A background image of a dense forest with tall trees and green foliage, overlaid with a semi-transparent green filter. A dirt path is visible in the lower center.

DAWSON PARK AND KINNAIRD RAVINE MASTER PLAN

**Environmental Sensitivities Report
February 2017**

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Introduction

Dawson Park and Kinnaird Ravine are important links for people and wildlife in Edmonton's green space network, with recreational use expected to grow over the coming years.

Project Background

Dawson Park and Kinnaird Ravine are established River Valley parks within the North Saskatchewan River Valley, adjacent to Edmonton's downtown core. They offer visitors the chance to run, hike, walk their dogs and cycle through the ravine landscape, which is an escape from the city for many urban dwellers. There are also opportunities to meet with friends, family and neighbours in the park and to access the river for boating, fishing and relaxation. As part of the 10-Year Capital Investment Agenda, The River Valley Park Renewal program has identified the Dawson Park and Kinnaird Ravine Master Plan as a way to provide direction on the investment for the park.

There has been no comprehensive planning process for the project area since the 1970s when the Capital City Recreation Park Concept (CCRPC) Plan was implemented. As part of the CCRPC Plan, Dawson Park was identified as a rest area that offered a 45-stall parking lot, hiking and biking trails, rest areas with rest rooms, benches, telephones and preserved natural areas. In addition to planned infrastructure, Dawson Park includes an off-leash area between Dawson Bridge and Capilano Bridge, granular trails for visually impaired persons and picnic areas. The project area occupies approximately 76 hectares.

Access to Dawson Park is currently provided via 89th Street near Dawson Bridge and through a nearby transit stop at Rowland Road and 89th Street. Pedestrian access off Jasper Avenue is provided via a wooden staircase at 92nd Street, a

granular/multipurpose trail, a footpath extends from the Latta Bridge and 91st Street. Jasper Avenue east currently provides limited connectivity to Dawson Park for the growing number of residents of Boyle Street and Cromdale neighbourhoods. Dawson Park was designed to create access to the river; it is actively used for water craft launching by several boating groups, including RiverWatch and Edmonton Dragon Boat Racing Club, as well as the public.

The Dawson Park and Kinnaird Ravine Master Plan will build upon existing plans, policies and initiatives while identifying public needs and priorities for the park. It will provide direction for environmental management as well as recommendations for civic, cultural and recreational uses that are appropriate to the area. The new Master Plan will establish a vision and management plan for Dawson Park and Kinnaird Ravine for the next 25 years and will be developed throughout 2016 and 2017.

The Master Plan is currently in the Concept Phase of the City of Edmonton's Park and Facility Development Process. Existing policy, City Administration and public input will inform the process and outcomes of the Concept Phase, at the end of which the Master Plan report and concept design will be submitted to City Council as part of the 2019-2022 budget cycle to seek funding for its implementation.

Purpose of the Report

To date, O2 Planning + Design Inc. has presented their initial understanding of existing conditions in the park area to City of Edmonton staff, key stakeholders and the public for feedback. No design options have been proposed at this stage. The purpose of this report is to determine ecological sensitivities that may exist within the project area at the preliminary stages of park concept development.

Environmental considerations are reported per the requirements of the North Saskatchewan River Valley Area Redevelopment Plan (ARP) Bylaw 7188 Schedule D, which is intended to ensure that the objectives and policies of the ARP are achieved. The City requires that a summary of environmental costs and benefits (or opportunities and constraints) be presented for any project site outside the Central area defined by the ARP.

The information presented in this report will be used to help the project team (including O2 Planning + Design Inc., sub-consultants and the City of Edmonton) understand the opportunities and constraints within the project site. Findings will be analyzed in conjunction with public feedback and City priorities to determine potential concept design options.

This report includes:

- » A summary of the key findings from the Environmental Overview, desktop analysis and field assessments
- » Site mapping of the following environmental factors:
 - » Surrounding land use
 - » Site geology/geomorphology
 - » Site hydrology
 - » Site soils
 - » Site vegetation and wildlife habitat
 - » Visual assets and sensory experience
 - » Historical/archaeological considerations
- » Environmental sensitivity analysis (guided by the 1992 Ribbon of Green Master Plan Resource Classification System)
- » An overall description of the sensitivity levels in the project area and their implications for the Master Plan
- » A description of the resulting landscape units within the site and their key attributes that contribute to opportunities and constraints for the project area

Methodology

Basin Environmental Ltd., an environmental consulting firm based out of Edmonton, Alberta, prepared an Environmental Overview of Dawson Park and Kinnaird Ravine. The Environmental Overview outlines the presence of environmental sensitivities and potential general impacts associated with future development in Dawson Park and Kinnaird Ravine.

In addition to the above-mentioned reporting, O2 Planning + Design Inc. synthesized the following material and information to complete the environmental analysis presented in this report:

- » Data:
 - » Sewer and pipe lines (MPE Engineering Ltd.)
 - » Floodplain delineation (Matrix)
 - » Geotechnical drawings (Thurber Engineering)
 - » Ground cover, vegetation and land use (Solstice)
 - » LIDAR elevation and surface data
 - » City of Edmonton geographic information, including City infrastructure, utilities, vegetation and park assets
 - » Multiple site visits and observations
 - » Desktop analysis of vegetation, topography and hydrology
- » Reports:
 - » Overview of Potential Historic Resources for Dawson and Oleskiw Parks by Heritage Collaborative Inc.
 - » Hydrotechnical Engineering Overview by Matrix Solutions, Inc.
 - » Geotechnical Report by Thurber Engineering Ltd.

The information in this report is presented to the level of detail and accuracy that is possible at the present stage of the project, informed by the completion of the Environmental Overview. Additional analysis, such as a complete land cover health assessment and a wildlife corridor study, will be more feasible after the completion of a full Environmental Impact Assessment. It is recommended that the City of Edmonton integrate the findings of the Environmental Sensitivity Mapping project into the environmental analysis of their current and future park and open space planning initiatives, where appropriate.

Wildlife in the River Valley

Although Dawson Park and Kinnaird Ravine are park areas adjacent to the downtown core of Edmonton, they are valuable habitats and corridors for wildlife within the River Valley. One of the goals of this report is to summarize the environmental conditions of the project area to inform future use in Dawson Park and Kinnaird Ravine. (Photo below: Coyote observed during a field visit to Dawson Park. Dawson Bridge is visible in the background.)



Regulatory Setting

The Master Plan for Dawson Park and Kinnaird Ravine will operate under the framework of existing environmental policy. The implementation and maintenance of the Master Plan will be in accordance with the following policies.

Federal

Canadian Environmental Assessment Act

The Canadian Environmental Assessment Act, 2012 (CEAA 2012) project review process pursuant to the requirements of CEAA is triggered when a federal authority proposes a project, grants money to a project, grants an interest in land to a project, and/or exercises a regulatory duty in relation to the project. CEAA only applies to projects described in the Regulations Designating Physical Activities or those designated by the Minister of the Environment.

Fisheries Act

The Fisheries Act is administered by the Department of Fisheries and Oceans Canada (DFO) and has provisions aimed at the protection of fish and fish habitat from serious harm. The Fisheries Act applies to all projects that have a potential to cause serious harm to fish and fish habitat that are part of or support a commercial, recreational or aboriginal fishery.

Navigation Protection Act

The Navigation Protection Act (NPA), administered by Transport Canada, provides the protection of navigation on all public navigable waterways in Canada through the Navigation Protection Program. Regulatory approval is required in scheduled navigable waters where the works risk a substantial interference with navigability. Scheduled navigable waters are included in the List of Scheduled Waters under the NPA. For works in non-scheduled waterways, owners of the works may opt-in for a review under the NPA. Non-scheduled waterways are still protected under the Act and could be subject to court proceedings if the works interfere with navigation.

Migratory Birds Convention Act

The Migratory Birds Convention Act (MBCA) is administered by Environment Canada and provides protection and preservation for migratory birds and migratory bird habitat through the Migratory Birds Regulations and Migratory Birds Sanctuary Regulations. The MBCA and its regulations apply to migratory game birds (e.g., ducks, geese and swan), migratory

insectivorous birds (e.g., chickadees and cuckoos) and migratory non-game birds (e.g., gulls and herons). See Article I of the MBCA for the list of the families of migratory birds protected under the MBCA.

Species at Risk Act

The Species at Risk Act (SARA) is federal legislation intended to protect sensitive species. Species included under Schedule 1 are established by the Federal Cabinet and are based on recommendations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and consultation with government, Aboriginal peoples, stakeholders and the Canadian public. SARA applies to federal lands; however, it may also apply to other lands when provincial protection is deemed inadequate by the Federal Minister of the Environment. SARA applies to all lands in Canada for Schedule 1 bird species protected by the Migratory Birds Convention Act.

SARA also has a provision to protect 'critical habitat' "...that is necessary for the survival or recovery of a listed wildlife species and is identified as the species' critical habitat in the recovery strategy or in an action plan for the species" (Section 2(1) of SARA). If an activity is expected to affect a wildlife species listed under Schedule 1 of SARA or destroy any part of its 'critical habitat', additional regulatory requirements, including notification of appropriate regulatory agencies and application for a permit under Section 73 of SARA, will need to be fulfilled.

Provincial

Environmental Protection and Enhancement Act

The purpose of the Environmental Protection and Enhancement Act (EPEA) is to ensure sustainable use of the environment through protection, enhancement and wise use of natural resources. EPEA ensures environmental protection is considered in the early stages of planning. This process helps predict potential environmental consequences of an activity and minimize any adverse impacts before they occur. Alberta Environment and Parks regulates a wide range of activities under the EPEA through conditions set out in regulations, approvals and Codes of Practice.

Public Lands Act

The Public Lands Act regulates various public land uses (e.g., land dispositions), the sale and purchase of land, and the declaration of water bodies as being owned by the Crown. The Crown may claim the bed and shore of permanent water bodies (e.g., wetlands, creeks and drainage channels) found on a given property.

Water Act

Pursuant to Section 36 of the Water Act, activities that may impact water bodies and the aquatic environment, regardless of ownership, require an approval unless otherwise authorized by the Water Act. In the Water Act, 'activity' is broadly defined to include the following actions: placing construction works within a water body; erosion protection; draining a water body; removing or disturbing ground and/or vegetation within the bed and shore that results in altering the flow, level, direction and/or location of a water; and channel realignment.

Wildlife Act

The Wildlife Act and Wildlife Regulation provide the legislation and regulatory provisions to protect and manage wildlife on all land in Alberta. The Minister responsible for Fish and Wildlife Management has the authority under the Wildlife Act to influence and control activities that may have direct adverse

effects on the populations and habitat of wildlife species (Section 103 of the Wildlife Act). If the proposed development is anticipated to disturb or destroy habitat of prescribed wildlife species listed under the Act, additional regulatory requirements may need to be met depending on jurisdiction and land ownership (Section 36(1) of the Wildlife Act).

The following birds are not protected under the MBCA, but are protected provincially under Alberta's Wildlife Act: grouse, quail, pheasants, ptarmigan, hawks, owls, eagles, falcons, cormorants, pelicans, crows, jays and kingfishers.

Weed Control Act

The Weed Control Act regulates the control of noxious weeds, and the destruction of prohibited noxious weeds in Alberta. The Weed Control Act Regulation provides a complete listing of all designated Noxious and Prohibited Noxious weed species in the province.

The application of pesticides is controlled through the Environmental Protection and Enhancement Act and should be reviewed in the event that pesticide application is required.

Historical Resources Act

The Historical Resources Act requires clearance for any development that may impact historical resources in Alberta. Clearance is issued by the Heritage Resources Management Branch of Alberta Culture and Tourism (Alberta Culture and Tourism 2015). Historical resources include structures, archaeological sites, paleontological resources, and other works of humans or nature that are of value.

