and volunteer to educate the public on SOMC.	Community stewardship initiatives implemented.	Long-term.		
5.	<b>Engagement Initiatives</b> 5.1 See education.				
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Educate adjacent land-users about the risks to SOMC, including that of letting pets roam freely.	Education and training initiatives implemented.	Long-term.		
	6.2 Consider training opportunities for volunteers to identify SOMC and collect data useful for the management of the plans.	Education and training initiatives implemented.	Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitor, maintenance, and adaptive management initiatives to be incorporated into SOMC plans and implemented per plan.	Ongoing monitoring, maintenance, and adaptive management.	In conjunction with planning.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Include climate change mitigation initiatives in future SOMC plans. Consider the effects of climate change on SOMC and potential mitigation measures.	Climate change mitigation measures identified and implemented.	In conjunction with planning.		



## Strategy #8: Historically and Culturally Significant Species & Features Management

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Per Strategy #1. Complete general site inventory for culturally significant species and features, and historically significant features and artefacts.	Data collected.	Short-term.		
2.	<b>Planning &amp; Implementation</b> 2.1 Cultural and Historical Plan: Develop and implement plan to identify, protect, and enhance culturally significant species and features, and historically significant features. Plan to highlight the importance of Richard St. Barbe Baker, the Afforestation initiatives, the history of the site and site uses, the Indigenous significance of the site, and culturally significant species management.	Plans developed and implemented.	Planning – Short-term. Implementation – Mid-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times to support all the required planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Activity.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Develop community stewardship initiatives in conjunction with engagement initiatives.	Community stewardship initiatives implemented.	Long-term.		
5.	<b>Engagement Initiatives</b> 5.1 Engage with appropriate Indigenous organizations to identify culturally significant considerations and desires for the site. Including, but not limited to culturally significant species, and desired use(s) of species.	Engagement complete.	Short-term.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Plan and implement educational content to relay historical and cultural significance of the site to the public. Install recommended infrastructure, such as signage, funding permitting.	Education and training initiatives implemented.	Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitoring, maintenance, and adaptive management initiatives to be incorporated into SOMC plans and implemented per plan.	Ongoing monitoring, maintenance, and adaptive management.	In conjunction with planning.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Explore the impacts of climate change on cultural and historically significant species and features. Adapt mitigation measures where possible.	Climate change mitigation measures identified and implemented.	In conjunction with planning.		



## Strategy #9: Water Management

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Per Strategy #1. Determine and subsequently select a pre-development hydrological baseline for use in all future hydrological balancing activities.	Data collected.	Short-term.		
2.	<b>Planning &amp; Implementation</b> 2.1 Hydrological Management Plan: determine and understand any constraints for waterflow between the Chappel Marsh and wetlands on site. Additionally, research catchment areas within and surrounding the site. See Appendix D for recommendations regarding hydrology and water management.	Plans developed and implemented.	Planning – Short-term.  Implementation – Short-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities not covered by the adjacent development(s) as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Activity.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Identify partnership opportunities which may include Ducks Unlimited Canada or the Rural Municipality of Corman Park to develop watershed protection initiatives.	Collaboration with partners.	Long-term.		
5.	<b>Engagement Initiatives</b> 5.1 Engage with the stakeholders during the planning, implementation, and monitoring phases of the plans.	Engagement complete.	Short-term.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Plan and implement educational content to relay historical and cultural significance of the site to the public. Install recommended infrastructure, such as signage, funding permitting.	Education and training initiatives implemented.	Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitor, maintenance, and adaptive management initiatives to be incorporated into water management plans and implemented per plan.	Ongoing monitoring, maintenance, and adaptive management.	In conjunction with planning.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 Include the following requirement for all future infrastructure planning: All activities and installed infrastructure physically within 30m of identified wetlands located within the site or an identified catchment shall be undertaken pursuant the City of Saskatoon Wetland Policy.	All laws and guidelines adhered to.	In conjunction with all Actions.		
	8.2 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Explore the impacts of climate change on the wetlands and stormwater systems. Adapt mitigation measures where possible.	Climate change mitigation measures identified and implemented.	In conjunction with planning.		

