Bowmont Natural Environment Park

Management Plan — April 2016

Prepared for

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TABLE OF CONTENTS

1 Introduction

Bowmont Natural Environment Park (NEP) is one of Calgary's largest and most beloved natural areas, attracting users from all over the city.

The park contains large swaths of undisturbed riparian, floodplain, and upland ecosystems of the Bow River Valley, and is counted among the most important natural landscapes in the Calgary park system. Bowmont NEP is treasured for its naturalness as well as its recreation value. The park's pathways, trails, open spaces, and off-leash areas are well used by the community while the park landscape provides multiple ecological services such as slope stability, connectivity, biodiversity, wildlife habitat, and resiliency from major flood events. However, balancing resource protection with current and future park use is an ongoing challenge. Sustainable management of Bowmont NEP is essential to the long-term viability of the park as a healthy natural area and enjoyable destination for nature-based recreation.

1.1 Purpose of the Management Plan

The purpose of the 2016 Bowmont NEP Management Plan is to establish sound management direction to balance resource protection with current and future uses of the park. This management plan represents an update to the 2004 Bowmont NEP Management Plan. It has been updated to ensure alignment with current City of Calgary parks planning documents, including plans established after 2004, such as the Calgary Off-Leash Area Management Plan (2010). The updated plan also responds to and addresses a number of major changes and events that have affected the park over the past ten years.

This Management Plan for Bowmont NEP includes the following components:

- An inventory and assessment of current site conditions and resources
- A review of relevant plans and policies influencing park management
- Presentation of the vision and objectives for the park
- Management recommendations to guide balanced resource protection and park use

1.2 History

The natural features of the Bowmont area led the City of Calgary to designate the site as a Natural Environment Park in 1994. In 2004, the Bowmont Natural Environment Park Management Plan was approved by Council. The Plan was developed to address issues and activities contributing to the degradation of Bowmont Natural Environment Park and to outline a strategy to manage and restore the significant natural systems in the park. Since that time, however, a number of significant events, ongoing challenges, and new plans for the park have prompted the need to update the management plan. These factors are described below.

EAST BOWMONT NEP AND STORMWATER FEATURES

One of the most significant changes to Bowmont NEP in recent years is the incorporation of the former Klippert Concrete property into the park as East Bowmont. The Klippert property, located on the lower terrace below Varsity and accessed via Home Road, was privately owned and operated as a gravel pit until 2010. Following acquisition by the City, a Biophysical Impact Assessment (BIA) was conducted for the site prior to establishment of a Design Development Plan (DDP) for the newly acquired lands. Both the BIA and the DDP were completed by O2 Planning + Design Inc. (O2 Planning + Design Inc, 2012; O2 Planning + Design, Inc., 2014). The East Bowmont NEP Design Development Plan outlines a plan to restore the ecological integrity of the area while enhancing recreational and educational values. Phytoremediation of contaminated soils, and naturalized stormwater treatment in the form of marshes and floodplain forests, are important functional elements of the park design (O2 Planning + Design Inc, 2012; O2 Planning + Design, Inc., 2014).

Elsewhere in the park, stormwater management has also been newly incorporated. In 2011, two wet ponds were constructed in the western portion of Bowmont NEP, along the 85th Street Bridge as part of the City's Stormwater Management Strategy. The West Bowmont Wet Ponds, as well as the stormwater elements to be constructed in East Bowmont, are examples of stormwater-quality retrofit facilities prescribed by the Stormwater Management Strategy to improve the quality of water entering the city's rivers.

THE OFF-LEASH AREA MANAGEMENT PLAN AND PILOT OFF-LEASH AREA STUDIES

Issues surrounding the off-leash area boundaries in Bowmont NEP are complex and ongoing. The 2004 Bowmont NEP Management Plan identified two off-leash dog pilot areas in the park. EBA Engineering Consultants was retained to conduct a five-year study of these pilot off-leash areas. Initiated in 2005, the project evaluated the long-term impacts of off-leash dog use on ecosystem health, and prescribed changes to the park's off-leash boundaries to balance resource protection with dog use (EBA Engineering Consultants, 2009; EBA Engineering Consultants Ltd., 2005).

The establishment of the Calgary Off-Leash Area Management Plan (OLAMP) in 2010 reinforced the need to reconsider the park's off-leash boundaries. Under the 2004 Management Plan, the park's off-leash boundaries did not align with the guidelines set forth by the OLAMP. Revisions to Bowmont NEP's off-leash boundaries were required to ensure alignment with the OLAMP and respond to the recommendations of the pilot off-leash area studies (EBA Engineering Consultants, 2009). Proposed changes to the park's off-leash boundaries were taken to the public via stakeholder workshops and an open house as part of the planning process for this updated Management Plan.

PARK ENHANCEMENT AND UPGRADES

Several new developments within the park were completed following a Biophysical Impact Assessment and Restoration Plan for Bowmont NEP by Golder Associates in 2007 (Golder Associates, 2007). These new developments include fencing to control access and restrict off-trail use, trail upgrades, the establishment of a Nature Appreciation Area, and the construction of the Waterfall Valley lookout. Lookout platforms throughout the park were constructed in 2009 and 2010.

THE 2013 FLOOD

Portions of the park are within the 1:100 year floodway and flood fringe (as per Calgary Land Use Bylaw 1P2007). As a result, the 2013 flood in Calgary has affected amenities in the park, and changed the shape and condition of the river bank and riparian environments. Loss of habitat and some damage to park amenities occurred as a result of the flood, and in some locations trail realignment may be necessary. In other places, the flood has exacerbated ongoing riverbank erosion caused by uncontrolled river access, compromising the integrity of some of the trails. Channel migration and the infilling of sediment and debris has affected river access in the southwest portion of the park, but may also provide opportunities for future use where ground cover is protected by gravel, rock, or other hard materials and is therefore resistant to erosion from moderate to high intensity human and animal traffic.

1.3 Planning Process

The planning process for the Bowmont Park Management Overview was initiated in March 2015 and continued through the spring of 2016. Public engagement was a critical component of the planning process, providing important insights into the pressing issues and challenges experienced by park users. The project was broken into three phases, each of which included a public engagement component:

- **Phase 1** consisted of a site analysis, background document review, and gap analysis of the 2004 Management Plan for Bowmont NEP. Public engagement during this phase included stakeholder workshops with key representatives, an online survey, and public open houses to identify key issues and opportunities in the park.

- **Phase 2** built upon the findings of Phase 1 to develop a series of updated management recommendations for the park, along with revisions to the park's off-leash area boundaries. A second round of public engagement was conducted with workshops and open houses to collect public feedback on three hypothetical options for off-leash area boundary changes. Phase 2 culminated in a What We Heard Summary Report, and a Draft Updated Management Plan for the park.

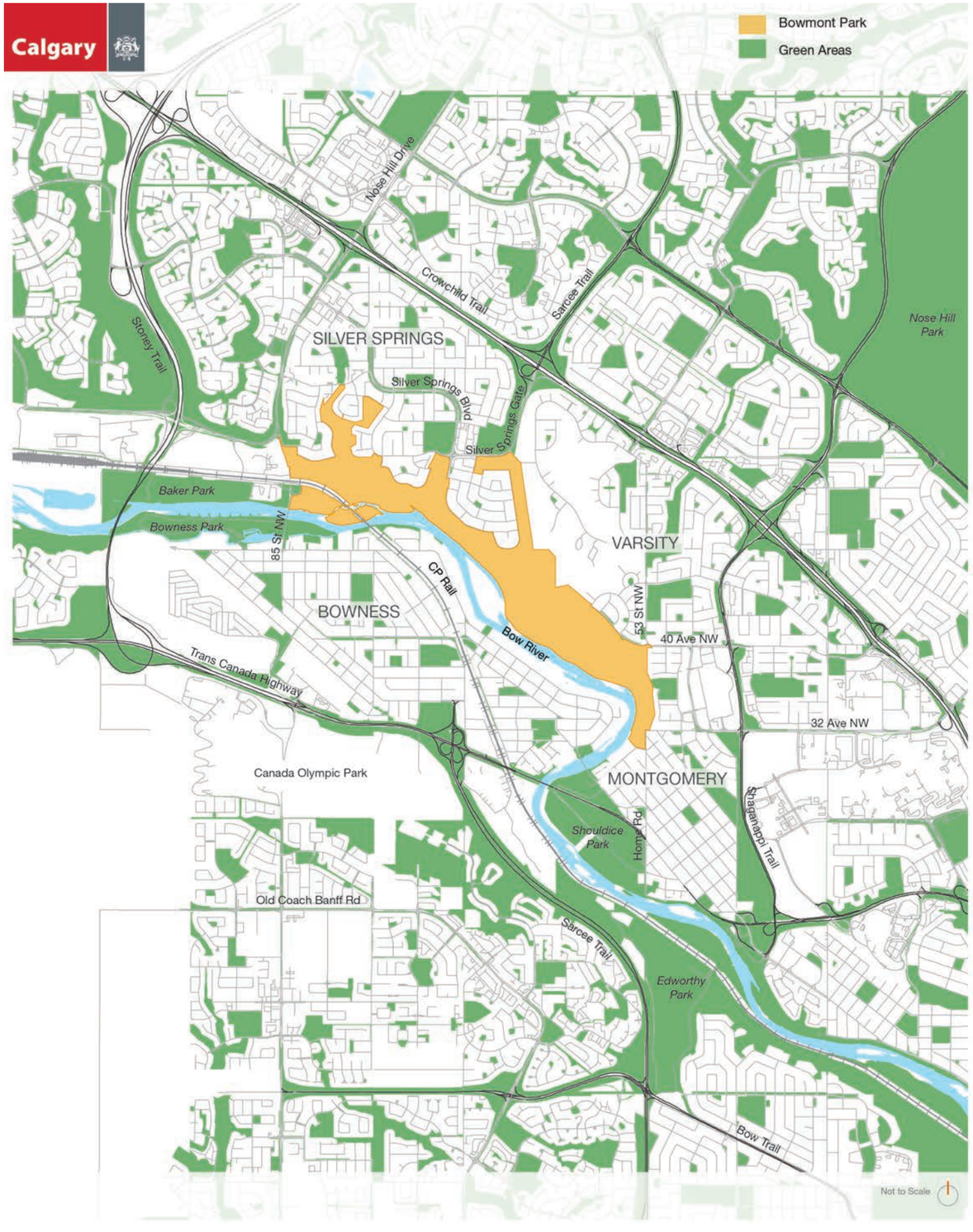
- **Phase 3** provided finalized management recommendations and an off-leash area concept built into a final updated Bowmont NEP Management Plan. This phase involved a public information session focused on off-leash options and improvements for the park.