**Dawson Park and Kinnaird Ravine within the
River Valley Policy Framework**

Dawson Park and Kinnaird Ravine are in the Central North Saskatchewan River Valley, within the Regional Biological corridor of the North Saskatchewan River Valley and Ravine system (Hobson et al, 2008). This planning area contains several developed and actively used areas of the River Valley that fall under the jurisdiction of federal, provincial and municipal policies.



Municipal

North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188)

The purpose of the North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188) is to ensure the preservation of the natural environment in the River Valley and tributary ravine system. The plan requires environmental reviews of development projects that occur within the Bylaw's boundaries. The Environmental Impact Assessment is intended to fulfill the Bylaw requirements for this Project.

Community Standards Bylaw 14600

The Community Standards Bylaw 14600 establishes construction working periods (Monday to Saturday: 07:00 to 22:00; Sunday and Holidays: 09:00 to 19:00) and acceptable noise levels (maximum 65 dBA). It is a requirement that this Bylaw be adhered to during construction. Standard protocols for exceptions may be granted with special permission by the City of Edmonton.

Corporate Tree Management Policy

All naturally treed areas and ornamental trees on city-owned land are the responsibility of Edmonton's Park Branch (including procurement, maintenance, protection and preservation) and are encompassed in Edmonton's Corporate Tree Management Policy C456A. The policy states that where loss or damage to a City tree(s) occurs, compensation for the loss will be recovered from the individual causing the damage or loss and applied to future tree replacements. The Corporate Tree Management Policy includes the replacement of some non-native or invasive tree species and must be taken into account in projects focusing on invasive species removal.

City of Edmonton Wildlife Passage Guidelines

The City of Edmonton's Wildlife Passage Engineering Design Guidelines were introduced in 2010 (Stantec Consulting Ltd. 2010). The guidelines provide recommendations to incorporate the needs of wildlife into transportation projects by restoring previously removed wildlife connectivity corridors and passages. The guidelines also assist in minimizing human-wildlife interactions such as vehicle collisions and reducing habitat fragmentation.

City of Edmonton Natural Area Systems Policy

Natural Area Systems Policy C531 by the City of Edmonton underlines the city's commitment to protect natural area systems through effective urban planning and development, encouragement of public engagement in natural area issues, promotion of environmental stewardship and establishment of conservation practices using the best available science.

Environmental Context

Dawson Park and Kinnaird Ravine are located near the urban core of the City of Edmonton, providing city dwellers with the opportunity to connect to the larger River Valley ecosystem that extends throughout the city and beyond into the larger region.

Dawson Park and Kinnaird Ravine are located in the City of Edmonton, within the Eastern Alberta Plains and the Central Parkland Natural Subregion of the Parkland Natural Region (Natural Regions Committee [NRC] 2006). The Central Parkland Subregion includes the heavily populated, intensely cultivated, and fertile area of central Alberta. The landscape is characterized by undulating till plains and hummocky uplands, eolian deposits, aspen forests and prairie vegetation (NRC 2006). Precipitation in the subregion is usually significant from June to August with a peak in July (NRC 2006). Warm, long summers, suitable soils and significant annual precipitation create adequate conditions for the growing season. Prevalent soil types include Black Chernozems, Orthic Dark Grey Chernozems and Solonchic soils (NRC 2006).

The North Saskatchewan River Valley and Ravine system is considered a national environmentally sensitive area as it provides critical habitat, corridors and linkages for a diverse range of wildlife species. Dawson Park and Kinnaird Ravine is in the Central North Saskatchewan River Valley, within the Regional Biological corridor of the North Saskatchewan River Valley and ravine system (Hobson et al, 2008). This planning area contains several developed and actively used areas of the River Valley. While several Semi-Natural Linkages exist, further maintenance and restoration of ecological connectivity are recommended (Hobson et al, 2008).

Zoning and Surrounding Land Use

Dawson Park and Kinnaird Ravine are located in Zone A: Metropolitan Recreation Zone in the City of Edmonton. Golf courses and smaller River Valley parks are adjacent to the project area, but ecological connections, especially on the southern end of the Dawson Park, are narrow and minimal.

Much of the surrounding land use is residential. Housing to the north-east of the park tends to include multi-story, dense residential dwellings, while to the south there are mainly single family homes. Industrial land and transportation infrastructure (including the LRT line) run north to south on the west end of the park. Kinnaird Ravine offers an important connection to the Stadium Station LRT stop.

Commercial and institutional land uses also surround the project area. Because Dawson Park and Kinnaird Ravine are in the downtown core of Edmonton, development is denser and activity levels are higher in the surrounding area than in other parts of the city. Pollution, storm water runoff, noise and garbage all disturb natural functions as well as visitor experience within the park. Kinnaird Ravine is the least disturbed natural area in the project area as well as the surrounding neighbourhoods. Dawson Park is more conducive to potential amenity or activity expansion, should that be a desired outcome of the Master Plan.

**Dawson Park & Kinnaird Ravine
Land Use Map**



LEGEND

- residential
- recreation and open space
- vegetated right of way
- institutional
- commercial
- industrial
- transportation
- telecommunication and utilities
- vacant and undeveloped



0

800 M

Overview of Environmental Factors

The following environmental factors are presented to provide an objective overview of the existing features within the project boundaries. Characteristics described in this section contribute to the environmental sensitivity of the park area.

Site Geology & Geomorphology

Methodology:

Relevant existing geological data within the designated study area was collected and reviewed. Aerial photograph interpretation (API) using available air photos and review of LiDAR data of the study area were used to determine the top of bank line. A limited site reconnaissance was also carried out to confirm the findings of the desktop study. Previous mining activity was identified using the coal mine atlas by R.S. Taylor.

Summary of Features:

The valley slopes within Dawson Park are generally sloped at 15 to 35 degrees, are approximately 35 to 40 m in height and are generally treed. Tilting trees were observed at several locations within the valley slopes. The elevation of the upland plateau is an average of 662 m and the lower terrace ranges from about 625 m to 630 m, dipping slightly towards the North Saskatchewan River. **In general, it is not recommended to develop on slopes over 15%. However, further geotechnical analysis would be required to confirm the feasibility and risk. Slope stabilization may be required on steeper slopes.**

The bedrock underlying the surficial deposits at Dawson Park and Kinnaird Ravine consists of the Upper Cretaceous, Horseshoe Canyon Formation. The Horseshoe Canyon Formation consists of deltaic and fluvial deposits of interbedded and interlensed fresh and brackish water sandstone, siltstone and shale. Typical sediments consist of soft grey, greenish and white weathered bentonitic feldspathic sandstone, brown bentonitic shales, coal seams and beds of carbonaceous shale. The Horseshoe Canyon Formation sandstone is exposed on the north slopes of the North Saskatchewan River valley in Dawson Park.

Based on geotechnical recommendations, higher intensity development is less appropriate in areas where ground water levels could interfere with the construction and maintenance of

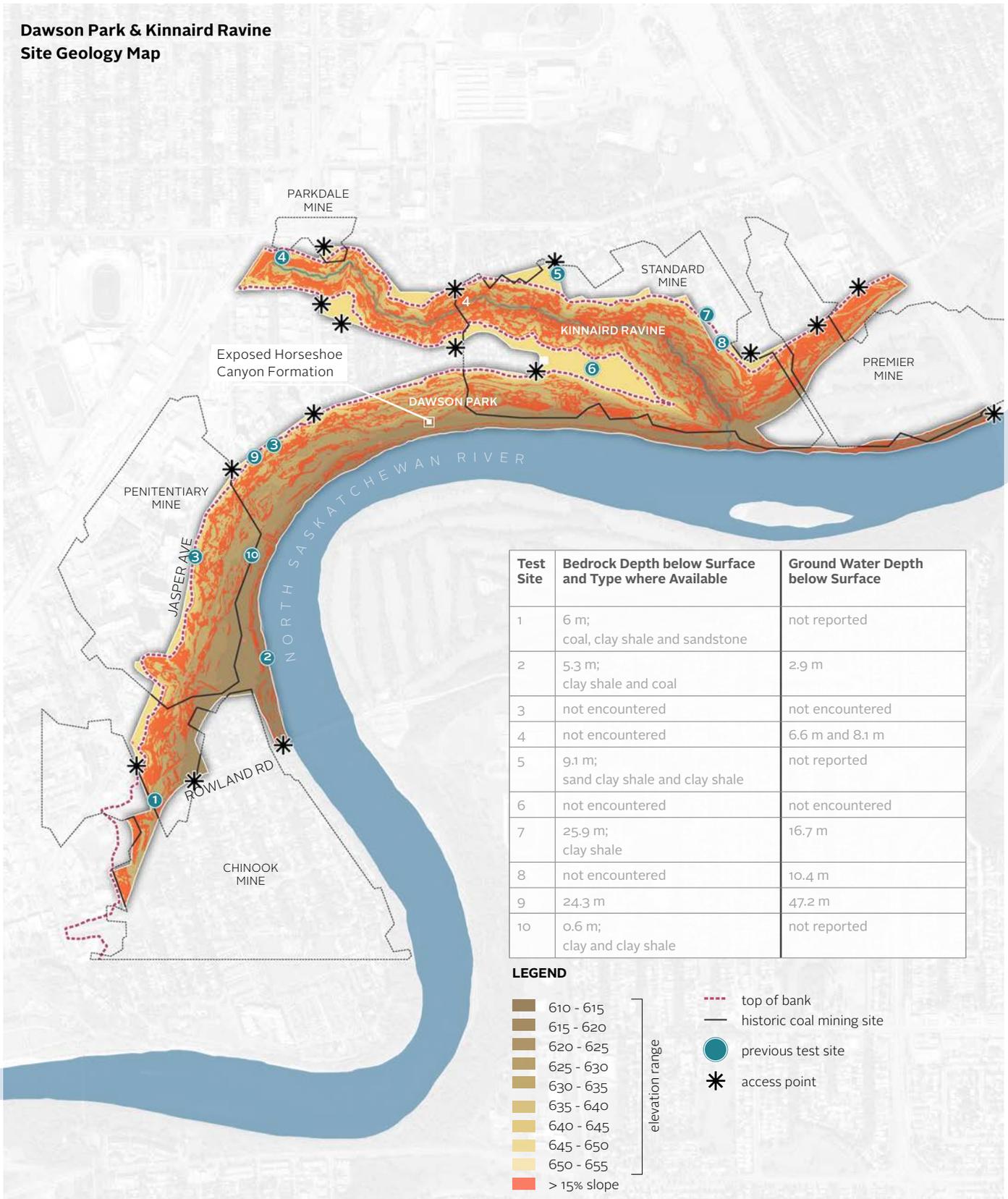
potential facilities. Areas with a shallower ground water table require more effort during excavation and have a greater risk of ground water contamination from human activity.

Ten geotechnical references were available within the study area (outlined in the chart on the following page). In general, soil conditions noted in these bore holes consist of alluvial sand, silt and clay overlying bedrock within the floodplain area below the valley slopes and clay overlying clay till over bedrock within the plateau areas above the valley slopes.

Historical coal mining within Dawson Park and Kinnaird Ravine used underground room and pillar mining techniques. Ground subsidence resulting from former abandoned underground mines generally occurs within a period of several years following abandonment. On this basis, **the presence of former coal mine workings are not expected to have significant impact on future park surface developments. However, further evaluation would be required in the event that future buildings or structures are proposed within the park.**

- » The Standard Mine operated from 1905 to 1923 from two coal seams: the Clover Bar seam was located between about 12 m and 56 m below ground and the Lower Clover Bar seam was located between about 21 m and 33 m below ground.
- » The Premier Mine operated from 1920 to 1937 from one coal seam, which was located between about 12 m and 56 m below ground.
- » The Chinook Mine operated from 1907 to 1911 and from 1918 to 1930 from one coal seam, located between about 18 m and 70 m below ground surface.
- » The Penitentiary Mine consisted of two coal seams. The upper coal seam, the Pen Mine, operated from 1908 to 1920 and the lower coal seam, the Penn Mine, operated from 1920 to 1930. The upper coal seam was up to about 27 m below ground and the lower coal seam was located between about 18 m to 76 m below ground.