## Strategy #10: Ecological Connectivity Management

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<p><b>Data Collection</b></p> <p>1.1 Per Strategy #1. Complete a targeted wildlife movement inventory for species that may have habitat ranges that encapsulate lands beyond the site (e.g., ungulates, and most mid to large sized predators). Data collected should inform future infrastructure and neighborhood planning within and adjacent to the site.</p>	Data collected.	Short-term.		
2.	<p><b>Planning &amp; Implementation</b></p> <p>2.1 Intra Connectivity Plan: Develop and implement intra-connectivity plan to protect and enhance intra-connectivity for wildlife and vegetation within the site. Consider intra-connectivity impacts when undertaking all infrastructure installations planned within the site. Future activities should consider:</p> <ul style="list-style-type: none"> <li>- Avoiding known wildlife habitat for identified SOMC.</li> <li>- Proximity to well-used game trails located within the site.</li> <li>- Limited use of infrastructure and hardscape in areas of small mammals and anuran use.</li> <li>- Infrastructure orientation to reduce barrier impact to sensitive areas frequented by small mammals and anurans.</li> <li>- Avoid and at worse case, limit habitat fragmentation.</li> </ul> <p>2.2 Inter-Connectivity Plan: Develop and implement an inter-connectivity plan to assist the migration of wildlife between the RSBBA and other natural areas.</p> <p>Although, wildlife movement studies have not detected any obvious trends or patterns of wildlife movement. Wildlife was observed to cross Township Road 362A and moving between the Class V wetland and the Chappell Marsh Conservation Area. Therefore, an inter-connectivity plan should be considered in conjunction with adjacent landowners (e.g., Chappell Marsh) for inter-connectivity between the site and other retained natural areas. Current and future plan(s) should consider:</p> <ul style="list-style-type: none"> <li>- Regional wildlife-specific movement pattern, if identified during future baseline data collection studies</li> <li>- Evaluation and subsequently installation of 'wildlife' connections (if required).</li> <li>- Evaluate the need and subsequently develop (if required) wildlife connections through the future developments to maintain post-development 'movement' between the site and other adjacent natural features.</li> </ul> <p>Identification and subsequent mitigation of current and future impacts to wildlife movement that adjacent road(s) may represent in a post development landscape.</p>	Plans developed and implemented.	<p>Planning – Short-term.</p> <p>Implementation – Mid-term.</p>		
3.	<p><b>Financing</b></p> <p>3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.</p>	Funding secured.	In conjunction with applicable Activity.		
4.	<p><b>Partnerships &amp; Community Stewardship Initiatives</b></p> <p>4.1 Develop community stewardship initiatives in conjunction with engagement initiatives.</p>	Community stewardship initiatives implemented.	Long-term.		
5.	<p><b>Engagement Initiatives</b></p> <p>5.1 Engage stakeholders and adjacent developers during the planning stages.</p>	Engagement complete.	Short-term.		
6.	<p><b>Education, Training, and Research Initiatives</b></p> <p>6.1 Educate the public on ecological connectivity, provide training opportunities for such things as data collection, and allow for research opportunities.</p>	Education, training, and research initiatives implemented.	Long-term.		
7.	<p><b>Monitoring, Maintenance, and Adaptive Management Initiatives</b></p> <p>7.1 Monitor, maintenance, and adaptive management initiatives to be incorporated into Ecological Connectivity plans and implemented per plan.</p>	Ongoing monitoring, maintenance, and adaptive management.	In conjunction with planning.		
8.	<p><b>Adherence to Laws and Guidelines</b></p> <p>8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.</p>	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<p><b>Climate Change Mitigation Initiatives</b></p> <p>9.1 Explore the impacts of climate change on Ecological Connectivity. Adapt mitigation measures where possible.</p>	Climate change mitigation measures identified and implemented.	In conjunction with planning.		



## Strategy #11: Human Use Programming

ACTION #	ACTION	MEASURE OF COMPLETION	ACTION PRIORITY	RESPONSIBILITY	PROGRESS
1.	<b>Data Collection</b> 1.1 Per Strategy #1.	Data collected.	Short-term.		
2.	<b>Planning &amp; Implementation</b> 2.1 Human-Use Plan: Develop and implement human-use plan which is complimentary to the Conservation Targets. Human-use plan to be in the form of a Conceptual and Detailed Design plans. Plans to include Required infrastructure, programming, and maintenance considerations. Implementation of the plans to consider the implications to the Conservation Targets and provide mitigation measures to reduce or eliminate negative impacts. Human use programming is recommended to include: <ul style="list-style-type: none"> <li>- Controlled site access improvements, including perimeter fencing.</li> <li>- Circulation route &amp; nodes.</li> <li>- Off-leash dog park improvements.</li> <li>- Skills park improvements.</li> <li>- Fat tire and adaptive mountain biking improvements.</li> <li>- Gathering area.</li> <li>- Wetland outlook.</li> <li>- Communications programming (i.e. signage).</li> <li>- Site furniture, including waste receptacles and seating.</li> </ul>	Plans developed and implemented.	Planning – Short-term.  Implementation – Short-term to Long-term.		
3.	<b>Financing</b> 3.1 Secure funding for all Activities as part of the Strategy at appropriate times during planning, implementation, and maintenance phases.	Funding secured.	In conjunction with applicable Activity.		
4.	<b>Partnerships &amp; Community Stewardship Initiatives</b> 4.1 Develop community stewardship initiatives in conjunction with engagement initiatives.	Community stewardship initiatives implemented.	Long-term.		
5.	<b>Engagement Initiatives</b> 5.1 Engage stakeholders and adjacent developers during the planning stages.	Engagement complete.	Short-term.		
6.	<b>Education, Training, and Research Initiatives</b> 6.1 Educate the public on ecological connectivity, provide training opportunities for such things as data collection, and allow for research opportunities.	Education, training, and research initiatives implemented.	Long-term.		
7.	<b>Monitoring, Maintenance, and Adaptive Management Initiatives</b> 7.1 Monitor, maintenance, and adaptive management initiatives to be incorporated into Human-Use plans and implemented per plan.	Ongoing monitoring, maintenance, and adaptive management.	In conjunction with planning.		
8.	<b>Adherence to Laws and Guidelines</b> 8.1 All Actions within the Strategy to adhere to the applicable guidelines standards, policies, and laws. Including, but not limited to, the City of Saskatoon, the Meewasin Valley Authority, the Province of Saskatchewan, and the Government of Canada.	All laws and guidelines adhered to.	In conjunction with all Actions.		
9.	<b>Climate Change Mitigation Initiatives</b> 9.1 Explore the impacts of climate change on Ecological Connectivity. Adapt mitigation measures where possible.	Climate change mitigation measures identified and implemented.	In conjunction with planning.		