- A summary of engagement findings for all three phases of the project can be found in the What We Heard Report under a separate cover.

2 Context

This chapter provides an overview of the local context of Bowmont NEP, including descriptions of location and current uses of the park.

Relevant plans and policies that influence management of Bowmont NEP are also presented, as well as an overview of the City's natural environment park classification system.



2.1 Location

Bowmont NEP is located on the north bank of the Bow River in the northwest part of Calgary. The park is situated within the area bounded by Stoney Trail NW to the west, Crowchild Trail to the north and 16th Avenue/TransCanada Highway to the south and southeast (Map 1). It consists of a long narrow strip of land extending for about four kilometres from 85th Street NW at the west end to Home Road to the east. It is bordered on the north by the communities of Varsity and Silver Spring, and on the south side by the Bow River and the communities of Bowness and Montgomery. The main line of the Canadian Pacific Railway cuts across the west portion of the park, parallel to the river.

The entire park occupies approximately 192 hectares, which encompasses a great diversity of ecosystem and habitat types. 5 hectares of this area is Crown Land adjacent to the Bow River. The park includes riparian areas and floodplain forests, open valley slopes covered with grasses and low shrubs, several treed coulees cut into the side slopes, and bluffs along the valley escarpment. Other major nearby parks include Nose Hill Park to the east, Edworthy and Shouldice Parks downstream along the river, and Bowness and Baker Parks upstream. Together, these parks form an important wildlife corridor in the Bow River Valley.

The main entrances to the park are accessible from 85th Street NW, Silver Springs Boulevard NW, Silver Springs Gate NW, and Home Road NW. Pedestrians and cyclists can access the park from the surrounding communities via local neighbourhood streets. Bowmont can be also be accessed by the Calgary transit system. At the top of the escarpment, there are two transit Route 137 bus stops and one transit Route 9 bus stop, which has direct pathway access to the Bowmont NEP trail system. Bus Routes 143, 407, and 40 also service the area within a few blocks of the park.

MAP 1. LOCATION

2.2 Park Uses

Bowmont NEP supports a wide range of amenities and recreational uses, such as:

- Recreational trails and pathways, including regional pathways, paved trails, nature trails, interpretive trails, and single track mountain biking trails
- Passive use, such as bird watching, lookout points, and picnic sites
- Off leash dog areas, including fenced and unfenced areas designated for off-leash use
- Two playgrounds and sports fields (although the sports fields are not managed as part of the park)
- River access points where park users can access the river bank for swimming or fishing

2.3 Relevant Plans and Policies

The Bowmont NEP Management Plan builds upon previous planning by the City of Calgary and is informed by a number of studies and biophysical assessments conducted specifically for the park. The management recommendations in this plan align with and contribute to achieving the direction set forth in City of Calgary plans for parks and natural areas. Table 1 illustrates the hierarchy of the existing plans and studies influencing Bowmont NEP.

TABLE 1. PLANS HIERARCHY

City wide; overall plan for natural areas, parks and open space	Municipal Development Plan (2009)
City wide; overall plans for open space	Open Space Plan (2003) BiodiverCity Strategic Plan (2014)
City wide; specific to river valleys	Urban Park Master Plan (1994)
City wide; specific to natural area parks	Natural Area Management Plan (1994)
City wide; specific to an aspect of open space	Off-Leash Area Management Plan (2010) Wetland Conservation Plan (2004) Integrated Pest Management Plan (1997)
Bowmont NEP specific plans	Bowmont Natural Environment Park Management Plan
Bowmont NEP specific studies	Bowmont NEP Off-Leash Dog Pilot Project: Baseline Biophysical Inventory (2005) Bowmont NEP Biophysical Impact Assessment and Restoration Plan (2007) Bowmont NEP Off-Leash Study: Issues, Options, and Recommendations (2009) Rare Vascular Plant and Ecological Community Survey for Bowmont NEP (2012) East Bowmont NEP Scoped Biophysical Impact Assessment (2012)

2.4 Natural Environment Park Classification

Calgary's Natural Area Management Plan (1994) (NAMP) defines a Natural Environment Park as "a City-owned park, classified as MR and/or ER, where the primary role is the protection of an undisturbed or relatively undisturbed area of land or water, or both, and which has existing characteristics of a natural/native plant or animal community and/or portions of a natural ecological and geographic system."

The long-term viability of natural areas is sometimes threatened by their use for intensive recreational purposes. To address this, the NAMP categorizes Natural Environment Parks into four classes to highlight different characteristics and management needs. The goal of this categorization is to ensure appropriate management practices for different types of natural area parks based on an evaluation of criteria (Table 2). Bowmont NEP is classified as a Major Natural Area, indicating that it has city-wide significance, moderate to high environmental sensitivity, and is in good natural condition. Management recommendations included in this plan are designed to sustain and enhance those characteristics.

TABLE 2. NATURAL ENVIRONMENT PARK CATEGORIES
(Calgary Natural Area Management Plan, 1994)

Criteria		Special Protection Status	Major Natural Area	Supporting Natural Area	Other Parks with Natural Areas
Overall Environmental Sensitivity	Overall sensitivity to disturbance of the majority of the habitat types found within the specific park area	High	High to Moderate	Low to Moderate	Varies
Significance	Relative importance of the overall natural system within the province or the municipality based on a simple assessment	Provincial/Regional	City-wide	Local and/or supportive	Varies
Wildlife Habitat	Average natural condition of a park area	Highly Productive and Suitable	Varying Productivity	Mostly Lower – due to size, condition, etc.	Varies
Primary Zones	Dominant management zone within a park area	Preservation	Natural Environment	Variable	Preservation, Natural Environment
Percentage of Natural Environment	Percentage of land that contains natural environment	>75%	>50%	N/A	N/A
Natural Condition of Environmental Area	Average condition of the natural environment area	Majority High	Majority High	Variable	Medium to High
Park Class	Park classification to be applied	Natural Environment Park	Natural Environment Park	Natural Environment Park	Other

3 Biophysical Inventory and Assessment

This chapter provides an overview of the existing biophysical conditions of Bowmont NEP, as well as a summary of the archaeological and historical resources present in the park.

3.1 Geology, Landforms, and Soils

The following section describes the geology, landforms, and soils that characterize Bowmont NEP.

GEOLOGY AND LANDFORMS

The bedrock underlying Bowmont NEP originates from the Palaeocene time period and is known as the Porcupine Hills Formation. This formation was laid down over 60 million years ago when the land was flat and the climate was tropical. With the retreat of the Laurentide Ice Sheet, which covered most of central and northern Canada, the site was inundated by a glacial lake (Figure 1). Glacial Lake Calgary filled much of the Bow River Valley as far west as Morley. As the Bow River wound its way through the Calgary area, it cut deep valleys and cliffs into the loose, fine grained sediments deposited by Glacial Lake Calgary. This process resulted in the landforms that characterize Bowmont NEP today: steep escarpments, sandstone outcroppings, ravines, floodplains, and river islands. Much of the escarpment visible in Bowmont NEP is comprised of these ancient lakebed sediments. The bluff edge exposes lacustrine silts which hint at the geologic legacy of Glacial Lake Calgary (Figure 2).

Pleistocene gravel can be found in the park, which has been associated with fossil vertebrates. Bentonitic clays also exist in the area, but are very limited in extent. Tufa or calcium carbonate deposits are exposed as a result of active springs at the west end of Waterfall Valley. These recent deposits are unique in Calgary and constitute one of the most unique biophysical elements of the park. These deposits are very sensitive to disturbance and have the potential to provide shelter for rare plants (Moran, 1986).