**Dawson Park & Kinnaird Ravine
Site Geology Map**



Test Site	Bedrock Depth below Surface and Type where Available	Ground Water Depth below Surface
1	6 m; coal, clay shale and sandstone	not reported
2	5.3 m; clay shale and coal	2.9 m
3	not encountered	not encountered
4	not encountered	6.6 m and 8.1 m
5	9.1 m; sand clay shale and clay shale	not reported
6	not encountered	not encountered
7	25.9 m; clay shale	16.7 m
8	not encountered	10.4 m
9	24.3 m	47.2 m
10	0.6 m; clay and clay shale	not reported

LEGEND

- 610 - 615
 - 615 - 620
 - 620 - 625
 - 625 - 630
 - 630 - 635
 - 635 - 640
 - 640 - 645
 - 645 - 650
 - 650 - 655
 - > 15% slope
- } elevation range
- top of bank
 - historic coal mining site
 - previous test site
 - * access point



Site Hydrology

Methodology:

Aerial photograph interpretation (API) using available air photos and a review of LiDAR data of the study area was carried out to determine extent of river erosion. The study also included a review of the Alberta Fisheries & Wildlife Management Information System (FWMIS) and a site visit.

Summary of Features:

Bank erosion is evident throughout the reach of the North Saskatchewan River that flows beside Dawson Park, with steep banks approximately 2-3 m in height. The banks are well vegetated, which aids in bank stabilization. The over bank rises gently from the top of bank and continues to the top of the River Valley at a steep slope.

Dawson Park is mostly situated above the 1:100 year flood level, with the exception of two small areas located immediately downstream of Dawson Bridge and upstream of the Highlands Golf Club. A comparison of historical bank lines for the North Saskatchewan River spanning a period of 1969 to 2008 indicates minor lateral bank movement along the north bank in the area immediately downstream of Dawson Bridge. However, this movement is not considered significant.

Rat Creek:

Rat Creek is classified as an unmapped Class C water body with a Restricted Activity Period (RAP) of September 16 to July 31, since it drains into the section of the North Saskatchewan River with the RAP of September 16 to July 31, as per the Code of Practice for the St. Paul Management Area (ASRD 2012). **The sections of the North Saskatchewan River to the south and the east of Dawson Park are classified as Mapped Class A water bodies with important sturgeon habitat.**

Rat Creek was significantly impacted by industrial, urban and agricultural development starting in 1920s. Prior to the impacts, Rat Creek was a larger watercourse with marshy areas and higher water levels that allowed for recreational use by locals (Alberta Avenue, Eastwood and Parkdale-Cromdale Community Leagues 2016). The creek used to be fed primarily by marshes upstream that were in the present Kingsway Mall area. Overtime, the marshy areas were drained for agricultural purposes and some of the sections of the creek were partially filled to accommodate urban development. Construction of 111th Avenue and urban development to the east of Dawson Park have reduced the original Rat Creek to a shorter and less pronounced watercourse, which presently extends from 82nd Street towards the North Saskatchewan River through Kinnaird Ravine.

FWMIS results show a previously confirmed presence of one non-sport fish species, brook stickleback, in Rat Creek. In the North Saskatchewan River within the City of Edmonton, 11 sport fish species and 19 non-sport fish species have been documented (AEP 2015).

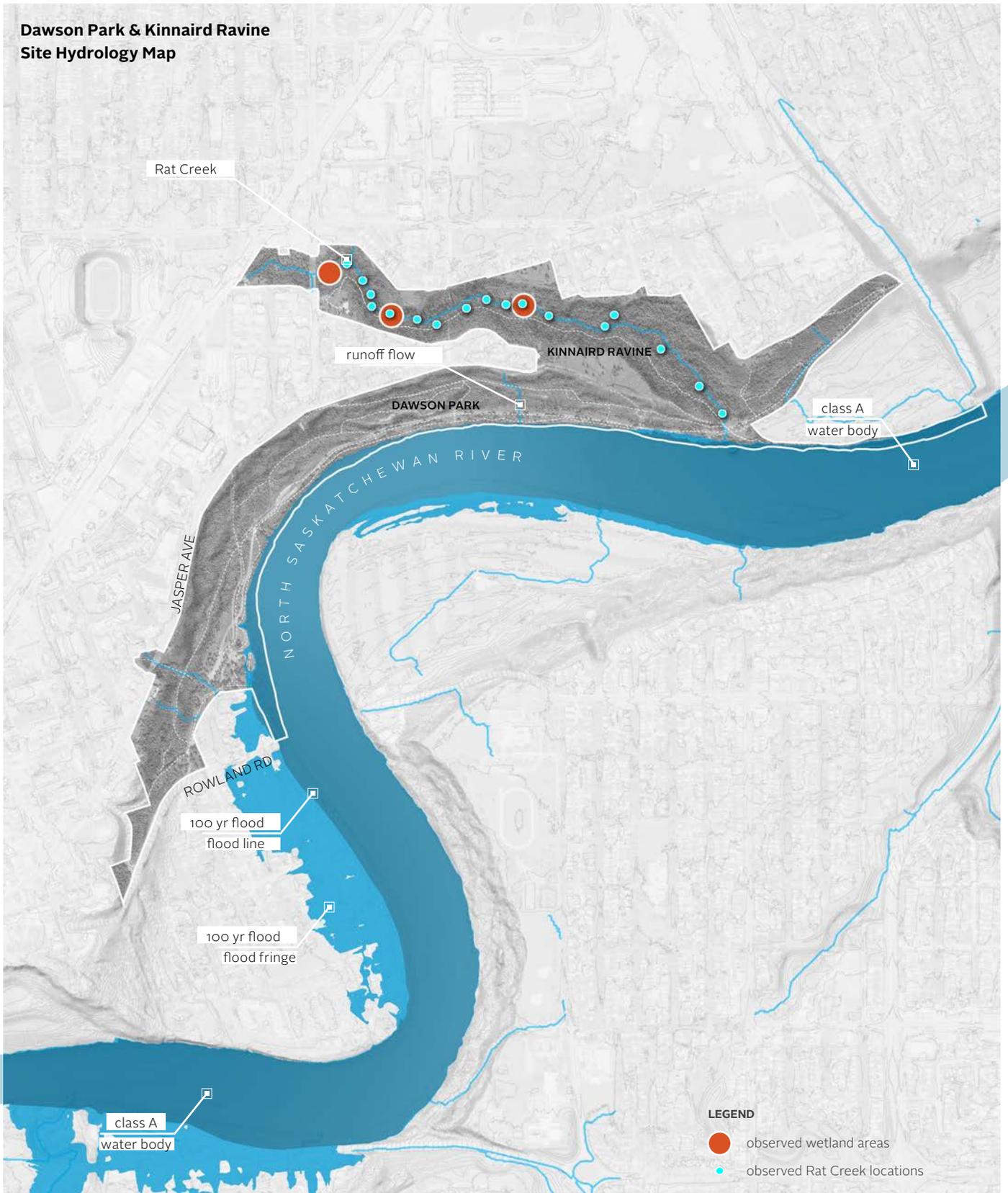
A preliminary watercourse assessment of Rat Creek, including an assessment of fish habitat potential, was conducted on July 12, 2016. Upstream, near 82nd Street, Rat Creek exhibits ephemeral properties. For the rest of its course it is an intermittent watercourse with a width less than 0.7 m. Near its confluence with the North Saskatchewan River it drains into the culvert that supports a park trail. Three wetland-like areas were observed upstream of the creek's confluence with the river. The culvert crossing location on Rat Creek was revisited on August 6, 2016. Compared to the earlier site visit on July 12, 2016, less water was present in the creek. **Given the low flow and intermittency, Rat Creek is unlikely to provide good habitat for fish.**

Recommendations:

Although Rat Creek is unlikely to provide good quality fish habitat, a follow-up QAES assessment is recommended to supplement the planned EIA and assessment of the effects of potential construction activities. Restoration at the mouth of Rat Creek could improve the likelihood of fish habitat in Dawson Park and Kinnaird Ravine. Development near the existing wetlands would be subject to the Water Act and would require the wetlands to be delineated.

It is important to avoid conditions that trap or block surface water on slopes. Concentrated runoff can result in the development of deep erosion gullies on valley slopes, which over time can undermine and destabilize the slopes. When designing a development, the slopes should be contoured such that the majority of precipitation drains away from the slope.

**Dawson Park & Kinnaird Ravine
Site Hydrology Map**



Site Soils

Methodology:

Aerial photograph interpretation (API) using available air photos and review of LiDAR data of the study area was carried out to determine active and inactive slope movements. LiDAR data and air photos were reviewed to determine historic landslide retrogression into the crests of the North Saskatchewan River Valley and ravine slope.

The desktop soil assessment consisted of reviewing previous geotechnical and environmental assessment reports, the Abacus Datagraphics online database (AbaData), the Alberta Soil Information Viewer and the Alberta Geological Survey. The desktop soil assessment did not include a site visit, vegetation or topography assessment, and as a result, the soil assessment should only be used as a general guidance.

Summary of Features:

The bedrock is covered by surficial deposits composed of late Tertiary and Quaternary Period deposits. Tertiary deposits around Edmonton are part of the Empress Formation (also referred locally as the Saskatchewan sands and gravels) that were deposited in the pre-glacial river valleys that occupied the Edmonton area. These valleys are now referred to as buried valleys because they were infilled with glacial and lacustrine deposits during post glacial times.

The Empress Formation sands and gravels are composed primarily of quartzite with minor chert, ironstone and coal fragments. The origin of the sand and gravel material is from the Canadian Rockies to the west of Edmonton.

Quaternary deposits are mostly glacial deposits covered by recent postglacial deposits. Most of the glacial deposits on the site consist of till covered by glaciolacustrine silt and clay deposited in the glacial Edmonton lake.

Postglacial deposits consist of alluvium and colluvium deposits. Alluvium is located at the bottom of the North Saskatchewan River Valley, and was formed during the creation of the valley. Alluvium is composed of bedded gravel, sand and clay (becoming coarser with depth) and is generally a few metres thick. It can be up to 10 m thick under the low level terraces. In places where the existing North Saskatchewan River is incised into buried valley deposits, alluvium may be overlying glacial deposits or even preglacial deposits. Otherwise the alluvium overlies the bedrock. Colluvium is bedrock that has been moved by gravity or surficial deposits, covering much of the River Valley and creek slopes.