**D**

**HYDROLOGY  
MEMO**



# RICHARD ST. BARBE BAKER AFFORESTATION AREA

HYDROLOGICAL/HYDRAULIC FRAMEWORK TO  
SUPPORT WETLAND SUSTAINABILITY

**Client: City of Saskatoon**  
**Prepared by: WSP Canada Inc.**  
**Date: 22 December 2023**



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# 1 OVERVIEW

Hydrology is arguably the most important consideration in understanding and preserving wetland function. Currently, little is known about the hydrology supporting the various waterbodies within the Richard St. Barbe Baker Afforestation Area (RSBBAA). To address this, a framework is proposed to (1) understand the hydroperiod of the wetlands present and (2) inform future decision making related to land use within the contributing catchment area. This framework is composed of two key phases:

- **Phase One:** The first phase will focus on evaluating the existing hydrology of the RSBBAA wetlands and how this has been influenced by historical land use changes.
- **Phase Two:** The second phase will focus on providing guidance to accommodate future land use changes within the catchment area while maintaining wetland function.

Recommendations for each phase of the framework are provided in the following sections.

## 1.1 PHASE ONE: EVALUATION OF EXISTING HYDROLOGY

An evaluation of existing hydrology supporting the RSBBAA wetlands is fundamental to assessing and supporting wetland function. This will provide insight into wetland hydroperiod<sup>1</sup>, answering key questions such as:

- *How does water level vary throughout a typical season?*
- *How high does it flood?*
- *What is the frequency and duration of flooding?*

Hydroperiod controls the ecological function and resultant plant community of a wetland. It also helps identify the hydrological inputs to sustain wetland health within a developing landscape.

It is suggested that an evaluation of site hydrology include the following key steps:

- 1. Delineate and characterize the contributing catchment area.** Based on available topographic data (e.g. LiDAR, manual/drone survey), delineate the land area that drains to the RSBBAA wetlands.
  - Where possible, utilize existing hydrological studies, drainage plans and/or infrastructure records to assess how/where drainage may not be accurately reflected by topographic data and refine the delineation to ensure it reflects the inclusion of any constructed works. At a minimum, this should include a review of potential contributions from the RSBBAA and surrounding lands (e.g., the CN Rail Yard, Cedar Villa Estates, Township Road 362A and Highway 7).
  - Characterize land use/land cover within the catchment area(s).
  - Confirm any data gaps/conflicts via manual inspection and/or survey.

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<sup>1</sup> A wetland's hydroperiod defines the rise and fall of its surface and subsurface water and the frequency and duration with which these processes occur.

- 2. Confirm the location, type, size, condition and elevation of any inlets and outlets in the RSBBA wetlands.** This may include overland drainage channels, areas of sheet flow, pipes/culverts or other structures. In particular, inlet/outlet data should be confirmed for:
  - The overland channel located at the north end of the large open water wetland complex.
  - The culvert connecting RSBBA to the Chappell Marsh facility operated by Ducks Unlimited Canada (DUC). There are anecdotal reports that the Chappell Marsh culvert may not be operating as intended. Ownership, condition, diameter, and invert elevations of the culvert should be confirmed and operations and maintenance of the structure should be explored via consultation with DUC.
- 3. Conduct investigations to address data gaps and characterize baseline conditions.** Data collection may include but is not limited to:
  - Water quality sampling in spring, summer and fall. This baseline data will inform the selection of water quality targets. Parameters for consideration include Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP), dissolved chloride, fecal coliforms (*E.coli*) and conductivity (EC).
  - Water level measurement. This will inform assessment of the hydroperiod. It may be carried out via manual measurement of water levels in spring, summer and fall (i.e., in conjunction with water sample collection) or a remote logger that provides a continuous record of water levels. There are a variety of economical level loggers (<\$1000 CAD) that are simple and reliable to use.
  - Vegetation field assessment. Vegetation communities are an excellent indicator of wetland hydrology and wetland health. Carrying out vegetation surveys (e.g. belt transects) will serve to define current wetland edge and delineate upland and wetland zones (e.g. open water, emergent, wet meadow, low prairie). These zones provide different habitat requirements for birds and wildlife. Vegetation surveys also provide valuable information on species diversity and the prevalence of weeds and/or invasive species. Developing a baseline vegetation data set is integral to wetland management because vegetation communities will shift in response to hydrological changes.
  - Wetland bathymetry (for hydrologic/hydraulic modeling).
  - Quantification of relative contribution of groundwater inputs (for reliable hydrologic/hydraulic modeling).
- 4. Characterize existing water quality within the RSBBA wetlands.** Characterize water quality in terms of the sampled parameters, comparing levels to relevant guidelines (e.g. CCME) and/or available data for natural wetlands. This will enable the City to identify and investigate any issues of concern (e.g. values outside of normal ranges). It will also inform the selection of targets for future development.
- 5. Assess past land use changes and select a target scenario that is representative of the “predevelopment conditions”.** Understanding and maintaining (or mimicking) pre-development hydrology is a critical component of successfully retaining wetland function. However, as nearly all landscapes have undergone some degree of alteration, selecting a target pre-development condition may not be straightforward. The following is recommended to facilitate definition of predevelopment condition:

- Conduct a review of historical aerial imagery to identify when landscape alterations have occurred and the extent to which natural wetlands were impacted.
- Use historical aerial imagery in combination with meteorological data to determine the hydroperiod of RSBBA wetlands. Identify whether/how the natural hydroperiod of the wetlands have been altered.
- Define the target “predevelopment condition” that will guide future development. This definition should take into account the viability of restoring/maintaining this condition. Preserving baseline conditions vs. restoring to a true pre-disturbance scenario (or some intermediate case) may result in very different management recommendations.

**6. Conduct hydrological and hydraulic modeling of the predevelopment condition.**

Once the predevelopment condition is clearly defined/selected, it is recommended that hydrologic and hydraulic modeling be conducted to quantify wetland inputs/outputs. If appropriate, this should include potential groundwater interactions.

**7. Select development targets for water quality as well as runoff rate, volume, and timing.**

Based on findings from prior steps, select clear targets to retain wetland function.

## 1.2 PHASE TWO: ACCOMODATION OF FUTURE DEVELOPMENT

Proactive planning that will establish guidance that can accommodate future development within the predevelopment catchment areas surrounding and within the RSBBA will be required to maintain wetland function. It is typically on the landowner/developer proponent to demonstrate that the proposed land use changes will not negatively impact retained natural features. However, the process to mitigate any proposed land use changes needs to be structured and universal for the RSBBA. Therefore, the following framework is recommended to guide development within the various pre-development catchments associated with the RSBBA wetlands:

**1. Identify/define modifications within the contributing catchment area (determined as part of Phase 1.1.1) that will trigger further evaluation.**

Changes that may impact wetland function include but are not limited to:

- Landscape changes (e.g., increases to site imperviousness).
- Roadway/culvert upgrades.
- Grading diversions.
- Overall changes to site drainage.

**2. Confirm that existing approval processes (e.g. development permit approvals,) are sufficient to identify key changes (per item 1) and trigger necessary analysis.**

**3. Develop submission guidance for post-development modeling and monitoring.**

Request that any proposed changes be accompanied by post-development modeling that demonstrates quantity and quality targets will be met post-development.

**4. Consider developing a stormwater master plan for the area.**

Should changes within the contributing catchment area be contemplated, an overarching plan could serve as a useful tool in achieving development targets. This may include, but is not limited to the following:

- Siting and sizing of stormwater management facilities, low impact development best management practices (LID BMPs) and/or other infrastructure to accommodate development and meet selected targets.
- Post-development hydrological and hydraulic modeling to demonstrate how targets will be achieved.
- Formulation of monitoring and adaptive management recommendations.



**E**

**ECOLOGICAL  
CONNECTIVITY  
MEMO**



# RICHARD ST. BARBE BAKER AFFORESTATION AREA

ECOLOGICAL CONNECTIVITY AND EVALUATION  
FRAMEWORK

**Client:** City of Saskatoon  
**Prepared by:** WSP Canada Inc.  
**Date:** 22 December 2023



WSP

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# 1 ECOLOGICAL CONNECTIVITY

Maintaining wildlife movement freely throughout the site by 2035 is a goal of the Natural Area Management Plan (NAMP). Thus, gaining an understanding of intra- and inter-ecological connections and subsequently maintaining or enhancing these connections will be critical to effectively managing wildlife movement, biodiversity, ecosystem services, and habitat use in the context of current and future land use changes that may occur.

Overall, wildlife passage through RSBBA is reasonably permeable due to the complex of forests and wetlands. Desktop investigation suggests a glacier scar that runs through the center of the site and extending northwest may be a potential wildlife movement corridor. However, there are barriers that have been identified at the site, primarily the CN Management Yard, and an informal trail system. Additionally, interspersed near the RSBBA are various private residences, agricultural land, and transportation features.

Baseline information and an understanding of wildlife movement across this glacial scar landscape and its connection to the South Saskatchewan River may become increasingly critical as future development and anthropogenic changes in adjacent landscape occur. Gaining an understanding of intra- and inter-ecological connections will be critical to effectively maintaining and enhancing wildlife movement, biodiversity, ecosystem services, and habitat use in the context of current and future land use changes that may occur.

According to the information available at the time of NAMP production, target species identified include migratory birds and large and medium-sized mammals. Amphibians have not been detected; however, as the wetlands and vegetation communities align with descriptions of amphibian habitat, they are predicted to occupy the site.

Using a remote camera survey and winter track survey, EDI (2022) did not identify any clear patterns of wildlife movement. In general, it was noted that large and medium-sized mammals predominately move in a north-south direction between the project study area and adjacent surroundings (EDI 2022). In addition, wildlife was observed to cross Township Road 362A and move between the Class V wetland and the Chappell Marsh Conservation Area. It is currently unknown if wildlife travels further south from the Chappell Marsh Conservation Area to the South Saskatchewan River. EDI (2022) did identify that Highway No. 7 is acting as a barrier to wildlife movement to the George Genereux Urban Regional Park.