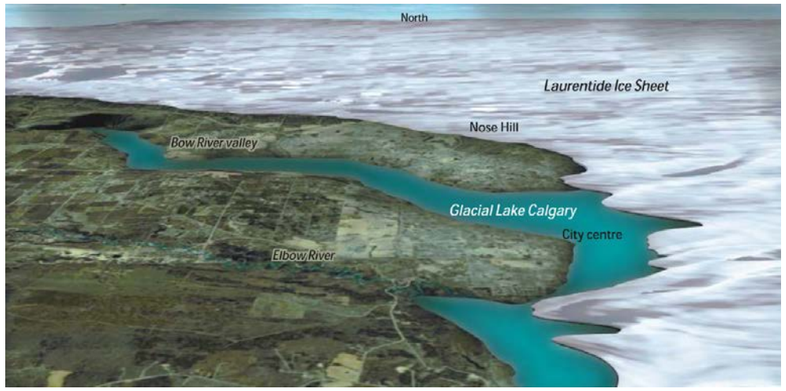


FIGURE 1. DIGITAL RENDERING OF THE LAURENTIDE ICE SHEET ON TODAY'S LANDSCAPE
(Terry Poulton, GSC)

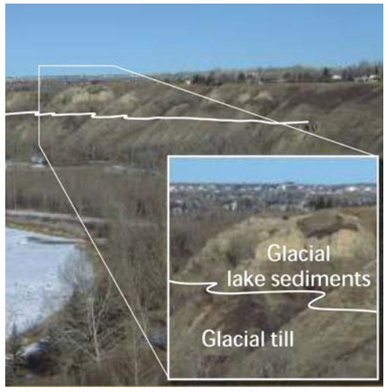
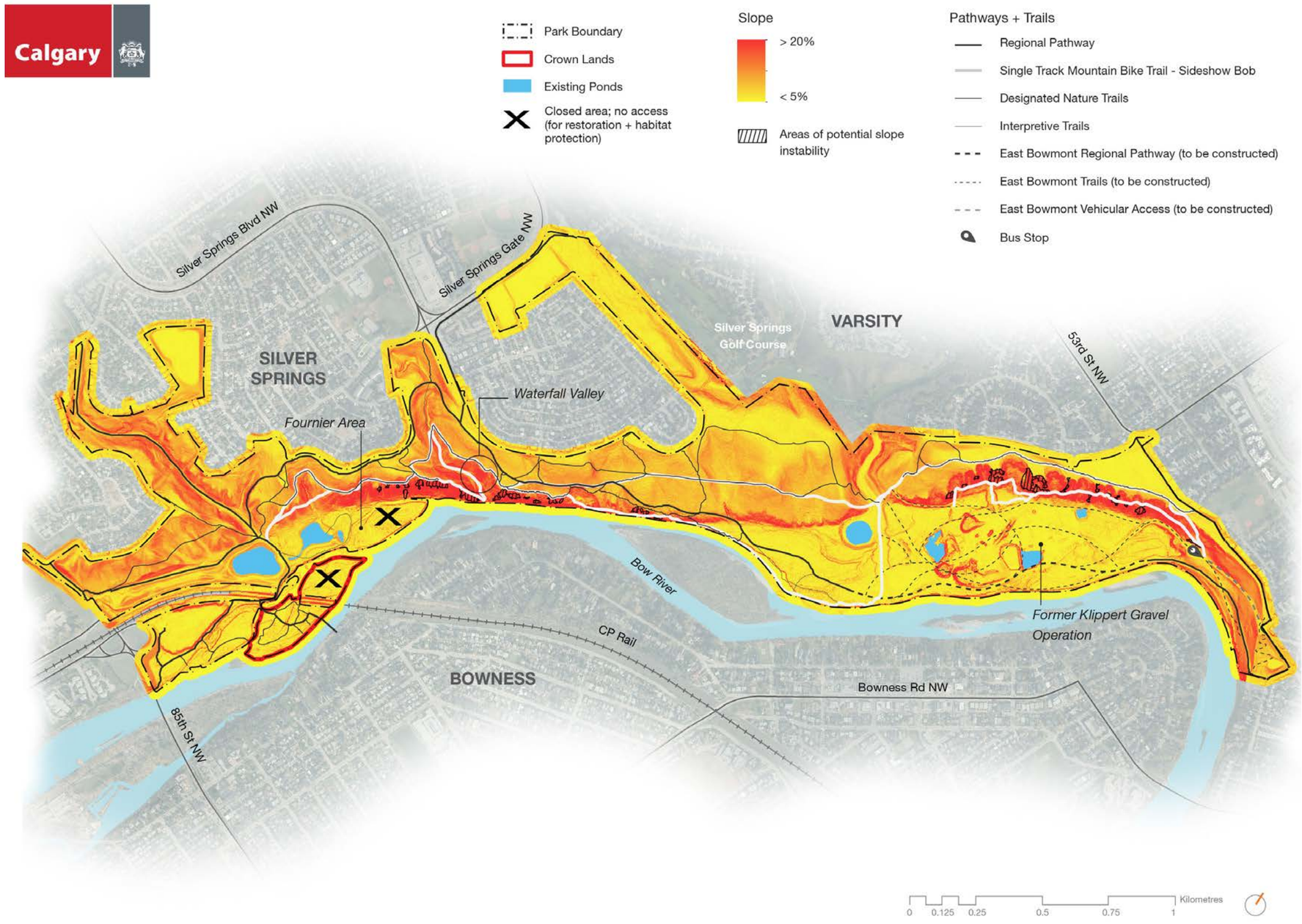


FIGURE 2. LAKE SEDIMENTS DEPOSITED BY GLACIAL LAKE CALGARY
(Terry Poulton, GSC)

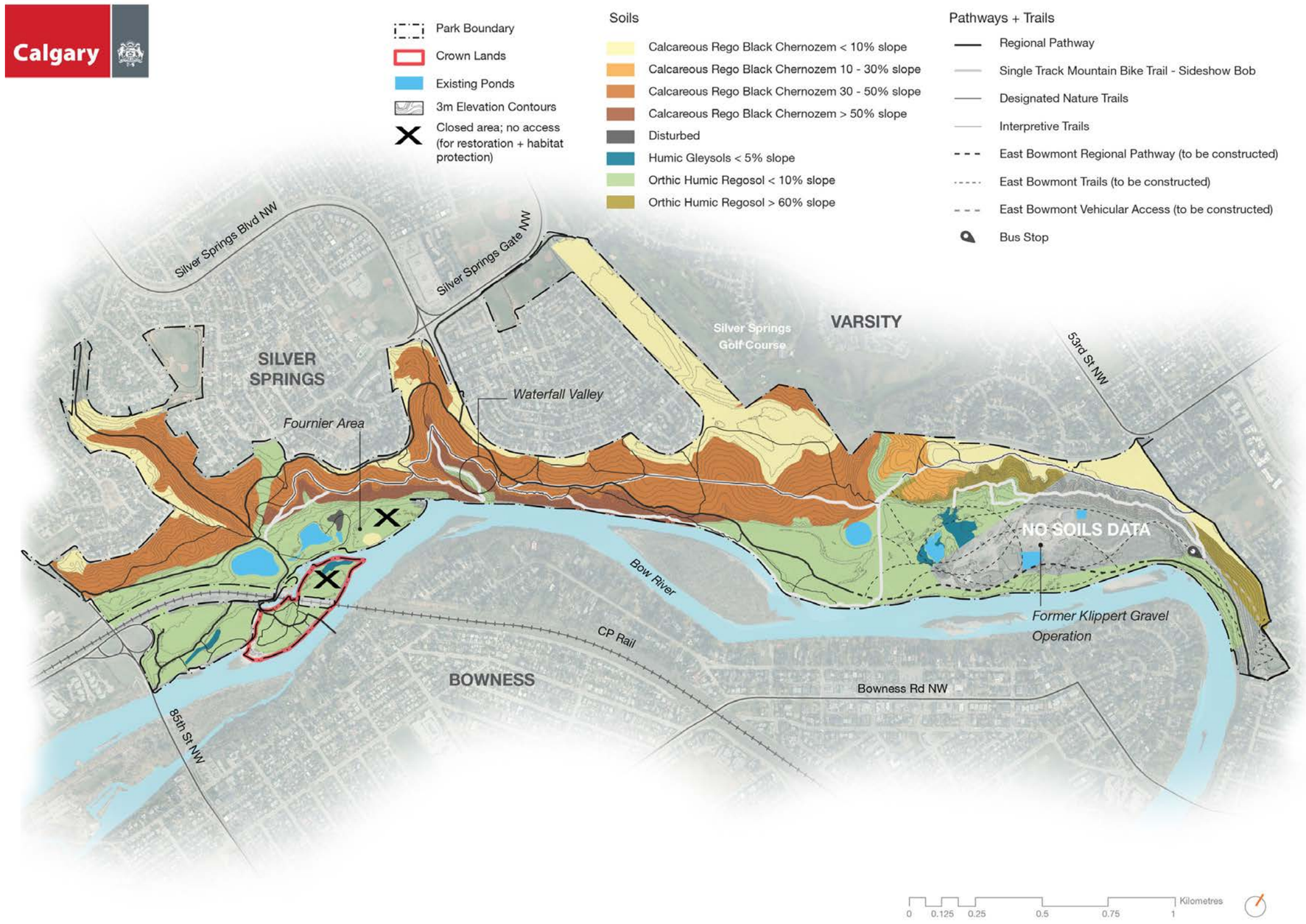
SLOPES AND SOILS

In general, Bowmont NEP slopes from north to south towards the Bow River. The flat lands at the top of the park are separated from the floodplain below by a 50 metre high escarpment. Slopes in Bowmont NEP are generally greater than 15%, but in some places are much more extreme (City of Calgary, 2004). The escarpment, which dominates a large portion of the eastern end of the park, is comprised of slopes of about 100%, or 45 degrees, with isolated areas approaching 150% (Map 2). In part owing to the steepness of the slopes, and in part due to their make-up of soft lacustrine silts, the escarpment slopes are very prone to erosion. Slopes surrounding Waterfall Valley are slightly less steep, more heavily vegetated, and therefore less prone to erosion. The floodplain areas are flat and gently sloping.