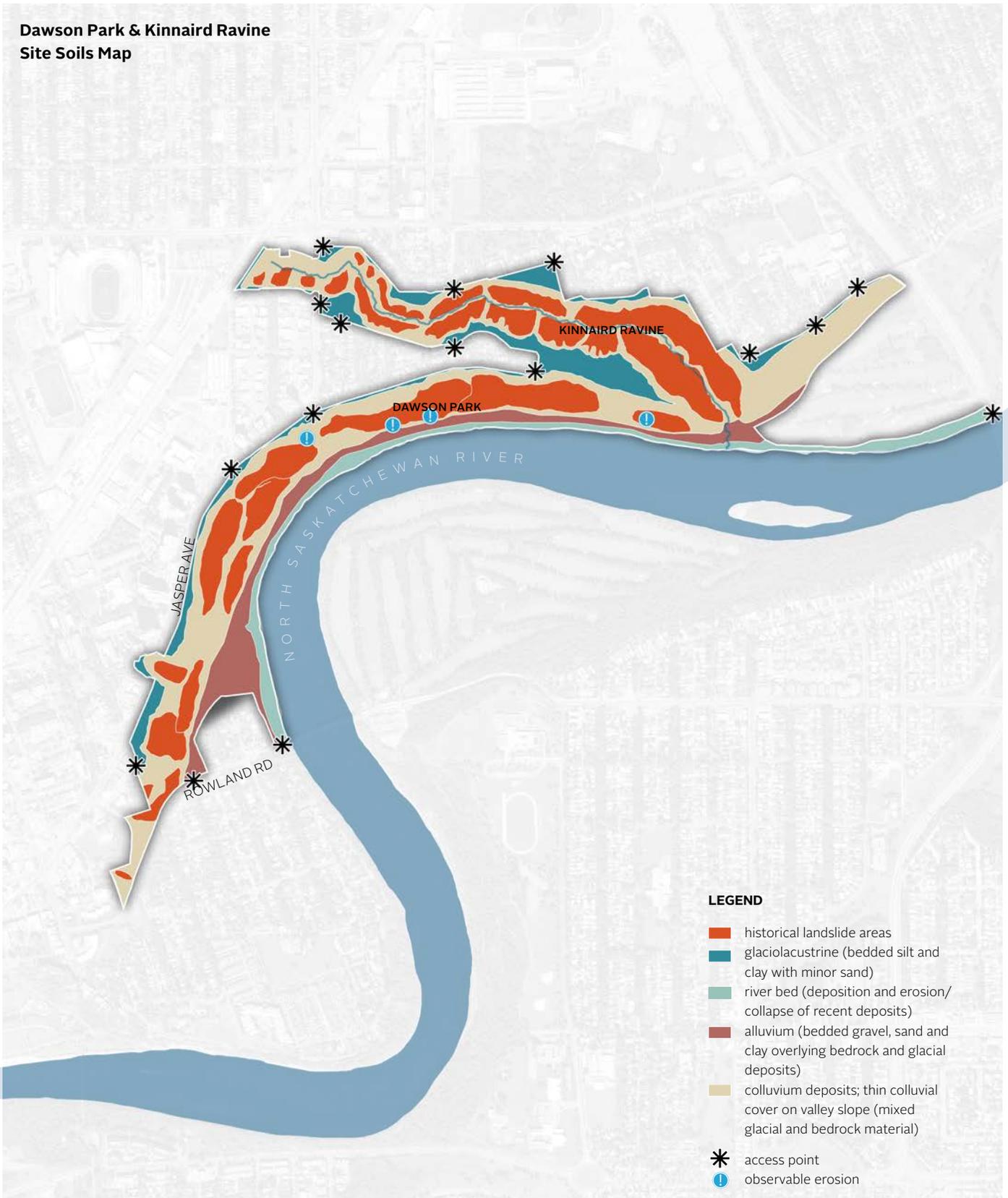
No significant retrogression has occurred in Dawson Park and Kinnaird Ravine in the time available from the air photos (1978-2010), however, **signs of previous landslides were noted along the valley slopes along with several erosion channels. These slopes are considered marginally stable.**

In general, runoff potential would be expected to be higher on more sloping terrain and where soils of low permeability are present at ground surface. Frost heave potential is generally greatest in fine grained soils with high silt contents, moderate in clays and low in clean gravels and clean sands. Frost heave is also generally higher in areas with high groundwater table. Swell/shrink potential is greatest in clay soils of high plasticity, moderate in medium plastic clay and low in plastic clays, sands and gravels. Infiltration capacity is greatest in pervious gravelly and sandy soils. On this basis, **Dawson Park and Kinnaird Ravine have high runoff potential and low to moderate frost heave potential, swell/shrink potential and infiltration capacity.**

Recommendations:

It is recommended that vegetation on the valley slopes, especially in erosion channels, be maintained or restored to help stabilize the soils. Any grading that is proposed on or near a slope should be carefully assessed by a geotechnical engineer to determine the feasibility and any potential remedial measures that are required to maintain the Factor of Safety at a reasonable level.

**Dawson Park & Kinnaird Ravine
Site Soils Map**



LEGEND

- historical landslide areas
- glaciolacustrine (bedded silt and clay with minor sand)
- river bed (deposition and erosion/collapse of recent deposits)
- alluvium (bedded gravel, sand and clay overlying bedrock and glacial deposits)
- colluvium deposits; thin colluvial cover on valley slope (mixed glacial and bedrock material)
- * access point
- ! observable erosion



Site Vegetation

Methodology:

Vegetation analysis for Dawson Park and Kinnaird Ravine included a desktop review of LiDAR data and a field assessment in the park area. A background search of the Alberta Conservation Information Management System (ACIMS) database was also completed.

Summary of Features:

Native vegetation is minimal in the Central Parkland Subregion due to intensive cultivation and urbanization (NRC 2006). Native plant species within the Subregion include, but are not limited to, trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), white spruce (*Picea glauca*), Labrador tea (*Thermopsis rhombifolia*), feathermosses (*Hylocomium splendens*), willow (*Salix* spp.), common cattail (*Typha latifolia*), bulrush (*Typha* spp.), bunchberry (*Cornus canadensis*), wild lily-of-the-valley (*Maianthemum canadense*), wild sarsaparilla (*Aralia nudicaulis*) and beaked hazelnut (*Corylus cornuta*) (NRC 2006).

Vegetation within the North Saskatchewan River Valley is dominated by trembling aspen and balsam poplar with pockets of black and white spruce. Riparian areas that are not treed are dominated by grasses, sedges and shrubs. Approximately 487 vascular plant species (e.g., trees, shrubs, forbs/herbs, grasses, sedges, aquatics, rushes, ferns and carnivorous plants) inhabit the North Saskatchewan River Valley (Hobson et. al 2008).

A background search of ACIMS database resulted in no reported rare plant species or ecological communities within the project area (AEP 2016). Two non-sensitive plant species were identified within the Study Area; however, there is a low probability that these species have the potential to occur on site:

- » creeping ancygid (*Ferrissia rivularis*), observed in 2001
- » smooth sweet cicely (*Osmorhiza longistylis*), observed in 2002, 2003 and 2013

An additional background literature review determined moderate potential for presence of the following species:

- » callicladium moss (*Callicladium haldianum*)
- » leskea moss (*Leskea gracilescens*)
- » frosted rim-lichen (*Lecanora caesionubella* ssp. *saxiomtana*)
- » smooth sweet cicely (*Osmorhiza longistylis*)
- » flat-topped white aster (*Doellingeria umbellatus*)
- » wild comfrey (*Cynoglossum virginianum* var. *boreale*)
- » dark-green goosefoot (*Chenopodium atrovirens*)
- » lance-leaved loosestrife (*Lysimachia hybrida*)
- » porcupine sedge (*Carex hysterecina*)
- » and river bulrush (*Bolboschoenus fluviatilis*)

During the field assessment conducted on July 12, 2016, 64 plant species were observed in the project area. **Among the observed species, 50 species (79%) were native, while 14 (21%) species were exotic, including noxious weeds** (i.e. Canada thistle, perennial sow thistle, white cockle, common burdock and scentless chamomile). Among the observed trees, 10 species appeared to have been planted as part of the Capital City Recreation Park Concept Plan development in the 1970s. **No vegetation Species at Risk were identified in the project area.**

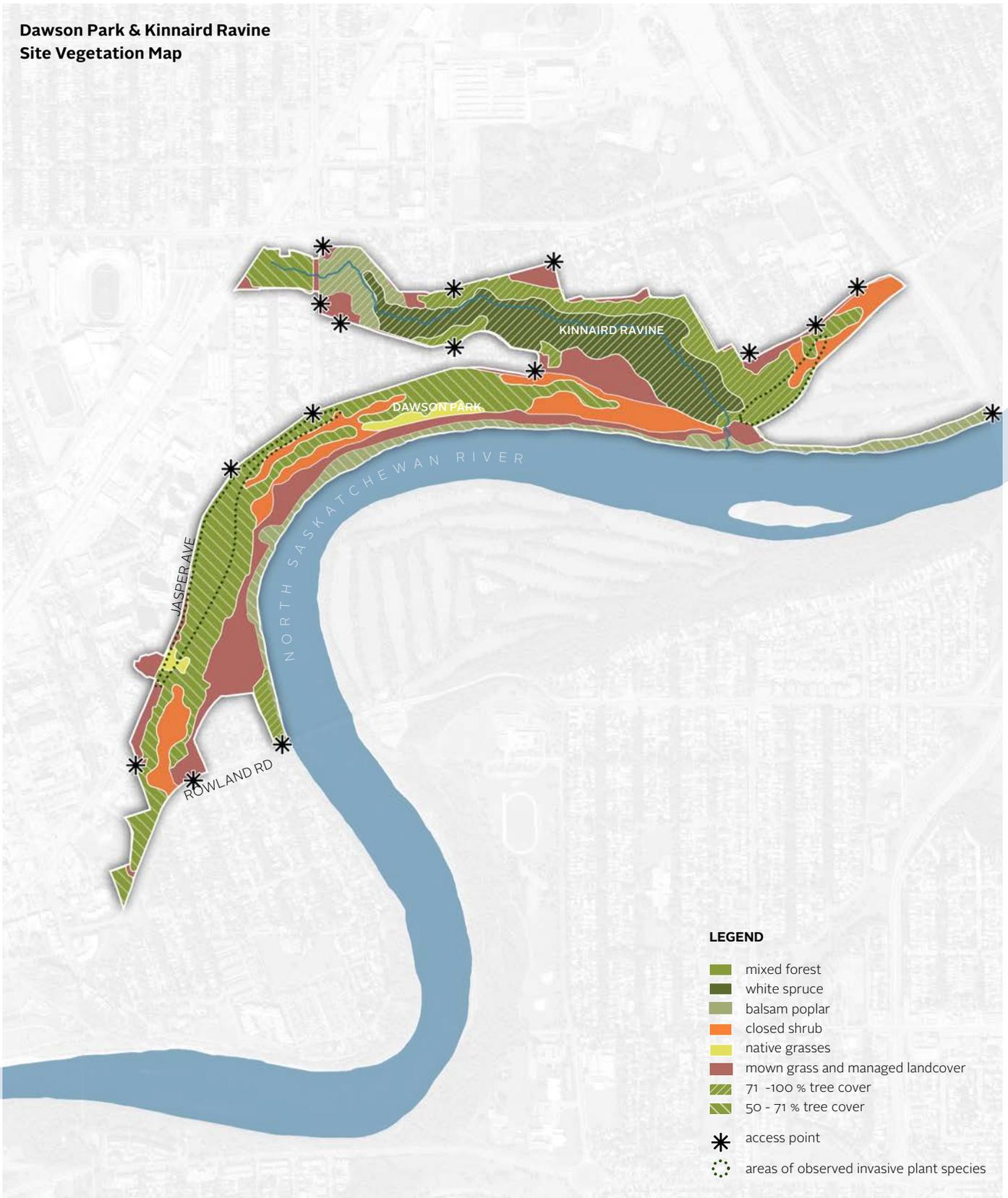
During the rare plant survey assessment on August 6, 2016, flat-topped white aster and dark-green goosefoot were not detected within the study area, although the survey was conducted during the optimal blooming season for these species. In addition, *Callicladium haldianum*, *Leskea gracilescens*, and frosted rim lichen were not observed within the study areas. These species would have been detected if they occurred on site.

A population of leafy spurge was observed in Dawson Park - approximately 300 individuals in an area approximately 10 metres in length along the paved path way and 6 metres in width. Several populations of creeping bellflower and yellow clematis were detected as well. Scattered occurrences of noxious weeds (i.e. common tansy, white cockle, Canada thistle, woolly burdock, scentless chamomile, and yellow toadflax) were noted throughout. Common buckthorn (*Rhamnus cathartica*), which is a prohibited species, is likely to exist in the park. All potential and observed species are listed in the Environmental Overview.

Recommendations:

The sensitive plant species survey was conducted past the blooming season of smooth sweet cicely, wild comfrey, lance-leaved loosestrife, porcupine sedge, and river bulrush. However, Dawson Park has limited habitat suitability for these species providing a low to moderate potential of occurrence within suitable habitat on site. Prior to ground disturbance associated with park improvements within the suitable habitat on site for these species, a targeted species survey should be conducted by a qualified biologist to determine if these species are present within the areas of proposed ground disturbance. If they are present, then a Rare Native Plant and Lichen Survey Form should be completed and submitted to the Conservation Data Centre to document the occurrence of the sensitive species. The Master Plan will consider the requirements and budget allowance to mitigate invasive species and noxious weeds in the project area. Invasive tree species, such as caragana, would need to be replaced if removed according to the Corporate Tree Management Policy.