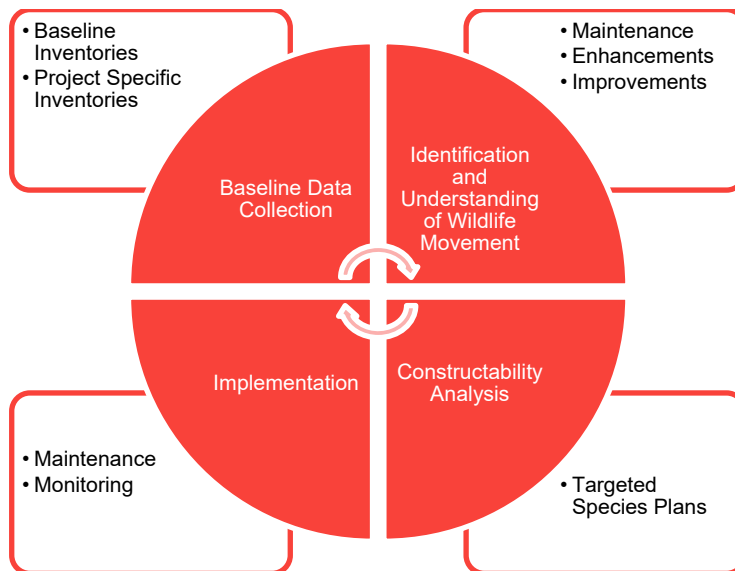
Generally, wildlife movement or connectivity management typically encompass the requirements of individual species or ‘target groups’ (groups of animals with similar needs). Therefore, the following general framework has been developed to initially understand and then plan for wildlife inter- and intra-connections.

## 1.1 WILDLIFE CONNECTIVITY UNDERSTANDING AND IMPLEMENTATION FRAMEWORK

Ecological connectivity should follow a series of general steps that include a targeted baseline investigation; identification of project-specific sources where locations within the site may need connectivity maintenance, repair or enhancement; A constructability analysis based on baseline information (e.g., appropriate species or target wildlife groups); implementation and of connectivity mitigation measures identified; and finally monitoring of the mitigations implemented (Figure 1-1).

The general framework detailed below for undertaking wildlife connectivity management has been adapted from the *Wildlife Passage Engineering Design Guidelines for the City of Edmonton* (Stantec 2010) and professional experience.





**Figure 1-1 Framework for the RSBBA Conceptual Plan**

### **1.1.1 STEP 1: BASELINE DATA COLLECTION**

Baseline data collection is a critical first step to understand general movement patterns and identifying specific species or wildlife groups that may be impacted by a current or future project initiative. This step is also invaluable when determining or confirming possible impacts from current or future barrier effects such as existing/future roads or land use changes. Overall, baseline data collection is comprised of several subsets including:

- Identifying species present in a defined study area,
- Identifying species movement patterns,
- Conducting a literature review of identified species regarding species’ habitat requirements and movement/migration behaviors,
- Classifying the type of barrier (e.g., transportation infrastructure and user speed, and temporal volume pattern).
- Evaluating changes in land use around the site from a movement restriction standpoint.

Tools used to identify species, as well as behavioral movement, include but are not limited to: wildlife remote cameras, snow- and mud-track surveys, interactive lighting assessments, and road-kills and/or wildlife-vehicle collisions datasets (if available).

### **1.1.2 STEP 2: IDENTIFICATION AND UNDERSTANDING OF WILDLIFE MOVEMENT**

After collection of baseline information has occurred, the data will require interpretation to extrapolate areas of high wildlife movement/use, the nature of use (e.g., dominant species or species group(s)), and determine target sites for connectivity maintenance or enhancements.

If the landscape allows efforts toward maintaining or enhancing intra-connectivity should be directed toward pre-existing movement corridors or areas of high wildlife use.

### **1.1.3 STEP 3: CONSTRUCTABILITY ANALYSIS**

Wildlife movement (e.g., crossing) structure recommendations are generally selected to target a single species, an animal grouping (e.g., large mammals, medium-sized mammals, amphibians, birds, etc.), or multiple animal/animal groups to maintain connections for unrestricted movement. The design should consider several aspects such as the nature of the species behavior (prey versus predator groups), size of the species, relative size of the design group, home range extents, habitat requirements (aquatic or terrestrial), sightlines and topography. If a target area that may be currently impacting (eg., CN Yards Management Area) or proposed in the future has been determined to support multiple species or animal groups, it is typically recommended to design passage mitigation for the largest species group (e.g., large terrestrial mammals if present) that has been confirmed and then incorporate design features that support the movement of smaller species groups (as required). Passage mitigation can be in multiple forms including, but not limited to, the following:

- Considerate placement of infrastructure to avoid or bypass identified high-use areas or known movement corridors.
- Posting signage to allow the use of trails or other amenities only during certain hours in a day/month/season (if required).
- Restoring degraded areas to decrease identified movement barriers.
- Reduced speed limits, limit the type of use via signage or physical alterations (e.g., speed bumps, curb extensions etc.).
- Public education.
- Altered lighting to mitigate avoidance behaviors.
- Passage structures (tunnels, culverts, overpasses/underpasses).
- Curb ramps.
- Noise barriers.
- Wildlife fencing.
- Targeted landscaping.