Dominant soils in Bowmont NEP are Black Chernozems with topsoil depths of less than 15 centimetres (Golder Associates, 2007). Regosolic soils are also present (Map 3). The soils and groundwater within the former Klippert gravel pit contain hydrocarbons and metals that exceed the provincial tolerances for residential/parkland land uses (Jacques Whitford Ltd., 2004). With the construction of the East Bowmont Stormwater Quality Control elements, these areas will be reclaimed using phytoremediation techniques (O2 Planning + Design, Inc., 2014).



MAP 2. SLOPES



3.2 Archaeological and Historical Resources

This section provides an overview of the human use of the Bowmont area from pre-contact to modern times, and includes a summary of the archaeological and historical resources found in the park today.

ARCHAEOLOGICAL RESOURCES

The occupation of Bowmont Park by the First Nations peoples likely began at the end of the last Ice Age, approximately 10,000-14,000 years ago (Vivian, 2015). There are 13 known sites of historical record within the park boundaries (Map 4). Several of these are small artifact scatters, while other sites are the remnants of larger campsites, and two tipi ring sites are evident but no longer intact. Individually these sites are not highly significant, but as a group they describe the pattern of local land use in pre-contact times, providing interpretive value and insight into the area (Vivian, 2015). Around 1994, intense media attention and academic controversy were brought to the park with the discovery of crudely worked “stone tools” that were claimed to be evidence of the earliest pre-Clovis human occupations in North America (Chlachula 1994a, 1994b, and 1996). These claims have since been refuted (Young et al. 1998).

Following the 2013 flood, a detailed Historic Resources Impact Assessment (HRIA) was completed as part of a more extensive survey of flood affected landforms along the Bow River, funded by Alberta Culture and Tourism. This HRIA confirmed that the main terrace extending through Bowmont NEP is a geologically recent landform, and therefore holds limited potential for deeply buried cultural materials (Vivian and Amundsen-Meyer 2015). As a result, no pre-contact sites have been reported for the lower valley regions within the Park. However, immediately downstream of Bowmont Park, an ancient bison skull was recovered from a cutbank exposure below Home Road. The skull was radiocarbon dated to 10,840 +/- 50 radiocarbon years before present (rcybp) (Beta-372155), indicating that the bison skull is associated with the very early post-glacial period.

MAP 3. SOILS

HISTORICAL RESOURCES

In 1913, the rancher and philanthropist James Shouldice built a 25-room mansion overlooking the Bow River at the south end of what is now East Bowmont NEP (Figure 5). The home was converted to a crematorium in 1937 and was demolished in 1974. The area is still sometimes referred to as “Crematorium Hill”. Remnants of the hedgerow that once enclosed the south and west sides of the house still exist in the park (Map 4).

In recent history, East Bowmont NEP was used as a privately owned and operated gravel quarry. Mining on the site started around 1949. The land was purchased by Klippert Gravel and Sand Ltd. in 1964 and was acquired by the City of Calgary for incorporation into Bowmont NEP in 2011.

FIGURE 3. SHOULDICE HOUSE CIRCA 1950
(Glenbow Museum Archives)

Calgary

Park Boundary
Crown Lands
Existing Ponds
3m Elevation Contours
Closed area; no access (for restoration + habitat protection)
Areas of potential slope instability

Archaeological + Historical Resources Sites
Previously Recorded Historical Resources Sites
Site of the former Shouldice Mansion

Pathways + Trails
Regional Pathway
Single Track Mountain Bike Trail - Sideshow Bob
Designated Nature Trails
Interpretive Trails
East Bowmont Regional Pathway (to be constructed)
East Bowmont Trails (to be constructed)
East Bowmont Vehicular Access (to be constructed)
Bus Stop

Silver Springs Blvd NW
Silver Springs Gate NW
SILVER SPRINGS
Fournier Area
Waterfall Valley
Silver Springs Golf Course
VARSITY
53rd St NW
Bow River
CP Rail
BOWNESS
Former Klippert Gravel Operation
Site of the former Shouldice Mansion
Bowness Rd NW
85th St NW

0 0.125 0.25 0.5 0.75 1 Kilometres

MAP 4. ARCHAEOLOGICAL AND HISTORICAL RESOURCES

MAP 5. HYDROGRAPHY

3.3 Water Resources and Wetlands

Water resources and stormwater infrastructure within Bowmont NEP are managed by Calgary Water Resources – not Calgary Parks. Therefore, this section is solely intended to contribute to an understanding of the biophysical context of the park.

HYDROGRAPHY

Kerr Wood Leidal Consulting Engineers conducted a drainage assessment as part of the Bowmont NEP Management Plan Update in 2015. This study highlighted the importance of certain drainage features on the landscape. There are three large coulees interspersed along the escarpment edge, characterized by scallop shaped drainage pathways. Surface runoff accumulates in these features and flows down the escarpment to the Bow River floodplain below. Overland drainage patterns follow this trend since the vast majority of the park is not serviced by stormwater collection and conveyance facilities (Kerr Wood Leidal, 2015). Drainage patterns in Bowmont NEP are illustrated in Map 5.

STORMWATER INFRASTRUCTURE

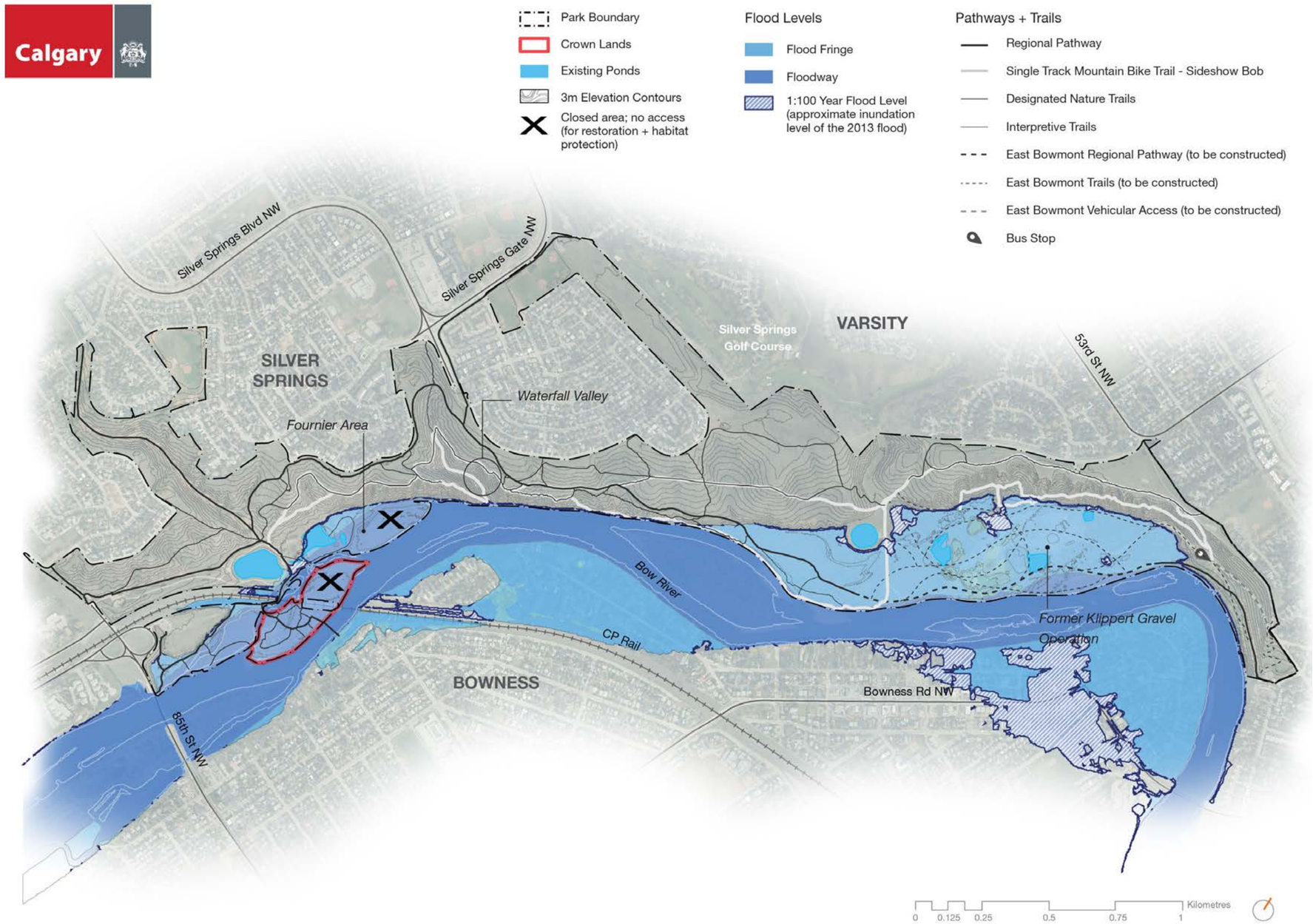
In the former Klippert gravel pit area, three ponds appear to be remnant depressions from the former gravel mining operation. The East Bowmont Stormwater Quality Control and Natural Environment Park Project will change the existing conditions of these depressions to a wet pond, subsurface and infiltration wetlands, and natural channels. The former ponds, the West Bowmont Wet Ponds (which are already part of a stormwater quality control system), and the small pond located on the former Fournier property will be incorporated into the park's stormwater infrastructure.