**Dawson Park & Kinnaird Ravine
Site Vegetation Map**



LEGEND

- mixed forest
- white spruce
- balsam poplar
- closed shrub
- native grasses
- mown grass and managed landcover
- 71 -100 % tree cover
- 50 - 71 % tree cover
- * access point
- areas of observed invasive plant species



Habitat Potential and Human Impact

Methodology:

A desktop analysis of habitat potential based on human impact was completed. The human impact measure represents the combined impacts of paved and unpaved circulation routes, human-centric and disturbed landscapes, off-leash dog areas and shallow slopes (which are more easily accessible by people) on habitat potential. In Dawson Park and Kinnaird Ravine, the highest human impact on wildlife is likely where pathways, shallow slopes and off-leash dog areas converge. These areas are highlighted in red on the map.

In addition to desktop analysis, a review of the Alberta Fisheries & Wildlife Management Information System (FWMIS) and a field assessment were completed.

Summary of Features:

A FWMIS database search was conducted to assess the potential for the presence of wildlife within a 2 km radius of the project area. Wildlife species of conservation concern that have the potential to occur within the project area include:

- » barred owl (*Strix varia*)
- » northern leopard frog (*Rana pipiens*)
- » northern long-eared bat (*Myotis septentrionalis*)
- » and short-eared owl (*Asio flammeus*)

The **barred owl** (*Strix varia*) is currently listed as Sensitive under Alberta Wildlife Act. In Alberta, there may be fewer than 2,000 breeding birds remaining. Given the species' preference of mature dense forest, habitat fragmentation is detrimental and should be avoided through forest management practices and planning.

The **northern leopard frog** (*Rana pipiens*) population has experienced a severe decline since the late 1970s. The species has disappeared from most of northern and central Alberta, but may still be found in Southern Alberta. Protection of remnant breeding areas is required. The northern leopard frog is listed as Threatened under the Alberta Wildlife Act, and Special Concern under Schedule 1 of the Species at Risk Public Registry (SARA).

The **northern long-eared bat** (*Myotis septentrionalis*) population size is unknown, and the species does not appear to be widely distributed. The northern long-eared bat relies on early decay trees for roosting. It is listed as May be at Risk under Alberta Wildlife Act.

The **short-eared owl** (*Asio flammeus*) population has been declining for the past 40 years, potentially due to habitat loss and degradation. It is listed as a species of Special Concern

under Schedule 1 of SARA and May be at Risk under the Alberta Wildlife Act. The short-eared owl often resides in Southern Alberta, typically nesting in the ground of grasslands and foraging in open spaces. Although there is potential for this species to be found in the region, it is unlikely to be present within the project area.

Several wildlife species were observed or deemed to be present based on the signs of their activity in the project area during the biological survey on July 12, 2016. Audio and/or visual observations led to the identification of 19 species of birds in the project area. Deer tracks were noted during the visit, suggesting presence of deer in the project area. Eleven nests were also noted: eight potentially belonging to magpie, two to either magpie or crow, and two to American robin. **No federally listed Species at Risk were observed during the field visit.**

During the second field visit on August 6, 2016, a nest that either belonged to Cooper's hawk or sharp-shinned hawk was observed. All potential and observed species are listed in the Environmental Overview.

Recommendations:

Depending on the commencement date and duration, construction activities in support of Dawson Park and Kinnaird Ravine improvements and development may impact wildlife species habitat. **The removal of vegetation can cause long-term habitat loss and/or fragmentation, but these impacts may be minimized by planting native trees, shrubs and grasses once the project work is complete.**

Due to the number of bird species observed during the field visit, it is recommended that potentially damaging construction activities occur outside of the migratory bird breeding season. Should the construction activities occur during the breeding bird season, then a nest sweep will be required no more than seven days prior to clearing and construction. If an active nest is found, then the appropriate buffer will be required.

Pinch points where human activity have the highest influence on habitat potential include the mouth of Rat Creek, the trails along the River Valley slopes and the dogs off-leash area on Jasper Avenue. These are potential areas for habitat restoration.

**Dawson Park & Kinnaird Ravine
Human Impact Map**



LEGEND

human impact gradient

low high

* access point



Visual Assets and Sensory Experience

Methodology:

The Visual Assets and Sensory Experience findings are based on observations made during site visits by the consultant team.

Summary of Features:

Dawson Park and Kinnaird Ravine offer the community many visual experiences, including views into the River Valley, enclosed forest experiences and close-up views of the river. There are three official viewpoint locations and many other informal viewpoints along Jasper Avenue that provide exceptional views of the River Valley and adjacent neighbourhoods.

Since Dawson Park and Kinnaird Ravine are located in close proximity to downtown Edmonton, visitors and wildlife within the park also experience some sensory disturbances caused by urban development. Jasper Avenue is a busy downtown arterial road and is a source of traffic noise and vehicle exhaust. Wayne

Gretzky Drive NW is also a source of noise and pollution. Some members of the public have mentioned that motorized water vehicles, including speed boats, create unwanted noise in the River Valley. Forested areas of the park provide a buffer from noise pollution for park visitors.

There is a noticeable odour near the stormwater outflow structure in Dawson Park that creates a negative sensory experience and may point to issues with water quality where the outflow enters the North Saskatchewan River.

Recommendations:

Ensure that future infrastructure recommendations for Dawson Park and Kinnaird Ravine are consistent with River Valley park development. Development should be low impact and maintain a sense of 'escape' from the city.

Odour and Noise

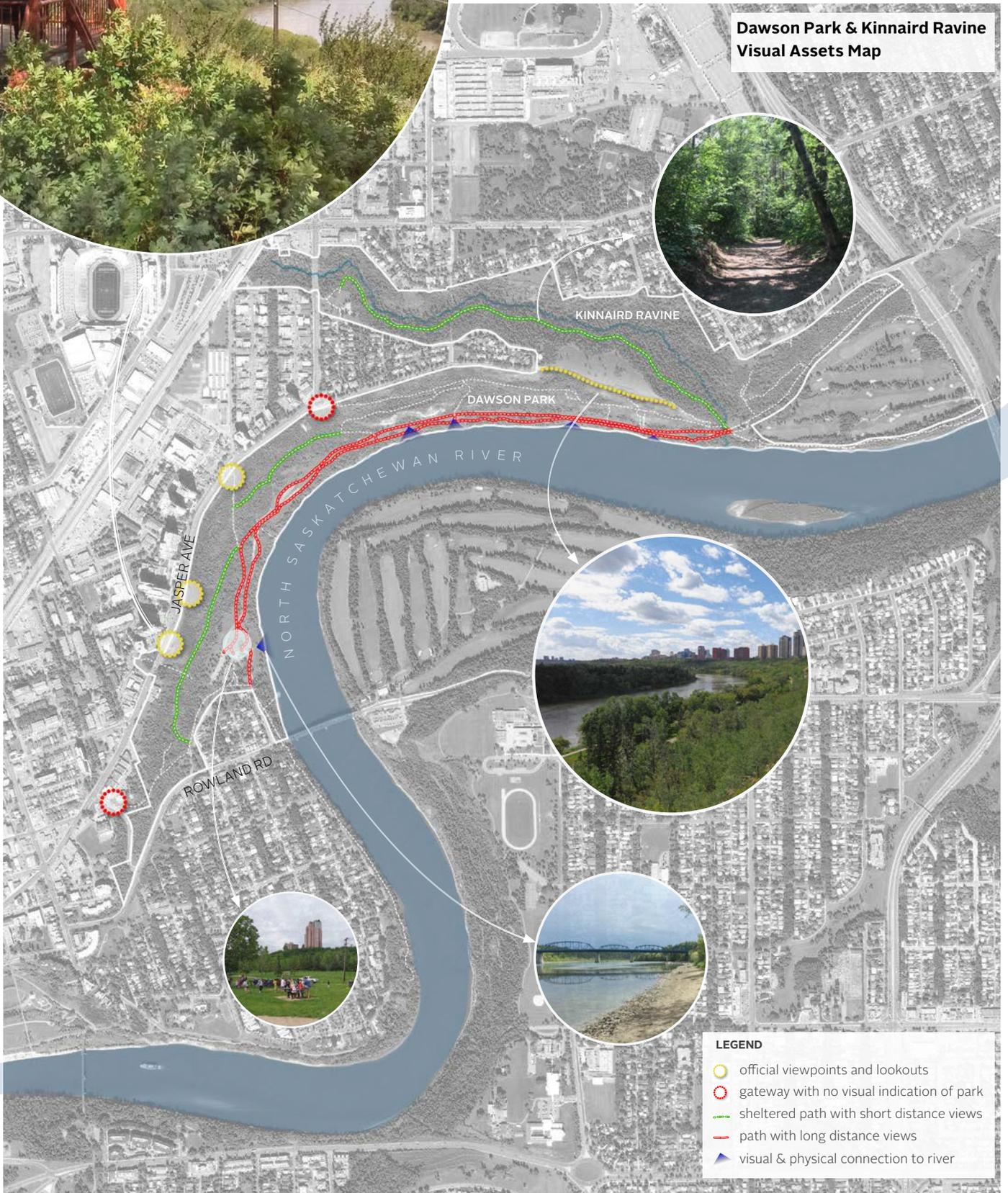


- sheltered with lack of noise
- open & potentially noisy
- noise from water activity
- noise from traffic

0 800 M



**Dawson Park & Kinnaird Ravine
Visual Assets Map**



- LEGEND**
-  official viewpoints and lookouts
 -  gateway with no visual indication of park
 -  sheltered path with short distance views
 -  path with long distance views
 -  visual & physical connection to river



0

800 M

Historical / Archaeological Considerations

Methodology:

Understanding the history of Dawson Park and Kinnaird Ravine is a continuous process, which includes archival and historical research as well as community story-telling. Sources for historical information that have been accessed include:

- » The Edmonton Archives
- » The Historical Resources Act
- » The Alberta Township Survey
- » Public and stakeholder input

Historical Summary:

The history of Dawson Park and Kinnaird Ravine is intertwined with the history of the City of Edmonton. The River Valley is an important cultural landscape for the Indigenous populations who have lived in this region for thousands of years. While the project area is located on Treaty 6 (1876) land, the history of the Indigenous use of the site is not visible to the everyday observer, nor is it recorded in the local archives. **The oral history of the project area should be further explored by connecting with First Nations communities.**

The post-colonial history of the park is more readily available and is relatively well-known by the local community. Dawson Park takes its name from one of Alberta's early geologists and WWI veteran John Forsyth Dawson (1892-1962). Dawson worked in the Turner Valley oil fields and for the Dominion Oil Fields Supply Company in Edmonton. He is not to be confused with his father, H.S. Dawson, for whom the Dawson Bridge was named. A petition circulated in 1912 called for the creation of a city park in the project area, but the park was not officially named until 1990.

In the late 19th and early 20th centuries, coal mining seems to have been the predominant activity in the park region, stretching from Fraser Flats (now Riverdale) to the Kinnaird Ravine and beyond. All of the mines were underground. Mining labour at Penn Mine (Mine 632) was performed by inmates of the nearby penitentiary. Some private residences were also located in this area and there is some evidence of a homestead and agricultural activity. In 1932 and 1933, remediation payments were made to homeowners whose properties were adversely affected by their location above abandoned mines. Heritage homes are still present around Dawson Park and Kinnaird Ravine and provide a link to the local community's history.

The power of the North Saskatchewan River was felt by communities around Dawson Park and Kinnaird Ravine on June 27, 1915 when the river flooded for several days from an unprecedented amount of rain. About 2,000 people were displaced, 50 buildings were destroyed and over 700 homes

were submerged in the flood. The neighbourhoods most affected by the flood were Cloverdale and Rosssdale, south of today's Dawson Park.