The most current and industry accepted passage/movement mitigation guides and frameworks should be consulted when designing passage/connective mitigation measures. Mitigation methods that have been monitored and demonstrated effective for maintaining or enhancing ecological connectivity should always be considered first. Available guidelines such as those found in Patriquin et al. (2020) and Stantec (2010) should be examined at the pre-planning phase when considering maintaining or enhancing wildlife movement for the site.

### **1.1.4 STEP 4: IMPLEMENTATION**

The installation of wildlife connectivity maintenance or enhancement measures has a wide range of costs and subsequent success. For example, the cost of installing education signage can be significantly less than the cost of developing passage specific infrastructure (e.g., culverts, overpasses, or underpasses). However, the positive impact on preserving connectivity or wildlife movement is typically less when attempting to manipulate human behaviour versus controlling wildlife movement.

As a result, a cost-benefit analysis to weigh the monetary expenditure of the chosen connectivity mitigation system against applicable variables such as the frequency of actual use (e.g., was a crossing hot spot/movement corridor identified, or were only opportunistic or anecdotal species noted) and the expected lifetime and effectiveness of the structure has incredible merit and should be considered for each project undertaken.

A thoughtful review of the various options available will also avoid improperly implemented crossing systems that may have the potential for greater or unexpected consequences than the potential benefits they may promote. For example:

Fences installed spanning over great distances may lead to a funneling effect if escape routes, such as one-way gates or jump-outs, are not also considered in the planning (City of Edmonton 2010).

The use of signage when the installation of appropriate passage infrastructure may limit the desirable outcome and only result in short term benefits and miss out on the opportunity for a greater long term positive outcome.

Once a proper cost-benefit optioning analysis has been prepared, the preferred option should be selected based on an appropriate vetting process (e.g., stakeholder engagement, City review etc.).

In addition to the consideration of sound connectivity mitigation selection, all wildlife movement mitigation strategies implemented should consider applicable provincial and federal approval application requirements, avoiding excess erosion in the interim and during operation; applying appropriate soil conservation strategies during construction; minimizing impacts of dewatering and always consider maintaining hydrological connections; limiting vegetation removal wherever possible; using native vegetation for any rehab or restoration requirements; avoiding construction during ecologically sensitive timeframes that may apply; incorporating site waste management during construction and operation (if required), and avoiding excess noise during construction and subsequent operation.

### 1.1.5 STEP 5: MONITORING

Similar to baseline data collection, monitoring programs are a key requirement to developing successful wildlife movement maintenance and enhancements. Project monitoring is discussed in greater detail in Section 8 of the NAMP and Section 6 of the Concept Plan. However, as it pertains to wildlife movement management, monitoring measures may include wildlife cameras, snow- and mud-tracking, and radio telemetry equipment.

## 1.2 CURRENT AND FUTURE CONSIDERATIONS

Examples of potential sources of current and future connectivity concerns within and adjacent to the site, their impact on the permeability of general wildlife movement, and suggested actions to manage movement restrictions are summarized in Table 1. However, managing ecological connectivity should be considered an adaptable process as new movement challenges arise with changes to infrastructure and adjacent land use(s), and as a greater understanding of the local connectivity landscape develops. As illustrated in Figure 1-1, the framework is cyclical and should be continually informed with updated information as movement/wildlife use data becomes available, if landuse change around the perimeter of the site, and as any infrastructure is established within.

Implemented measures have the potential to influence ecological connectivity both positively and negatively, as such they should be well thought out to determine long term influences prior to their initiation. This framework should be considered a starting point and provides a general process to follow when developing ecological connectivity management strategies and should be considered when undertaking any modifications to the site; changes with adjacent land uses; or determining/modifying local and regional transportation corridors in proximity to retained natural features.

**Table 1 Known Potential Sources Of Barriers To Wildlife Connectivity and Potential Impact On The Permeability Of The Landscape.**