FLOOD IMPACTS

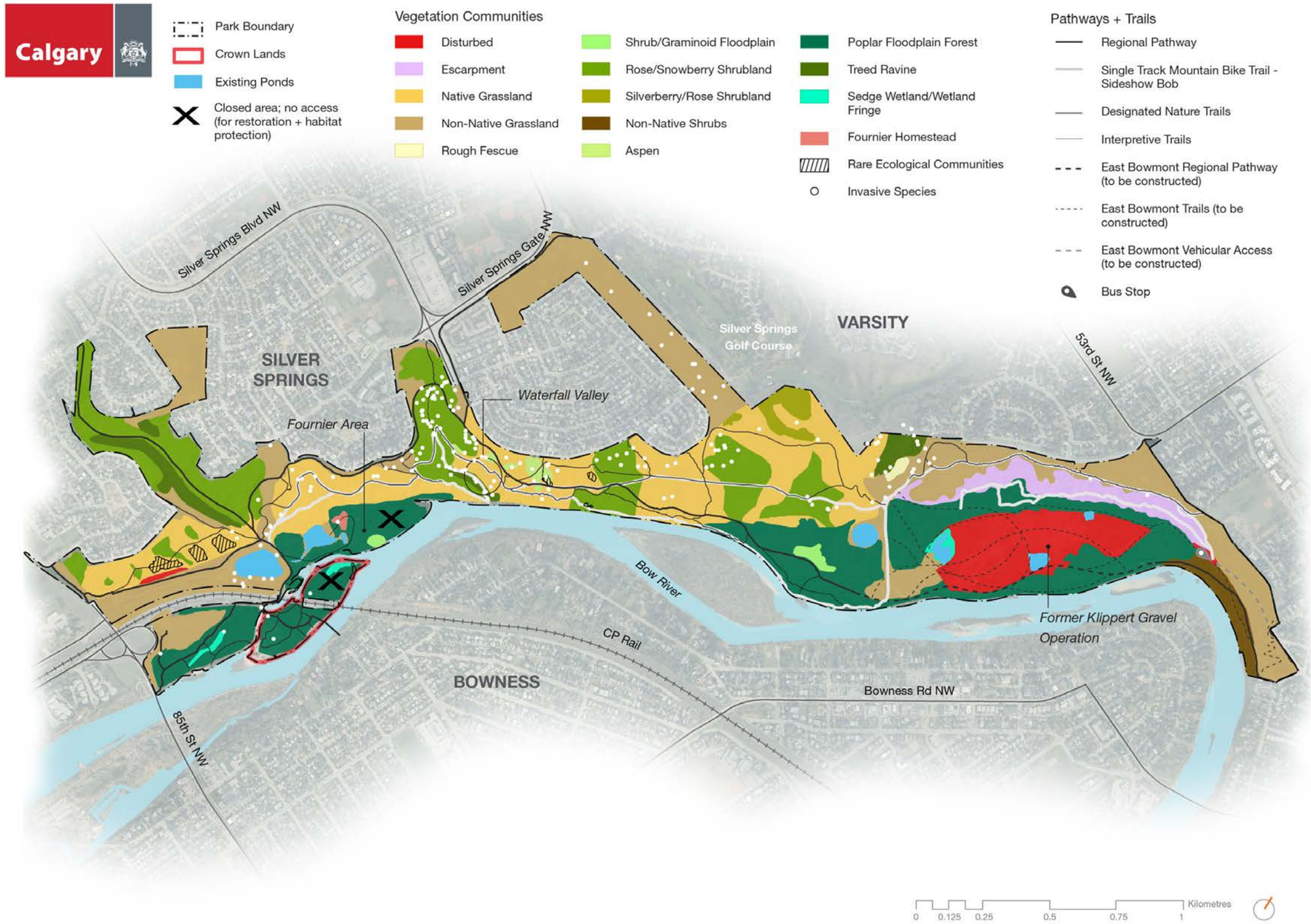
Flooding due to high water levels in the Bow River only affects the lower areas of the park. Some areas of the park are located within the floodway and flood fringe (Map 6). In general, where there are remnant floodplain terraces, such as in the east and west ends of the park, flooding is observed during the 1:100 year event. These areas are subject to the deepest, fastest and most destructive flows. Areas in the flood fringe have flood flows that are generally shallower and slower than in the floodway. The majority of the East Bowmont NEP is located in the flood fringe.

WETLANDS

There are two sedge wetlands located in the western floodplain of the park, close to the river within the floodplain forest. These sedge wetlands are relatively small, moderately wet areas which may dry up in the summer. The dominant plant community is comprised of water sedge (*Carex aquatilis*), beaked sedge (*Carex utriculata*), narrowspike reedgrass (*Calamagrostis stricta*), and tufted hairgrass (*Deschampsia caespitosa*). Willows and rushes are also present in these communities. In addition to these wetlands, a number of man-made wetlands and marshes are to be constructed in the former Klippert gravel pit as part of the East Bowmont Stormwater Quality Control and Natural Environment Park Project (O2 Planning + Design, Inc., 2014).



MAP 6. BOW RIVER FLOOD LEVELS



MAP 7. VEGETATION COMMUNITIES

3.4 Vegetation Communities

This section provides an overview of the vegetation communities present in Bowmont NEP, including tree communities, riparian communities, grassland and shrubland communities, as well as rare and invasive plant species found within the park. Distribution of the dominant vegetation communities and rare ecological communities in Bowmont NEP is illustrated in Map 7. The locations of invasive weeds in the park are illustrated in Map 8.

3.4.1 TREE COMMUNITIES

Poplar Floodplain Forest

The poplar floodplain forest community type covers a large area of the floodplain in Bowmont NEP. The dominant tree species in this community type is balsam poplar (*Populus balsamifera*) with the understory being comprised of a variety of other shrub species such as redosier dogwood (*Cornus sericea*), Saskatoon serviceberry (*Amelanchier alnifolia*), silverberry (*Eleagnus commutate*), buffaloberry (*Shepherdia canadensis*), shrubby cinquefoil (*Dasiphora floribunda*), woods rose (*Rosa woodsii*), and snowberry (*Symphoricarpos albus*). The forest also contains willow communities, forbs, and a mix of native and non-native grass species. In some areas of the poplar floodplain, the understory is being taken over by invasive non-native shrubs such as Siberian peashrub (*Caragana arborescens*), Tatarian honeysuckle (*Lonicera tatarica*) and cotoneaster (*Cotoneaster salicifolius*). Invasion by these non-native species is a threat to the community, and if left unchecked, could significantly decrease both the species richness and native species cover in this community.

Treed Ravine

The treed ravine community is dominated by woody species such as redosier dogwood (*Cornus sericea*) and balsam poplar (*Populus balsamifera*). This is a very dense community with a closed canopy in certain areas. Due to the density of the shrubs and trees, there is low human traffic through this area.

Aspen
The aspen community is dominated by trembling aspen (*Populus tremuloides*) with some balsam poplar (*Populus balsamifera*) present. Smooth brome (*Bromus inermis*) is a potential threat to this community. It typically invades the understory, pushing out most native grasses and forbs as it encroaches on the forest. Aspen communities are widely understood to expand in fescue grassland communities when fire is not present.

3.4.2 GRASSLAND COMMUNITIES

Rough Fescue
The rough fescue community is dominated by foothills rough fescue (*Festuca campestris*) and is present as a small remnant patch of fescue grassland. There are also shrubs naturally found within these grasslands, as well as dominant forbs. Rough fescue grasslands are very fragile communities and will require management in order to maintain them within the park. The greatest threats to this grassland are human traffic, forest encroachment, and invasive non-native species such as Kentucky bluegrass (*Poa pratensis*) and smooth brome (*Bromus inermis*).

Other Native Grassland
Other native grassland species are found in the valley bottom. These areas are dominated by grazing-tolerant native grass species such as western wheatgrass (*Agropyron smithii*) and northern wheatgrass (*Agropyron dasystachyum*). Two rare ecological communities are found in the area, on the escarpment slopes and in the drier environments of the park: needle-and-thread grass (*Stipa comata*) and sand grass (*Calamovilfa longifolia*). The most significant threats to these communities are invasive species (smooth brome and Kentucky bluegrass), forest encroachment, informal trail creation, and off-leash dogs.