Kinnaird Ravine has played a significant role in the history of Edmonton. The North West Mounted Police are believed to have camped there in a final stop before reaching Fort Edmonton in the 19th century. In 1914, the City of Edmonton proposed Kinnaird Ravine's designation as a park. The urban fill and development north-east of Kinnaird Ravine resulted in a significant decrease in the flow of the watercourse.

There are opportunities within the park to commemorate historical figures, such as George J. Kinnaird (1857-1922), Sheriff Walter Scott Robertson and Jane Thompson Salisbury, as well as events that are important to Edmonton's history.

Historic Resources:

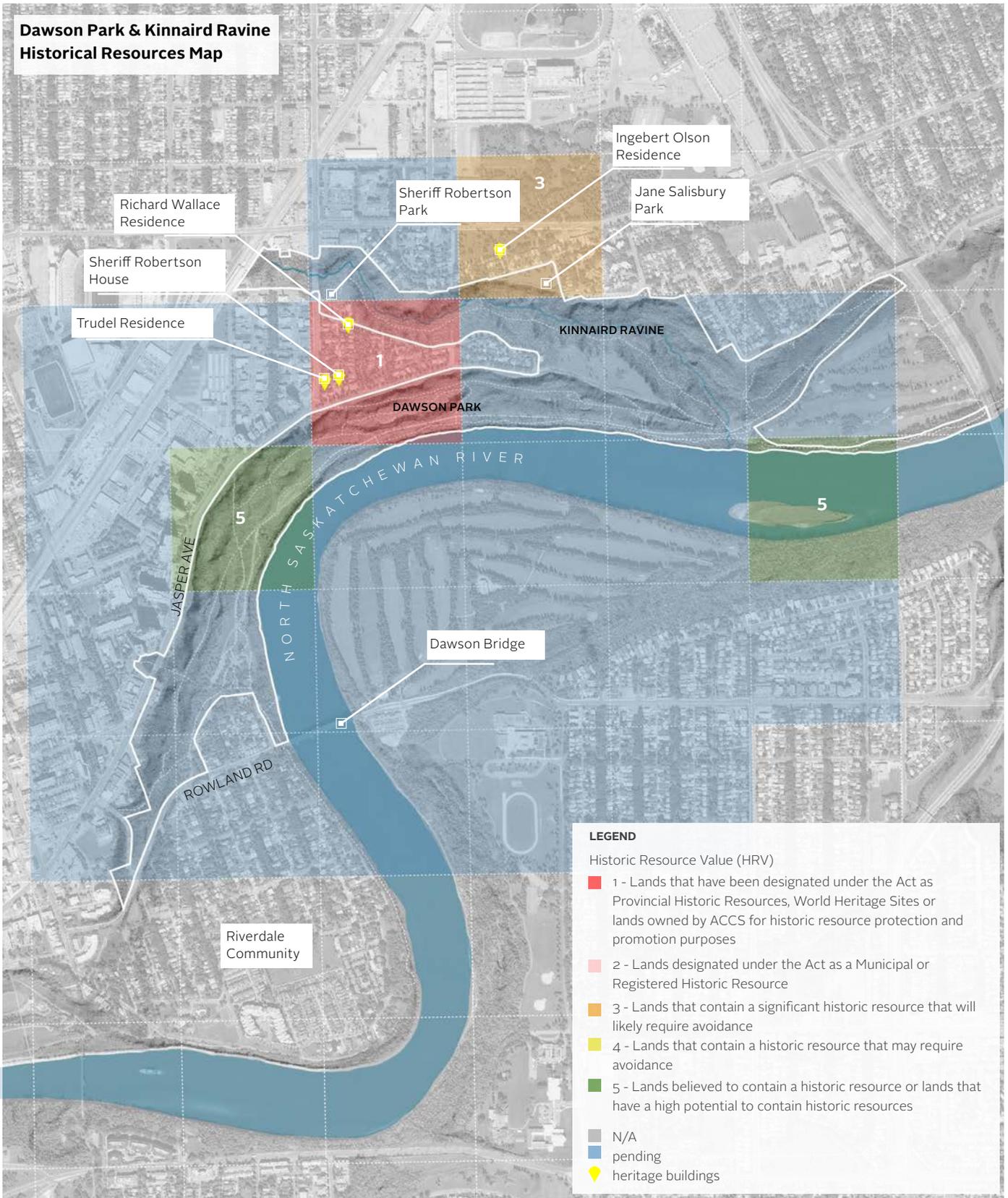
A request for the location of historic sites within Dawson Park and Kinnaird Ravine was submitted to Alberta Culture as it is the intent to avoid mitigation requirements where design can be used to achieve zero impact on resources. Information is currently available for historic resources within the Alberta Township Survey (ATS) system and according to Historic Resource Value (HRV) from the Historical Resources Act.

The Historic Resource Value (HRV) is a number assigned to an area of land according to the classification of historic resources that lie within that area. Areas with a class of '0' have undergone investigation that has resulted in limited returns or show that the site has been heavily disturbed or destroyed. There are no areas with a class of '0' in the project site. Areas with a class of 1 or 2 are located outside the boundaries of the project area. (See the map on the following page.)

Recommendations:

A cultural landscape study is recommended for this site. If the area is subject to an Environmental Assessment, a Historic Resources Impact Assessment will be required. An oral history based on contributions from aboriginal Elders is essential to understanding the cultural landscape of the park area.

**Dawson Park & Kinnaird Ravine
Historical Resources Map**



0

800 M

Environmental Sensitivity Analysis

Key findings from each factor in the previous section have been included in the environmental sensitivity analysis, guided by the 1992 Ribbon of Green Master Plan. The following sensitivity classes will help to outline a range of development suitability within the park and will contribute to opportunities and constraints for the Master Plan.

Analysis Overview

As a response to the City of Edmonton's requirement for environmental sensitivity mapping for the Dawson Park and Kinnaird Ravine Master Plan project, a desktop analysis of ecological sensitivities within the project boundaries was performed. The environmental factors presented earlier in the report contribute directly to the sensitivity analysis. The methodology of the analysis aligns closely with the Resource Analysis Process in the Ribbon of Green Master Plan (1992). Five resource types were classified using GIS software according to their sensitivity to potential development. The five resource types include:

- » vegetation
- » habitat potential
- » slope
- » hydrology
- » and geology/soils.

See the Resource Sensitivity Table on page 27 and the maps on pages 25-27 for a visualization of the resource sensitivity analysis within the project area. Below is a short description of each resource type and the implications of its sensitivities.

Vegetation

The relative tree cover in Dawson Park and Kinnaird Ravine is high compared to surrounding land uses. The most sensitive vegetative regions in the project boundaries include areas that are densely covered in tree species such as aspen, balsam poplar and spruce trees. Development in these areas would cause severe impacts to potential wildlife habitat, including Rat Creek, and more established tree stands. Development within the highest sensitivity area should be avoided, and impacts from development in other areas of the park should be monitored.

Habitat Potential

The highest habitat potential was determined to exist in areas that have the least likelihood of human impact from day-to-day park use. Areas along the trails and on flat land are the most likely to be impacted and therefore have the least habitat potential. Areas along the slopes, especially in Kinnaird Ravine where there are limited trails, have the highest habitat potential. Development implications to wildlife habitat should be considered in the directives of the Master Plan.

Slope

Slopes with a grade of over 15% pose challenges for development. These slopes are not physically accessible for people of all abilities. They also have more potential for erosion, slope failure or construction difficulties. Major development should not occur on slopes over 15% and universally accessible pathways/entrances should be pursued whenever possible.

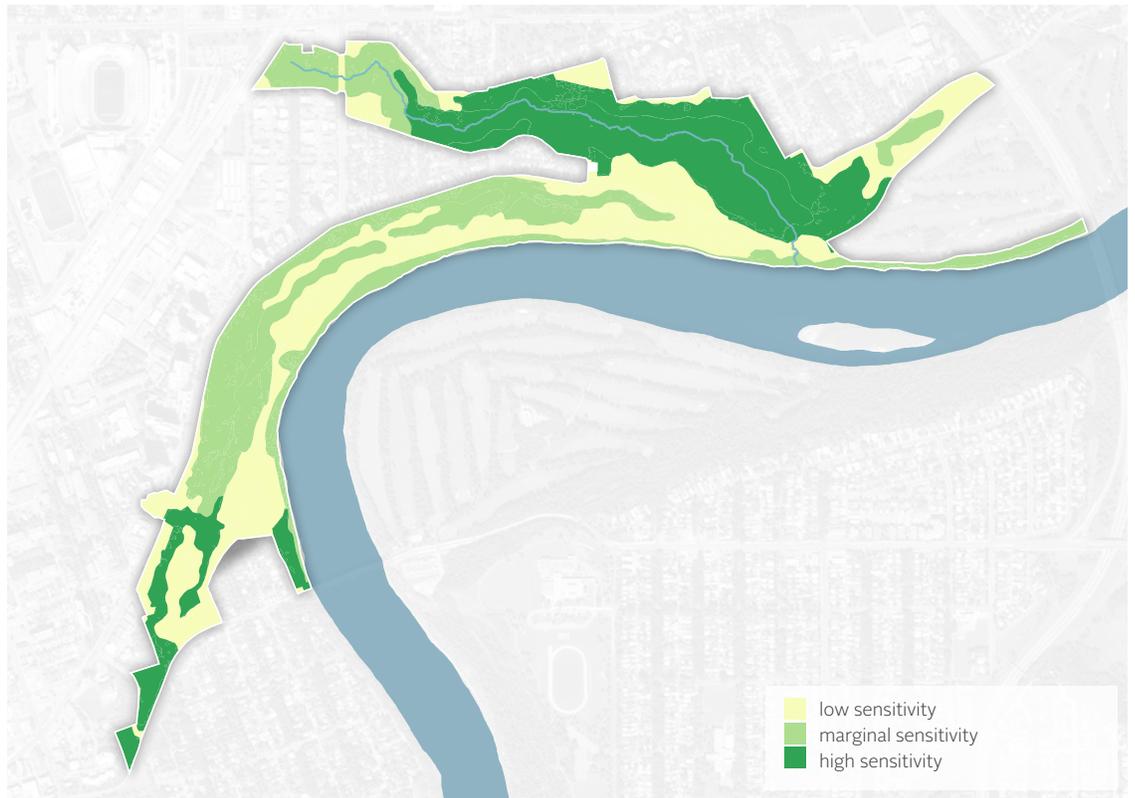
Hydrology

Surficial drainage was analyzed to determine hydrological sensitivity in this analysis. Potential drainage courses across the site including Rat Creek are sensitive zones where development could impact the quality of water flowing into the North Saskatchewan River. Three wetland-like areas located near Rat Creek are also potential habitat zones and areas of ground water seepage. Development should not occur in close proximity to these features.