SOURCES OF POTENTIAL BARRIERS	POTENTIAL IMPACT ON HABITAT PERMEABILITY	ACTION <sup>1</sup>
<p>Recreational use</p> <ul style="list-style-type: none"> <li>- Trails</li> <li>- Parking areas</li> <li>- Southwest Dog Park</li> <li>- Gathering spaces</li> </ul>	<ul style="list-style-type: none"> <li>-Introduction of undesirable species.</li> <li>-Existing illegal uses, such as dumping and hunting.</li> <li>-Future irresponsible recreational uses (i.e. off-trail use, vehicular use, etc.).</li> <li>-Frequent pedestrian traffic on the wetland margins can cause similar impacts as over-utilization.</li> <li>-Off-leash dogs outside of designated areas.</li> <li>Irresponsible recreational uses.</li> <li>-Competing recreational uses of the site.- Concentrated human use</li> </ul>	<ul style="list-style-type: none"> <li>Data Collection</li> <li>Planning &amp; Implementation</li> <li>Education, Training, and Research Initiatives</li> <li>Monitoring, Maintenance, and Adaptive Management Initiatives</li> </ul>
<p>Infrastructure</p> <ul style="list-style-type: none"> <li>- Fencing</li> <li>- Snow storage near civic grounds</li> </ul>	<ul style="list-style-type: none"> <li>-Existing Snow Storage near civic grounds</li> <li>-Impermeable barriers, such as fences and walls.</li> <li>-Alterations to the physical structure of wetlands and watercourses, riparian edges.</li> <li>-Reduced water quality</li> <li>-Negative alterations to the physical structure of water bodies and watercourses, riparian edges, water treatment, hydrological inputs, or conveyance of inputs.</li> </ul>	<ul style="list-style-type: none"> <li>Data Collection</li> <li>Planning &amp; Implementation</li> <li>Monitoring, Maintenance, and Adaptive Management Initiatives</li> <li>Adherence to Laws and Guidelines</li> </ul>
<p>Existing and future transportation routes</p> <ul style="list-style-type: none"> <li>- Saskatchewan Highway 7</li> <li>- CN Railway Yard and Rail line</li> <li>- Range Rd 3063</li> </ul>	<ul style="list-style-type: none"> <li>-High-risk barriers, such as transportation routes and development.</li> <li>-Long distances or broken connections between natural areas and habitats (on and off-site).</li> </ul>	<ul style="list-style-type: none"> <li>Data Collection</li> <li>Planning &amp; Implementation</li> <li>Financing</li> <li>Monitoring, Maintenance, and Adaptive Management Initiatives</li> <li>Adherence to Laws and Guidelines</li> </ul>
<p>Incompatible external land use</p> <ul style="list-style-type: none"> <li>- Cedar Villa Estates</li> <li>- Agricultural Lands</li> <li>- Saskatoon Civic Operations Center</li> </ul>	<ul style="list-style-type: none"> <li>-High-risk barriers, such as transportation routes and development.</li> <li>-Long distances or broken connections between natural areas and habitats (on and off-site).</li> </ul>	<ul style="list-style-type: none"> <li>Data Collection</li> <li>Planning &amp; Implementation</li> <li>Monitoring, Maintenance, and Adaptive Management Initiatives</li> <li>Financing</li> <li>Adherence to Laws and Guidelines</li> </ul>

<sup>1</sup> NAMP Report (2023) Appendix C: Action Summary – RSBBA

## 2 LITERATURE CITED

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Patriquin, D., Zeller, A. Truman, K., Hayes, R. and Gibbs, S. 2020. Managing and Enhancing Terrestrial Road Ecology. Ottawa, ON: Transportation Association of Canada

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**F**

**CITIZEN SCIENCE  
DATA**

# RICHARD ST. BARBE BAKER AFFORESTATION AREA

CITIZEN SCIENCE OBSERVATIONS

**Client:** City of Saskatoon  
**Prepared by:** WSP Canada Inc.  
**Date:** 22 December 2023



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# 1 CITIZEN SCIENCE DATA

Additional floral and faunal SOMC were observed on site through citizen science. Citizens, mainly members of Friends of the Afforestation Area (FOAA), who participated in data collection were engaged and mainly utilized iNaturalist and eBird to document species. These platforms were preferred for data collection as these apps are commonly used for citizen science activities in Saskatoon (e.g., bioblitzes), and citizens are, thus, familiar with the platforms' use and interface. Other sources are listed below. The species listed in Table 1 and 2 were observed by visitors or nature groups (e.g., FOAA) but were not verified.

These observations came from the following sources:

- ebird: A citizen science app and website developed by the Cornell Lab of Ornithology and National Audubon Society to record, share, and explore bird observations worldwide. Key features include observation recording, global databases, species identification, personal birding records, and maps and hotspots.
- iNaturalist: A citizen science app and website designed to record and share observations of plants, wildlife, fungi, and other organisms. For an observation on iNaturalist to reach a 'Research Grade' status, the following aspects need to apply:
  - o Observation contains a valid date, location, and photo/sound.
  - o Community needs to review and agree to the ID (minimum of two agreeing ID's required).

## 1.1 VEGETATION

The following vegetation species were observed. These are potential records that are unverified and are therefore not included in the NAMP report or the baseline summaries.

**Table 1 Flora SOMC observed by Citizen Science**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>A</sup>
American elm	<i>Ulmus americana</i>	S4
Blue wildrye	<i>Elymus glaucus ssp. glaucus</i>	S3
Bristle-leaved sedge	<i>Carex ebumeana</i>	S3
Bristly Cinquefoil	<i>Potentilla supina ssp. paradoxa</i>	S2
Bristly Gooseberry	<i>Ribes Oxyacanthoides var. setosum</i>	S2
Bushy Cinquefoil	<i>Potentilla supina ssp. paradoxa</i>	S2
California Amaranth	<i>Amaranthus californicus</i>	S2
Columbia Needlegrass	<i>Achnatherum nelsonii ssp. dorei</i>	S3
Englemann's spike-rush	<i>Eleocharis engelmannii</i>	S3
Green Ash	<i>Fraxinus pennsylvanica</i>	S4
Hairy Bugseed	<i>Corispermum villosum</i>	S2
Mucronate blue-eyed grass	<i>Sisyrinchium mucronatum</i>	S3
Narrow-leaved Water Plantain	<i>Alisma gramineum</i>	S3
Northern Small Yellow Lady's Slipper	<i>Cypripedium parviflorum var. makasin</i>	S3