Non-Native Grassland
Non-native grassland communities in the park are primarily dominated by smooth brome (*Bromus inermus*), Kentucky bluegrass (*Poa pratensis*), and crested wheatgrass (*Agropyron cristatum*). Other species found in these grasslands include alfalfa (*Medicago sativa*), clover (*Melilotus sp.*) and dandelion (*Taraxacum officinale*). Smooth brome (*Bromus inermus*) and Kentucky bluegrass (*Poa pratensis*) are a threat to neighbouring native communities as they frequently invade these communities and suppress or eliminate native species. Most of the areas currently maintained as mowed turf are non-native grasslands and should be maintained as such. Regular mowing of these areas is needed to prevent the spread of seed from these areas to surrounding native areas.

3.4.3 SHRUB COMMUNITIES

Rose/Snowberry Shrubland
The rose/snowberry shrubland community covers a relatively large area of Bowmont NEP. These communities are located in southwest-facing basins extending from the floodplains to the uplands. Dominant species include snowberry (*Symphoricarpus occidentalis*) and rose (*Rosa sp*), with other native grasses and forbs also present.

Silverberry/Rose Shrubland
The silverberry/rose shrubland community is present within some of the native grasslands in the park. The dominant species in this community is silverberry (*Elaeagnus commutate*) but rose (*Rosa sp.*) and snowberry (*Symphoricarpus occidentalis*) are also very abundant. These communities have been kept in balance by wildlife, but are slowly expanding throughout the park.

Non-Native Shrub Communities
Non-native shrub communities are mainly located along the regional pathway. These areas were planted with ornamental non-native shrub species such as Siberian peashrub (*Caragana arborescens*), which dominates these areas, resulting in a significant loss of species diversity. Typically, the understory of these areas consists of invasive grasses.

Shrub/Graminoid Floodplain
The shrub/graminoid floodplain communities are located on the floodplain and are composed of both shrub and graminoid-dominated communities. California oatgrass (*Danthonia californica*) and junegrass (*Koeleria macrantha*) are dominant in this community, with aspen (*Populus tremuloides*), bearberry (*Arctostaphylos uva-ursi*), and shrubby cinquefoil (*Dasiphora floribunda*) throughout. These areas experience high human traffic as evidenced by the well-used informal trails.

3.4.4 ESCARPMENT COMMUNITIES

The escarpments are characterized by steep slopes and areas of exposed soil which are prone to erosion and slumping. The vegetation communities of the escarpment are comprised of northern wheatgrass (*Agropyron dasystachum*), sand grass (*Calamovilfa longifolia*), western wheatgrass (*Agropyron smithii*), green needle grass (*Stipa viridula*), Saskatoon serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpus occidentalis*) and rose (*Rosa woodsii*). Several forbs are also present. A single track mountain bike trail cross-cuts the escarpment, and several informal trails run perpendicular to the slope. These informal trails pose the greatest threat to the fragile escarpment communities, as they are more likely to be disturbed by erosion. Erosion increases the likelihood of invasion by non-native species.

TABLE 3. NOXIOUS WEEDS FOUND IN BOWMONT NEP

Common Name	Scientific Name	Status
Creeping Bellflower	*Campanula rapunculoides*	noxious
Tall Buttercup	*Ranunculus acris*	noxious
Scentless Chamomile	*Tripleurospermum inodorum*	noxious
Yellow Clematis	*Clematis tangutica*	noxious
Oxeye Daisy	*Leucanthemum vulgare*	noxious
Dame's Rocket	*Hesperis matronalis*	noxious
Black Henbane	*Hyoscyamus niger*	noxious
Hound's Tongue	*Cynoglossum officinale*	noxious
Perennial Sow Thistle	*Sonchus arvensis*	noxious
Common Tansy	*Tanacetum vulgare*	noxious
Canada Thistle	*Cirsium arvense*	noxious
Common Toadflax	*Linaria vulgaris*	noxious

3.4.5 INVASIVE SPECIES

Invasive species are found throughout the park. The most widespread invasive species are Kentucky bluegrass (*Poa pratensis*) and smooth brome (*Bromus inermis*). These two species are largely responsible for pushing native species out of the park.

Escaped ornamental species, including numerous shrubs, are the next most common group of invasive species in the park. These species are typically not listed under the Weed Control Act (2008) and are therefore not the focus of weed control. Nonetheless, they are capable of causing significant ecological damage if left unmanaged.

Lastly, several regulated noxious weeds are found within the park. These weeds can threaten the ecological stability of the park and should be controlled according to the guidelines of the Calgary Integrated Pest Management Plan (1997) for noxious weeds. Many of these noxious weeds are found in the former Klippert gravel pit area, but some are spread throughout the river valley. A full list of the noxious weeds currently found in Bowmont NEP is outlined in Table 3. Locations of invasive weed species in the park are illustrated in Map 8.

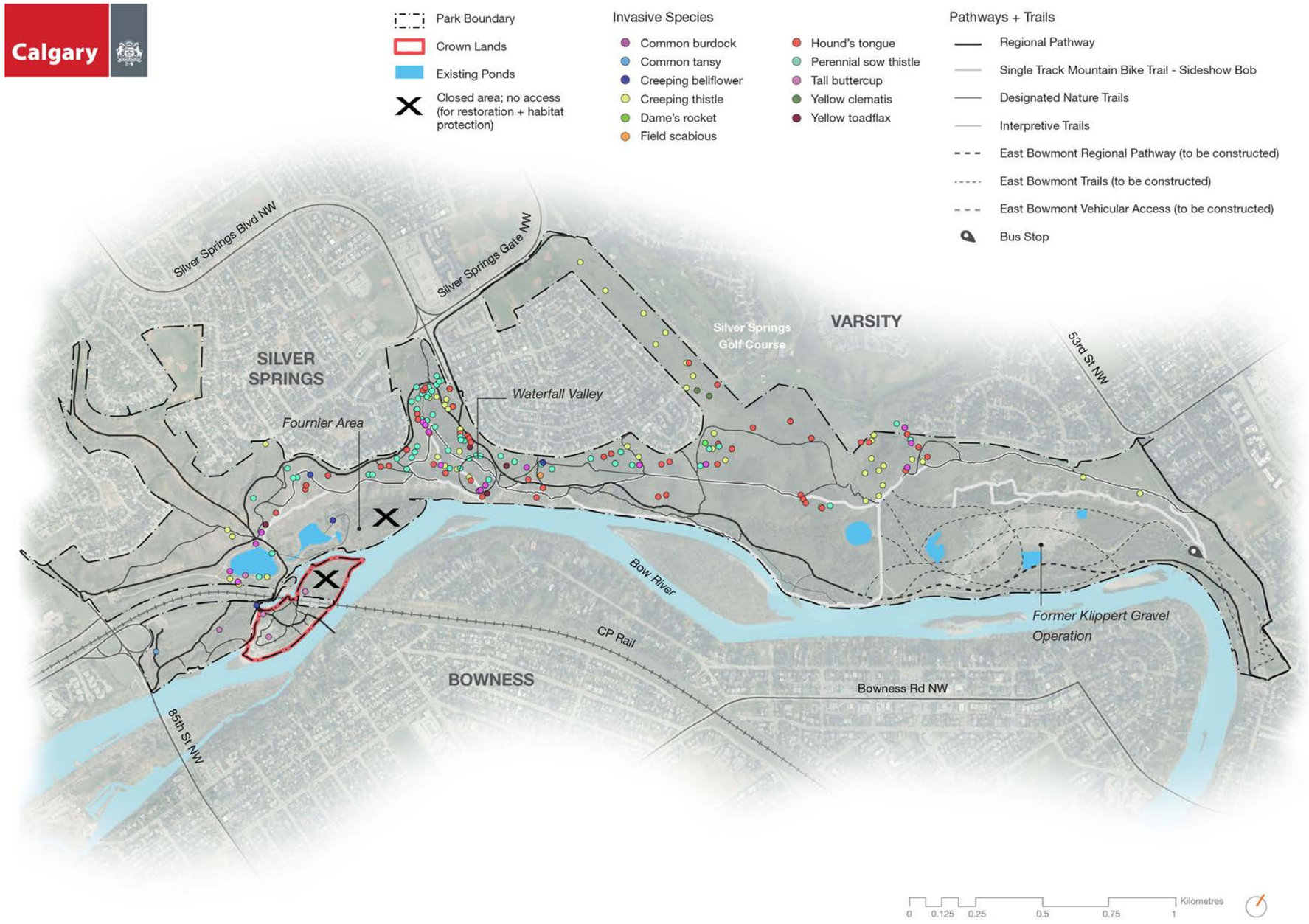
3.4.6 RARE PLANTS AND RARE ECOLOGICAL COMMUNITIES

Rare Vascular Plants
In 2007, a query of the Alberta Natural Heritage Information Centre database (now known as the Alberta Conservation Information Management System, ACIMS) indicated six occurrences of rare bryophytes (*Bryum algovicum*, *Didymodon fallax*, *Grimmia donniana*, *Orthotrichum affine*, *Seligeria campylopoda*, and *Weissia controversa*), one rare lichen (*Chaenotheca chrysocephala*), and two rare vascular plants (*Iris missouriensis*, *Sisyrinchium septentrionale*) in the Bowmont Park area (Golder Associates, 2007). At the time, a rare plant survey was not conducted. A later rare vascular plant survey conducted in 2012 by Zanshin Environmental Networks Inc. was unable to confirm these occurrences within Bowmont NEP (Zanshin Environmental Networks Inc., 2012), although an additional ACIMS entry was noted for mountain lady's slipper (*Cypridedium montanum*). A rare plant survey of East Bowmont Park conducted in 2012 by

O2 Planning and Design also did not find any rare plants within the survey area (O2 Planning + Design Inc, 2012).