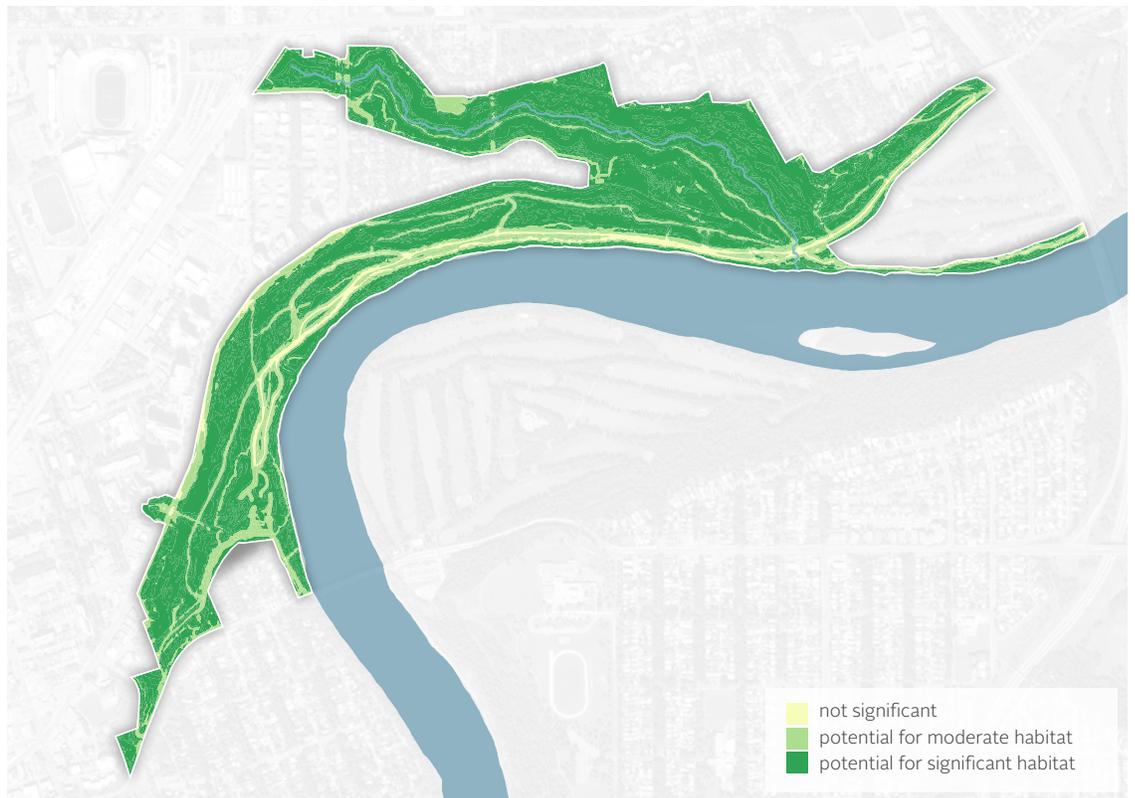
Geology/Soil

Areas of potential slope failure or landslides are the most sensitive areas in relation to geology and soil in Dawson Park and Kinnaird Ravine. Extra precaution should be taken in areas where the slope is over 30%. Development should not occur in these areas, and slope stability measures may be required to mitigate existing erosion.

Vegetation



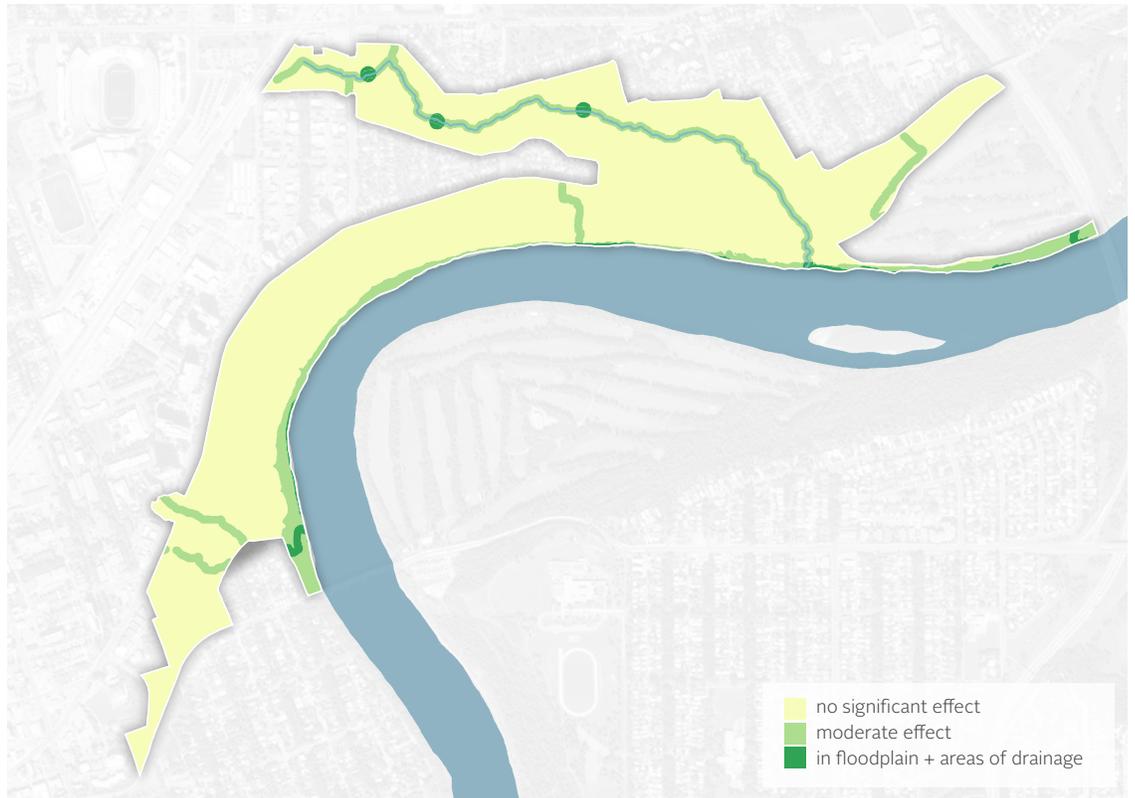
Habitat Potential



Slope



Hydrology



Geology/Soil



Resource Sensitivity Table

Vegetation	Definition:
low sensitivity	significant vegetation does not exist or exists in low density; vegetation can withstand some degree of mechanical damage and/or environmental change with minor reclamation; park maintenance occurs
marginal sensitivity	tree cover is 31-70%; vegetation can withstand some degree of damage/change with major reclamation; some minor park maintenance occurs
high sensitivity	tree cover is 71-100%; any damage/change would result in severe impacts which could not be mitigated; no/little park maintenance occurs
Habitat Potential	
not significant	human disturbance has eliminated/reduced natural habitat
potential for moderate habitat	some wildlife species exist however numbers are not significant; human influence is present
potential for significant habitat	area contains abundant wildlife species; areas are relatively inaccessible by humans
Slope	
flat/minor slope	0-7.5% slope
moderate incline	7.6-15% slope
steep/hazardous slope	> 15% slope, steep banks
Hydrology	
no significant effect	no drainage impacts/drainage controlled
moderate effect	within watercourses or seasonal drainage (10m buffer) or within the 1:100 year flood line
in floodplain + areas of drainage	within the 1:100 year flood line and drainage areas or observed wetland areas (20m buffer)
Geology/Soils	
stable	no evidence of slope failure, soils exhibit low erosion potential
marginal stability	evidence of potential slope failure from aerial analysis
unstable	evidence of potential slope failure from aerial analysis and > 30% slope

Overall Environmental Sensitivity

In the Overview of Environmental Factors, site-specific features were illustrated to explain characteristics that contribute to ecological sensitivity within the project area. Features were attributed weights in the Environmental Sensitivity Analysis based on their characteristics and using guidelines from the Ribbon of Green Master Plan. The sensitivity maps produced for vegetation, habitat potential, slope, hydrology and geology/soils were overlaid to produce a sensitivity map of the site that integrates all five resource types.

The resulting map outlines three overall levels of sensitivity throughout the park area: higher, moderate and lower sensitivity. Areas where several highly sensitive resource types exist result in a higher overall sensitivity score, highlighting areas that would more likely experience ecological damage from recreational use or park development.

The following describes the City of Edmonton's recommended management practices for each level of sensitivity with the goal of reducing negative ecological impacts in River Valley parks:

Higher Sensitivity Areas

Higher sensitivity areas should be restricted for the protection of natural resources. This could include areas that are very steep, areas that create habitat for sensitive species or areas with unique geological features. Suggested management practices include the restriction of development, routine maintenance, restricted wildlife control and only emergency safety and security services.

Moderate Sensitivity Areas

The interaction of natural resources and people should be managed in Moderate Sensitivity Areas to prevent unnecessary environmental impacts. Moderate Sensitivity Areas could include areas that are characterized by some human disturbance with considerable native vegetation and wildlife habitat intact. Suggested management practices include development limited to trails, routine garbage pick up and trail edge maintenance, limited wildlife control, some habitat restoration and some safety and security services.

Lower Sensitivity Areas

Lower sensitivity areas have experienced the most ecological degradation and, therefore, are the most suitable for many types of park activities if increased active use is desired. However, degraded areas also have the greatest potential for ecological restoration. Restoration efforts should be explored whenever possible.

Extensive Use

Extensive Use is a term that describes the recreational use of River Valley parks in the City of Edmonton. The term is borrowed from the 1992 Ribbon of Green Master Plan in which Extensive Use recommendations include higher impact activities that are appropriate for the lowest sensitivity areas. The City of Edmonton's priorities relating to the management of River Valley park land have shifted since the 1992 Ribbon of Green Master Plan. Instead of recommending Extensive Use in degraded areas, the City's focus is to restore habitat and ecologies where possible.

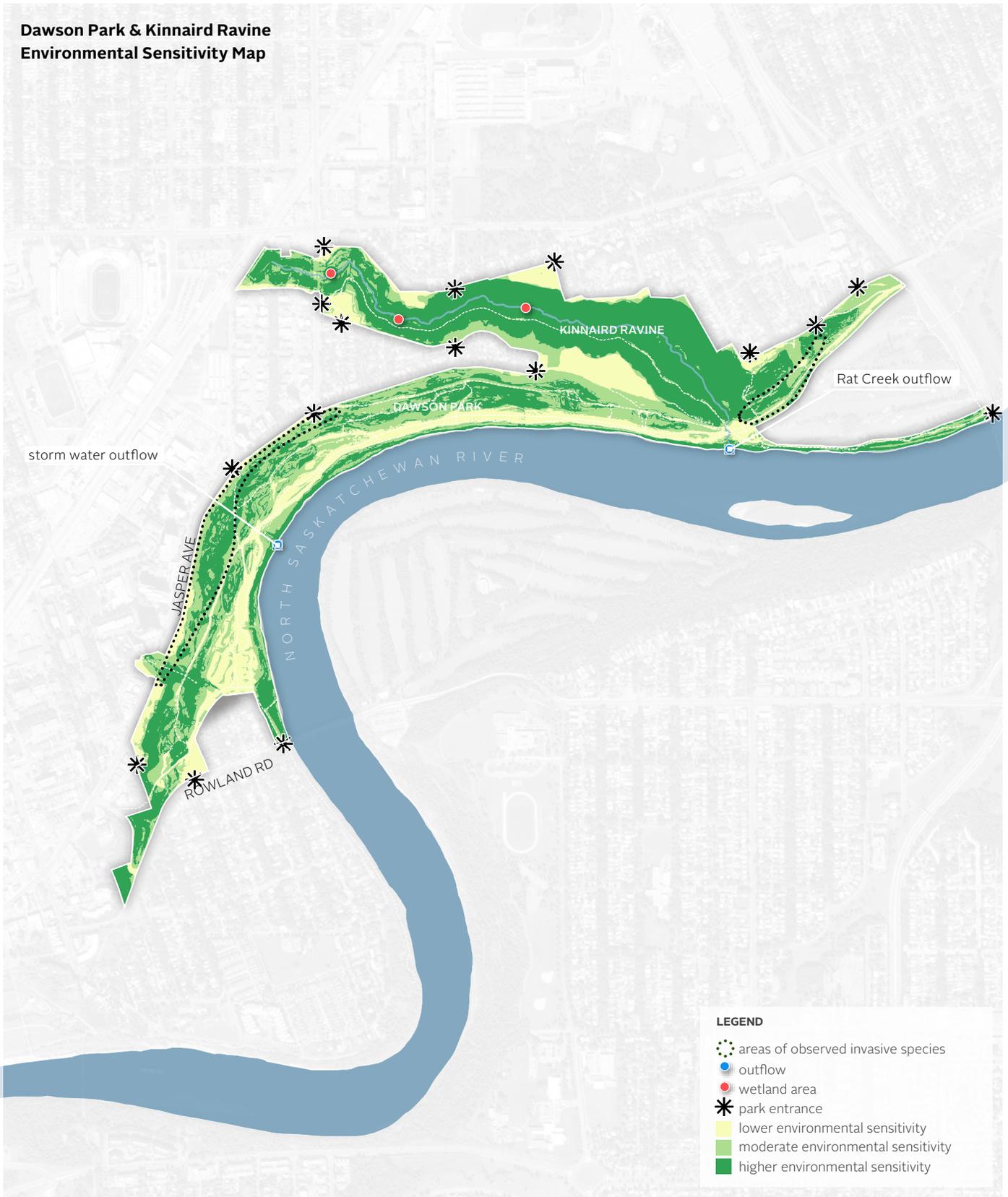
Extensive Use activities may create a high or low environmental impact and could potentially occur within any sensitivity zone. **Activities occurring in higher sensitivity areas will be subject to greater ecological impacts than those in lower sensitivity areas.** Impacts could include the removal, destruction or disturbance of natural features for the implementation of proposed recreational activities.