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>A</sup>
Plains rough fescue	<i>Festuca hallii</i>	S3
Red elderberry	<i>Sambucus racemosa</i>	S2
Red-stemmed cinquefoil	<i>Potentilla rubricaulis</i>	S3
Rocky Mountain Sedge	<i>Carex saximontana</i>	S3

<sup>A</sup> Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023c). Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023c). S1 = Critically Imperilled/Extremely Rare; S2 = Imperilled/Very Rare; S3 = Vulnerable/Rare to Uncommon; S4 = Apparently Secure; S5 = Secure/Common; B = for a migratory species, applies to the breeding population in the province;

## 1.2 WILDLIFE

The following wildlife species were observed from iNaturalist, eBird, EDI (2022), and HabiSask. These are potential records that are unverified and are therefore not included in the main part of the NAMP report or the baseline summaries.

**Table 2- Faunal SOMC observed by Citizen Science**

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(A)</sup>	COSEWIC STATUS <sup>(B)</sup>	SARA STATUS <sup>(C)</sup>	COMMENTS
<b>Birds</b>					
American Kestrel	<i>Falco sparverius</i>	S5B, S1N	-	-	eBird
American White Pelican	<i>Pelecanus erythrorhynchos</i>	S3B	Not at Risk	-	iNat Research Grade
Baird's Sandpiper	<i>Calidris bairdii</i>	SUM	-	-	eBird
Canada Warbler	<i>Cardellina canadensis</i>	S4B, S3M	Special Concern	Threatened	iNat Research Grade
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4B	-	-	eBird
Harris Sparrow	<i>Zonotrichia querula</i>	SUB, S5M	Special Concern	Special Concern	eBird
Least Sandpiper	<i>Calidris Minutilla</i>	SUB	-	-	eBird
Osprey	<i>Pandion laiaetus</i>	S3B	-	-	eBird
Peregrine Falcon	<i>Falco peregrinus anatum</i>	S1B, SNRM	Non-active	-	EDI 2022
Pine Grosbeak	<i>Pinicola enucleator</i>	S2B, S4N	-	-	iNat Research Grade, eBird
Piping Plover	<i>Charadrius melodus spp. circumcinctus</i>	S3B	Endangered	Endangered	iNat Research Grade
Red-necked Phalarope	<i>Phalaropus lobatus</i>	S4B, S3M	Special Concern	Special Concern	eBird
Semipalmated Sandpiper	<i>Calidris pusilla</i>	SUB, S5M	-	-	eBird
Short-billed Dowitcher	<i>Limnodromus griseus</i>	SUB, S4M	-	-	eBird
Sprague's pipit	<i>Anthus spagueii</i>	S3B	Threatened	Threatened	eBird
Townsend Solitaire	<i>Myodestes townsendi</i>	S3N	-	-	EDI 2022, eBird, HabiSask
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	SUM	-	-	EDI 2022, eBird
<b>Invertebrates</b>					

COMMON NAME	SCIENTIFIC NAME	SKCDC RANK <sup>(A)</sup>	COSEWIC STATUS <sup>(B)</sup>	SARA STATUS <sup>(C)</sup>	COMMENTS
Celery looper moth	<i>Caradrina montana</i>	SU	-	-	EDI 2022, iNat Research Grade
Cow path tiger beetle	<i>Cicindela pupurea</i>	SU	-	-	EDI 2022, iNat Research Grade
Dart Moth	<i>Euxoa laetificans</i>	SU	-	-	EDI 2022
Four -spotted ghost moth	<i>Sthenopis purpurascens</i>	SU	-	-	iNat Research Grade
Goldenrod Gall Fly	<i>Eurosta solidaginis</i>	S3	-	-	iNat Research Grade
Great Ash Sphinx	<i>Sphinx chersis</i>	S3	-	-	iNat Research Grade
Jumping Plant Lice	<i>Cacopsylla magnicauda</i>	S4	-	-	EDI 2022
Prairie long-lipped tiger-beetle	<i>Cicindela nebraskana</i>	S3	-	-	iNat Research Grade
Ridged bark longhorn beetle	<i>Arbopalus asperatus</i>	SU	-	-	EDI 2022
Silver-spotted Skipper	<i>Epargyreus clarus</i>	S4	-	-	iNat Research Grade
Snowberry clearwing	<i>Hemaris diffinis</i>	SU	-	-	iNat Research Grade
Western Yellowjacket	<i>Vespula pensylvanica</i>	S2	-	-	iNat Research Grade
Woodland Skipper	<i>Ochlodes sylvanoides</i>	S2	-	-	iNat Research Grade

(a) Saskatchewan Conservation Data Centre Tracked Taxa Lists (SKCDC, 2023c).

S1 = Critically Imperilled/Extremely Rare; S2 = Imperilled/Very Rare; S3 = Vulnerable/Rare to Uncommon; S4 = Apparently Secure; S5 = Secure/Common; B = for a migratory species, applies to the breeding population in the province; M = for a migratory species, rank applies to the transient (migrant) population; N = for a migratory species, applies to the non-breeding population in the province; U = status is uncertain in Saskatchewan.

COSEWIC = Committee on the Status of Endangered Wildlife in Canada (Government of Canada, 2022); SARA = Species at Risk Act (Government of Canada, 2022); - = not assessed.