Rare Ecological Communities

The Zanshin Environmental Networks 2012 study observed two rare ecological communities within the park: water birch grassland riparian shrubland (*Betula occidentalis*) and sand grass – needle-and-thread grassland (*Calamovilfa longifolia – Stipa comata*). The locations of these communities are illustrated on Map 7. The water birch grassland riparian shrubland community was ranked in between 'Imperiled' and 'Vulnerable' at the time of the 2012 survey. The dominant shrub layer is comprised of water birch (*Betula occidentalis*) with smaller components of aspen (*Populus tremuloides*), Bebb's willow (*Salix bebbiana*), redosier dogwood (*Cornus sericea*), shrubby cinquefoil (*Potentilla fruticosa*), Saskatoon serviceberry (*Amelanchier alnifolia*) and cotoneaster (*Cotoneaster salicifolius*). The understory consists of star-flowered Solomon's seal (*Maianthemum stellatum*), northern bedstraw (*Galium boreale*) and Kentucky bluegrass (*Poa pratensis*). The sand grass – needle-and-thread grassland community was provincially ranked as 'Vulnerable' at the time of the 2012 survey. The community had two co-dominant grasses: sand grass (*Calamovilfa longifolia*) and needle-and-thread grass (*Stipa comata*), with other grasses such as green needle grass (*Stipa viridula*) and blue grama grass (*Bouteloua gracilis*) also present. Forbs present included dotted blazing star (*Liatris punctata*), northern bedstraw (*Galium boreale*), star-flowered Solomon's seal (*Maianthemum stellatum*) and goldenrod (*Solidago sp*) (Zanshin Environmental Networks, 2012).



MAP 8. INVASIVE SPECIES

3.5 Wildlife and Habitats

This section describes the wildlife and habitats in Bowmont NEP, including mammals, birds, and fish. It also provides a summary of wildlife connectivity conditions in the park.

3.5.1 MAMMALS

Twenty-two mammal species are known to occur in the Bowmont NEP (City of Calgary 2004, G. Wagner, personal observations) (Table 4). None of these species are designated as being 'At Risk' by COSEWIC (2015). A number of bat species known to frequent the area have at-risk designations (COSEWIC 2015), but their distribution and occurrence in the park are poorly known. Most species in the park are listed as secure under the General Status of Wildlife Species 2010, with a few exceptions including the cougar, which would only occur in the park on an extremely limited basis.

TABLE 4. MAMMALS KNOWN TO OCCUR IN BOWMONT NEP

Species	General Status of Alberta Wild Species 2010
American Beaver	Secure
Bats (*Myotis sp.*)	Variable
Cougar	Sensitive
Coyote	Secure
Grey Squirrel	Exotic/Alien
Long-tailed Weasel	May Be At Risk
Mice (*Peromyscus sp.*)	N/A
Mink	Secure
Mule Deer	Secure
Muskrat	Secure
Northern Pocket Gopher	Secure
Porcupine	Secure
Red Fox	Secure
Red Squrrel	Secure
Richardson's Ground Squirrel	Secure
Short-tailed Weasel	Secure
Shrews (*Sorex sp.*)	Secure
Snowshoe Hare	Secure
Striped Skunk	Secure
Voles (*Microtus sp.*)	N/A
White-tailed Deer	Secure
White-tailed Jack Rabbit	Secure

3.5.2 BIRDS

Over two hundred bird species have been documented in Bowmont NEP (Calgary Field Naturalists Society, 1970s; Calgary Field Naturalist Society, 1987 and 2005). Twelve of these species have a COSEWIC (2015) status designation. This includes five species designated as 'Special Concern': horned grebe (*Podiceps auritus*), western grebe (*Aechmophorus occidentalis*), short-eared owl (*Asio flammeus*), peregrine falcon (*Falco peregrinus*), and rusty blackbird (*Euphagus carolinus*). Short-eared owls could potentially nest in grassland areas of Bowmont NEP. The remaining species are migrants. Seven other species have a 'Threatened' designation. These include four species that migrate through the area: Canada warbler (*Cardellina canadensis*), loggerhead shrike (*Lanius ludovicianus*), olive-sided flycatcher (*Contopus cooperi*), and ferruginous hawk (*Buteo regalis*).

Five species known to migrate through the park have 'At Risk' designations under the Alberta Wildlife Act: trumpeter swan (*Cygnus buccinator*), ferruginous hawk, peregrine falcon, loggerhead shrike, and black-throated green warbler (*Setophaga virens*). All of these species would be infrequent migrants through the park. There are concerns about the status of forty-four other bird species as outlined in the General Status of Alberta Wild Species (2010). Short-eared owl and olive-sided flycatcher are 'May Be At Risk' species. An additional eleven 'Sensitive' species are known to breed in the park, or could potentially breed in the area. The Nature Appreciation Area located in the central portion of Bowmont NEP along the river is a known breeding area for ground nesting birds.

Overall, the 2013 flood will probably have few long-term impacts on bird populations. Ample habitat remains in the park for both breeding and migrating species. On a long-term basis, the maintenance of riparian poplar forest will be of great importance to bird populations.

3.5.3 FISH

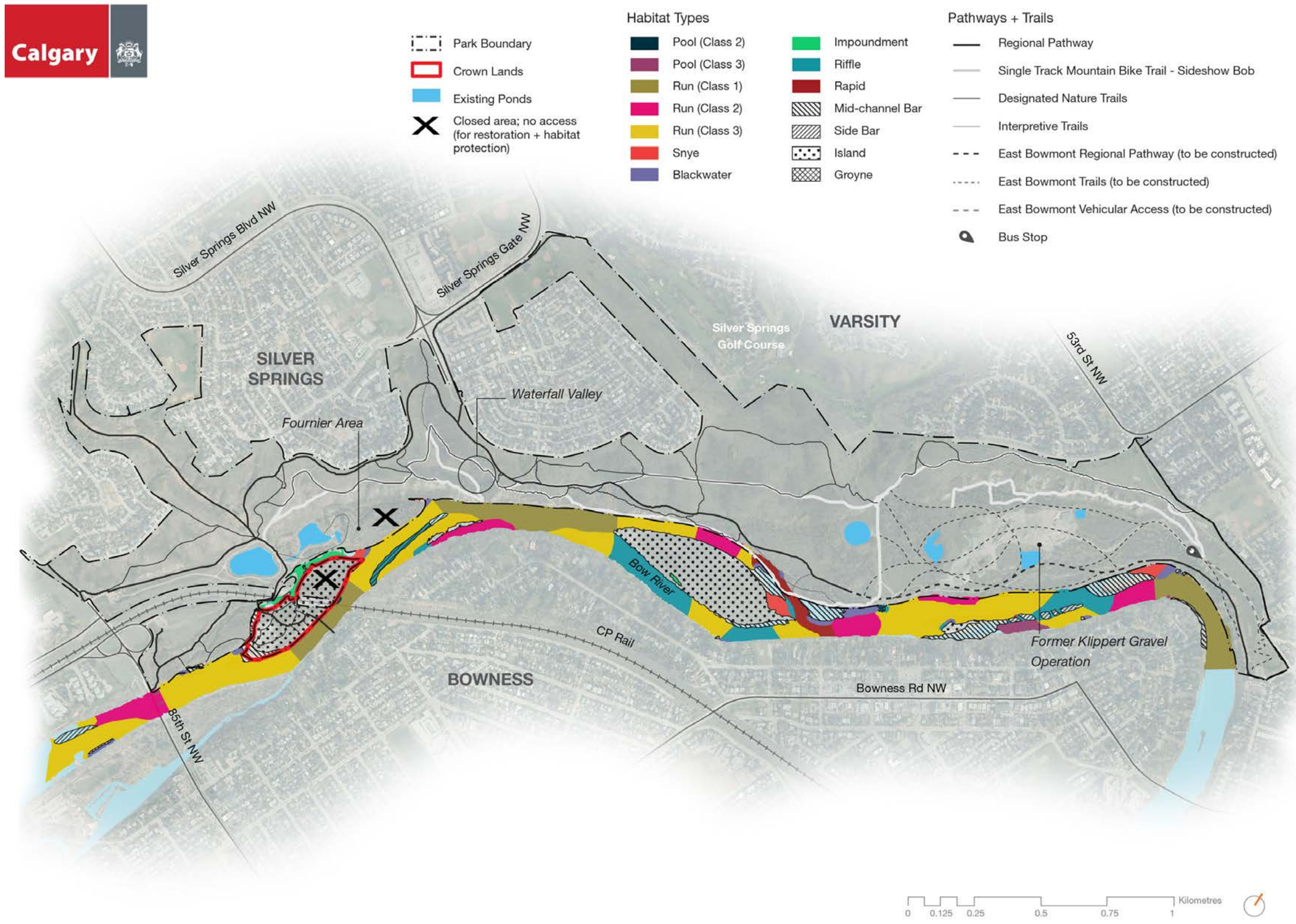
At least seventeen fish species, and perhaps as many as nineteen species, occur in the Bow River in Calgary (Nelson & Paetz, 1992). Of these, four species are introduced: rainbow trout, brown trout, brook trout, and lake whitefish.