Proposals for activities within River Valley parks are driven by City priorities and public input, resulting in a range of desired activity levels and ecological impacts that must be calibrated according to the sensitivity of the site. Proposals for Extensive Use should be overlaid with the sensitivity analysis to understand the potential ecological impacts that exist and the feasibility of the proposed activity. It should be noted that Extensive Use and restoration are not mutually exclusive management techniques. **Innovative and sensitive design has the potential to create opportunities for engaging recreational activities while at the same time providing ecological benefits.**

Dawson Park & Kinnaird Ravine

Most of the park area is classified as highly sensitive to ecological impacts from development. The steep River Valley slopes, dense vegetation (especially in Kinnaird Ravine) and relatively high habitat potential all contribute to a higher ecological sensitivity. For these reasons, it is recommended that design, planning and management of the sensitive areas of the park align with the directives for Higher Sensitivity Areas according to the Ribbon of Green Master Plan (1992) and ongoing City of Edmonton policy regarding River Valley park management. Higher impact activities are most suited to Lower Sensitivity areas.

**Dawson Park & Kinnaird Ravine
Environmental Sensitivity Map**



LEGEND

- ◌ areas of observed invasive species
- outflow
- wetland area
- * park entrance
- lower environmental sensitivity
- moderate environmental sensitivity
- higher environmental sensitivity



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Landscape Units: An Understanding of Dawson Park & Kinnaird Ravine Moving Forward

The site-specific features that were used to inform the sensitivity analysis were also used to develop landscape units, which are areas with similar ecological characteristics throughout the park. **Each of the landscape units has a unique set of opportunities and constraints that will help shape the Master Plan. The unique characteristics along with the sensitivities of each landscape unit will help to define what activities should and should not occur in that area.** The landscape units in Dawson Park and Kinnaird Ravine are summarized below, with an explanation of the key features and concerns within each unit.

River Valley Slopes

This area is characterized by steep, undulating terrain with evidence of past erosion and landslides. The vegetation is characterized by densely growing shrubs and trees, creating potentially valuable habitat for bird and small mammal species. Much of the historic mining and logging activity in the park occurred on the River Valley slopes, contributing to the existing mix of native and non-native vegetation, including noxious weeds. Natural trails, one of which is an off-leash trail, run at different levels along the slopes in Dawson Park. These trails are used by pedestrians, dog-walkers, mountain bikers and hikers throughout the year. **Management of this landscape unit should generally follow the guidelines for Moderate Sensitivity Areas.**

Mobility Corridor

The flat nature of this portion of the landscape facilitates human use. The multi-use regional trail runs through this zone between the River Valley slopes and the top of the river bank. This landscape unit is characterized by its flat nature, asphalt paved trail, manicured grass borders and grass fields. At the south-west end of the park, the corridor is also host to a more active zone with a number of facilities and amenities. The Dawson pavilion has bathroom facilities, a sheltered picnic area, a number of picnic tables, a large open field and a parking lot. **Management of this landscape unit should generally follow the guidelines for Lower Sensitivity Areas.**

River Edge

This landscape unit forms the belt along the edge of the North Saskatchewan River. It is characterized by a rather abrupt and steep drop of roughly 3 m to the river with no transitional wetland area. This makes the river difficult to access from the park's river edge. Few facilities currently exist to help people access the water. Various informal paths down to the river exist along the entire stretch of the river edge in Dawson Park. The vegetation of the area is a mix of native and non-native species, which also aids in stabilizing the edge. **Management of this landscape unit should generally follow the guidelines for Higher Sensitivity Areas.** If facilities are created to aid in river access, ecological impacts of development should be fully understood and mitigated wherever possible.

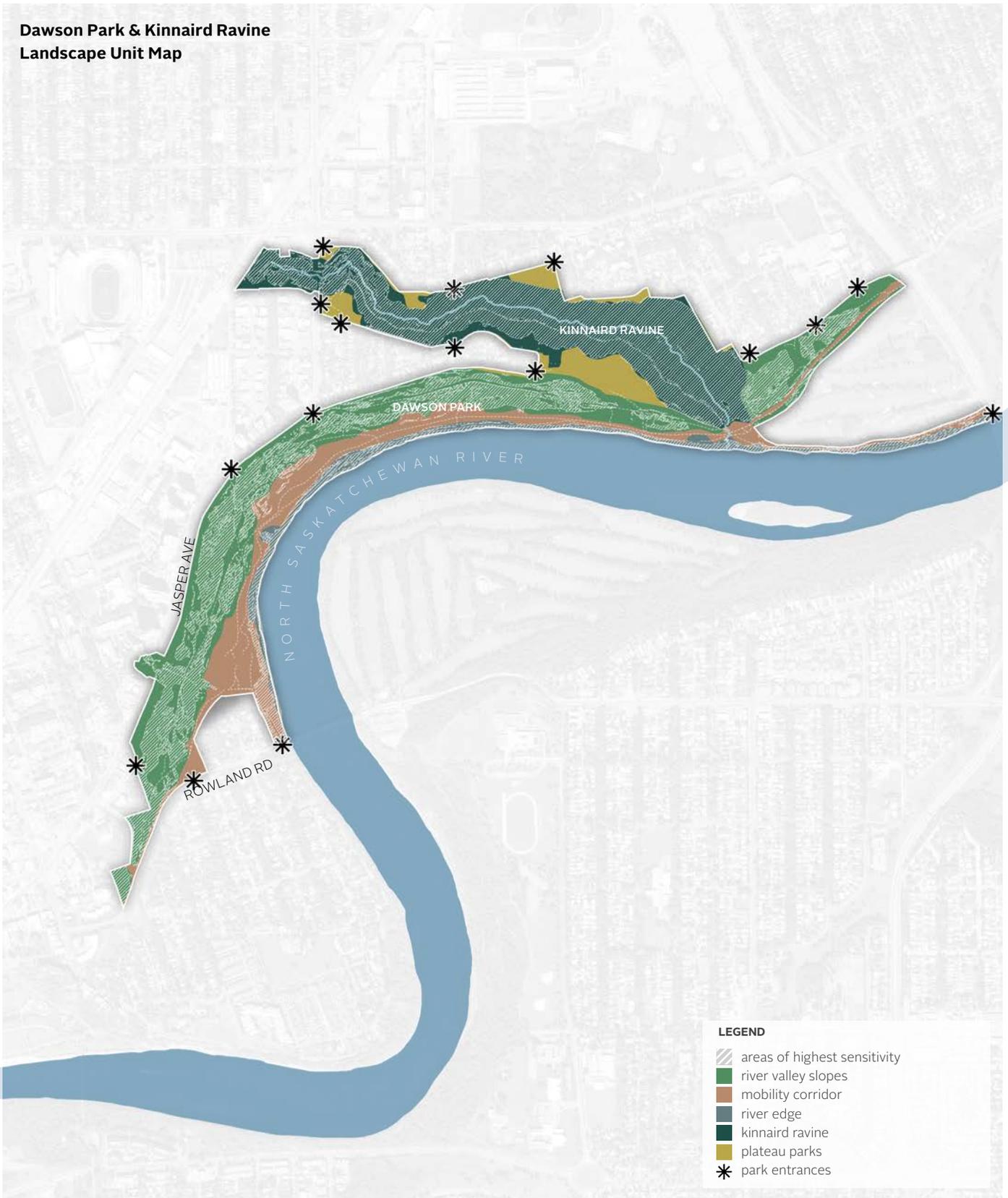
Kinnaird Ravine

The ravine's steep slopes and the high number of evergreens give it a dense, secluded and almost mysterious nature. A single gravel path is the main route through this landscape unit. It is likely to have a high habitat value for wildlife because of its dense upper story and understory growth as well as the inaccessibility of large portions of the ravine to human activity. Rat Creek and its associated wetland areas are important ecological and cultural elements within Kinnaird Ravine. The community has taken stewardship of this landscape unit through community clean-ups and the formation of the Friends of Kinnaird Ravine group. **Kinnaird Ravine has the highest ecological value of any landscape within close proximity to the park. Management of this landscape unit should strictly follow the guidelines for Higher Sensitivity Areas.**

Plateau Parks

These flat parks are part of the upper plateau formation of the landscape above the top of bank. They are therefore easily accessible by people and are mostly pocket parks associated with their nearby communities. Most of the plateau parks have very sparse amenities that could be improved for the benefit of the nearby residents. **Management of this landscape unit should generally follow guidelines for Lower Sensitivity Areas, including exploring the potential for ecological restoration.**

**Dawson Park & Kinnaird Ravine
Landscape Unit Map**



LEGEND

-  areas of highest sensitivity
-  river valley slopes
-  mobility corridor
-  river edge
-  kinnaird ravine
-  plateau parks
-  park entrances



0

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Synthesis

Public consultation, site analysis and City priorities are all considered to determine relevant opportunities and constraints in the project area and to develop the vision, principles and identity of the park.

Environmental Sensitivities and Site Analysis

To develop opportunities and constraints within the project area, all topics and themes presented in this report were considered. To summarize, the environmental factors presented in this report include:

- » Site geology and geomorphology
- » Site hydrology
- » Site soils
- » Site vegetation and wildlife habitat
- » Visual assets and sensory experience
- » Historical/archaeological considerations

The environmental sensitivities analysis presented will be used to guide development and maintenance recommendations in the Master Plan.

Phase 1 Public and Stakeholder Consultation

Public input is an important factor to decision-making in the Master Plan process. During the first phase of public engagement, which occurred in August and September of 2016, the general public and key stakeholders were presented with an Inventory and Analysis of existing conditions in Dawson Park and Kinnaird Ravine. Presented features included: site history; vegetation and habitat; topography and hydrology; access and circulation; site amenities and neighbourhood context. A detailed summary of findings from the public engagement sessions is included in a What We Heard report.

The major topics that emerged from the engagement sessions for Dawson Park and Kinnaird Ravine fell under the following themes:

- » Park Use & Amenities
- » Safety & Maintenance
- » Connectivity & Circulation
- » Nature & Ecology
- » Sense of Place & Heritage

The underlying values of participants became clear through the analysis of their comments and conversations. The values are summarized below.

- » Reduce user conflict (between cyclists, mountain bikers, pedestrians, dog-walkers and runners).
- » Improve amenities that relate to the natural landscape and that do not disturb natural features (for example, picnic tables, boat launches, trail loops, cross-country ski trails).
- » Increase the feeling of safety and decrease the risk of harm in the park by addressing social and maintenance issues, especially on the trails.
- » Increase river access.
- » Provide more opportunities to access the park features and amenities for people of all abilities.
- » Increase points of access into the park from surrounding communities and green spaces.
- » Keep development minimal and maintain the sense of nature that is experienced in the park.
- » Commemorate the history of the park through education initiatives and public art.

These themes and values help to inform the Master Plan by providing direction on the future activities and management practices for the park. To determine if these are appropriate for the park, the environmental sensitivities as well as the appropriate park uses as defined by City plans and policies must be considered.

Moving Forward

The landscape units will form the framework for conversations regarding opportunities and constraints within the project area. The environmental considerations presented in this report as well as the themes and concerns we heard in the first phase of engagement will inform the questions and conversation topics presented to the public. They will also help to form the vision and guiding principles for the park.

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