In the fall of 2006 and winter of 2007, Fisheries and Oceans Canada observed rainbow and brown trout, mountain whitefish and burbot using spawning and rearing habitat adjacent to the Bowmont NEP. In 2015, Klohn Crippen Berger commenced the Calgary Rivers Morphology and Fish Habitat Study on behalf of the City of Calgary to determine the net change in fish habitat value caused by emergency flood repair following the 2013 flood. The first phase of the study found that proportions of various habitat types characterizing the Bow River have remained relatively consistent between previous assessments (2000/2002) and the current (2014) assessment, despite the occurrence of two major floods (Klohn Crippen Berger, 2015). The dominant habitat type found in the Bow River continues to be run habitat, with 71% reported previously (Golder 2002; Townsend 2003) and 69% identified in the current assessment. The distribution of different instream mesohabitat types following the 2013 flood are illustrated in Map 9. Descriptions of these mesohabitat types are found in Table 5.

Despite the relatively consistent proportions of mesohabitat types since the 2013 flood, large scale and widespread changes in channel morphology are evident when comparing current conditions to historical air photographs and habitat data at specific locations.

TABLE 5. AQUATIC HABITAT CLASSIFICATION FOR INSTREAM MESOHABITATS
(adapted from O'Neil and Hildebrand 1986)

Habitat Type	Description
Pool Class 1	Deepest pool habitat. High instream cover due to instream features and depth. Suitable holding water for adults and for overwintering.
Pool Class 2	Moderate depth. Shallower than class 1 pools with high-moderate instream cover except during low flow conditions. Not suitable for overwintering.
Pool Class 3	Low depth and often small in size. Low instream cover at all but high flow events.
Run Class 1	Deepest run habitat. Generally deep and slow with coarse substrate. High instream cover from substrate and/or depth.
Run Class 2	Moderate depth. High-moderate instream cover except at low flow. Generally deep and fast or moderately deep and slow.
Run Class 3	Shallowest run habitat. Low instream cover in all but high flows.
Snye	Discrete section of non-flowing water connected to a flowing channel only at one end. Generally formed in a side channel or behind a peninsula.
Backwater	Discrete, localized area of variable size exhibiting reverse flow direction, which generally produces bank irregularities. Velocities are variable but are generally lower than main flow. Substrate is similar to adjacent channel with a higher percentage of fine grained material.
Impoundment	Includes pools which are formed behind dams. Tend to accumulate sediment and organic debris, and may have cover associated with the damming structure.



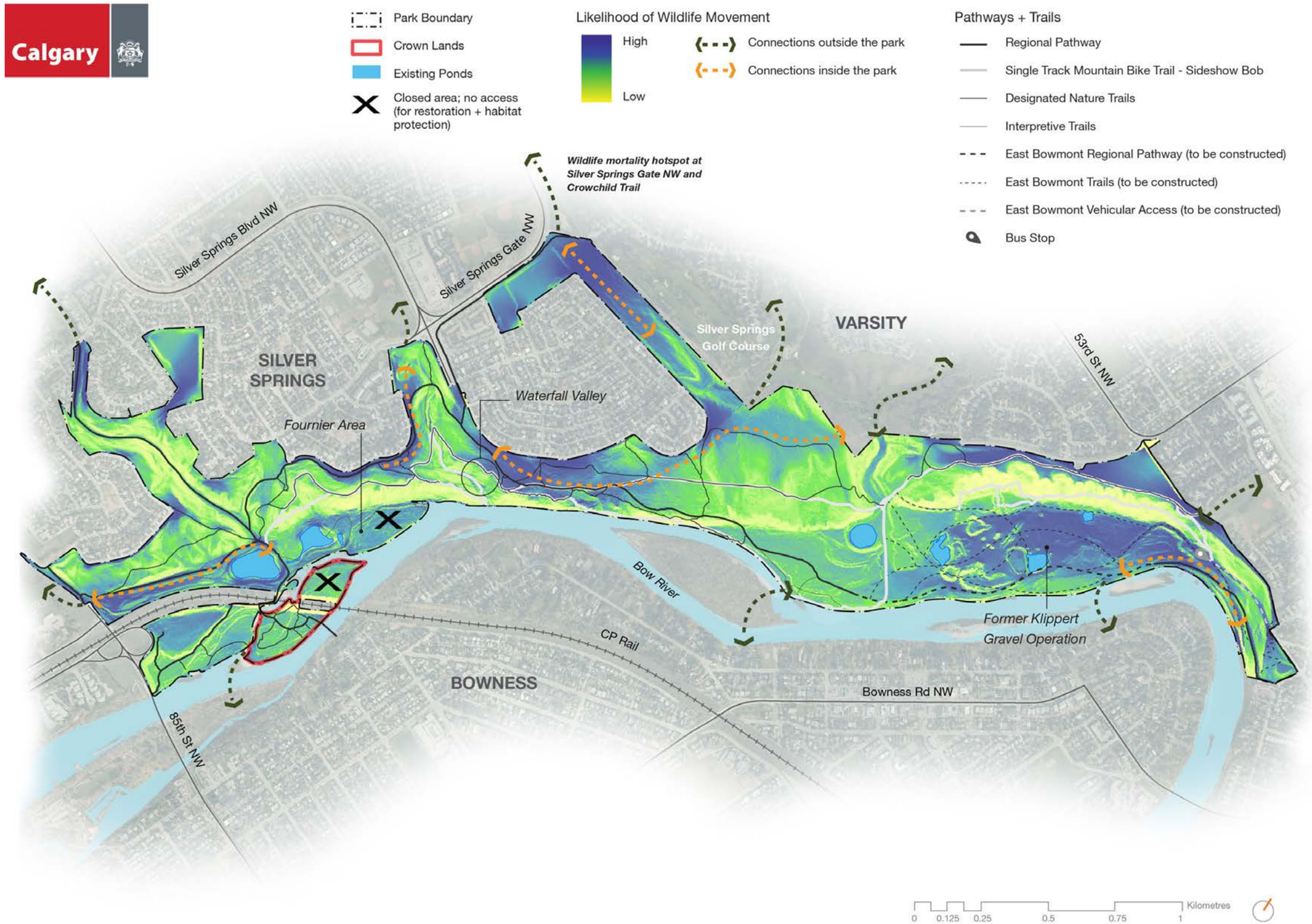
MAP 9. AQUATIC HABITAT

3.5.4 WILDLIFE CONNECTIVITY

Connectivity through the area was assessed using the software Circuitscape (McRae & Shah, 2009). The model estimates the likelihood of wildlife movement through the landscape, in response to perceived landscape friction. Friction values are estimated using land cover and terrain. The friction for the following land cover types are listed in ascending order: undisturbed natural vegetation cover; wetlands and disturbed vegetation; open water and urban areas; and buildings and roads. Steeply sloped areas receive higher friction values than flat areas.

Highest values occur when wildlife movement is restricted by high friction land cover types, such as roads, urban development, large open water areas, and steep slopes. Pinch points form as wildlife paths avoid these restrictions, funneling movement through specific corridors in the landscape. In areas with lower friction, such as flat lands dominated by relatively natural terrestrial vegetation, movement paths take on a more diffuse pattern with fewer pinch points, and there are many more options for moving across the landscape. These areas show moderate likelihood of movement. Areas with no natural cover, or those with very steep slopes, will show very low likelihood of movement, as passage through these areas only occurs when it is the only means of moving between more natural cover. The likelihood of wildlife movement (from high to low) through the park, as well as important connections to other natural areas in the city, are shown in Map 10.

Bowmont NEP is indirectly linked to 12-Mile Coulee and Douglas Fir Preserve above Bowness Park. There are known wildlife movement corridors across the Bow River under Stoney Trail. Habitat connections and the amount of escape terrain have continued to decrease over the years as the city has grown. However, the riparian corridor present in Bowmont NEP serves as an important link in the river valley system. In summer months, the river is likely to serve as a barrier to movement to and from the south; however, winter passage across the frozen river is likely.



MAP 10. LIKELIHOOD OF WILDLIFE MOVEMENT

4 Vision and Objectives

The following vision and objectives were developed for the 2004 Bowmont NEP Management Plan, and remain strong and relevant today.

They reflect and support intentions for the park as a Major Natural Area, as defined by the Natural Area Management Plan (1994).

4.1 Vision

Bowmont Natural Environment Park is a Major Natural Area in Calgary's northwest. Situated on the north shore of the Bow River, Bowmont is a long linear park that preserves native grasslands, riverine balsam poplar forests, and streambank habitats. The park has a high diversity of landforms, including escarpments, ravines, springs, flood plain, floodway, and islands. The parkland will be protected and managed to ensure it continues to fulfill its ecological functions, while providing for sensitive human use. Park development and management will provide opportunities for appropriate levels of access to people so that they can enjoy and appreciate the natural environment, while ensuring the park's protection and restoration where required.

4.2 Objectives

The following objectives support the vision for Bowmont NEP, providing specific goals for upholding the integrity of the park as a Major Natural Area. These objectives directly relate to management recommendations outlined in Chapter 6 of this plan.

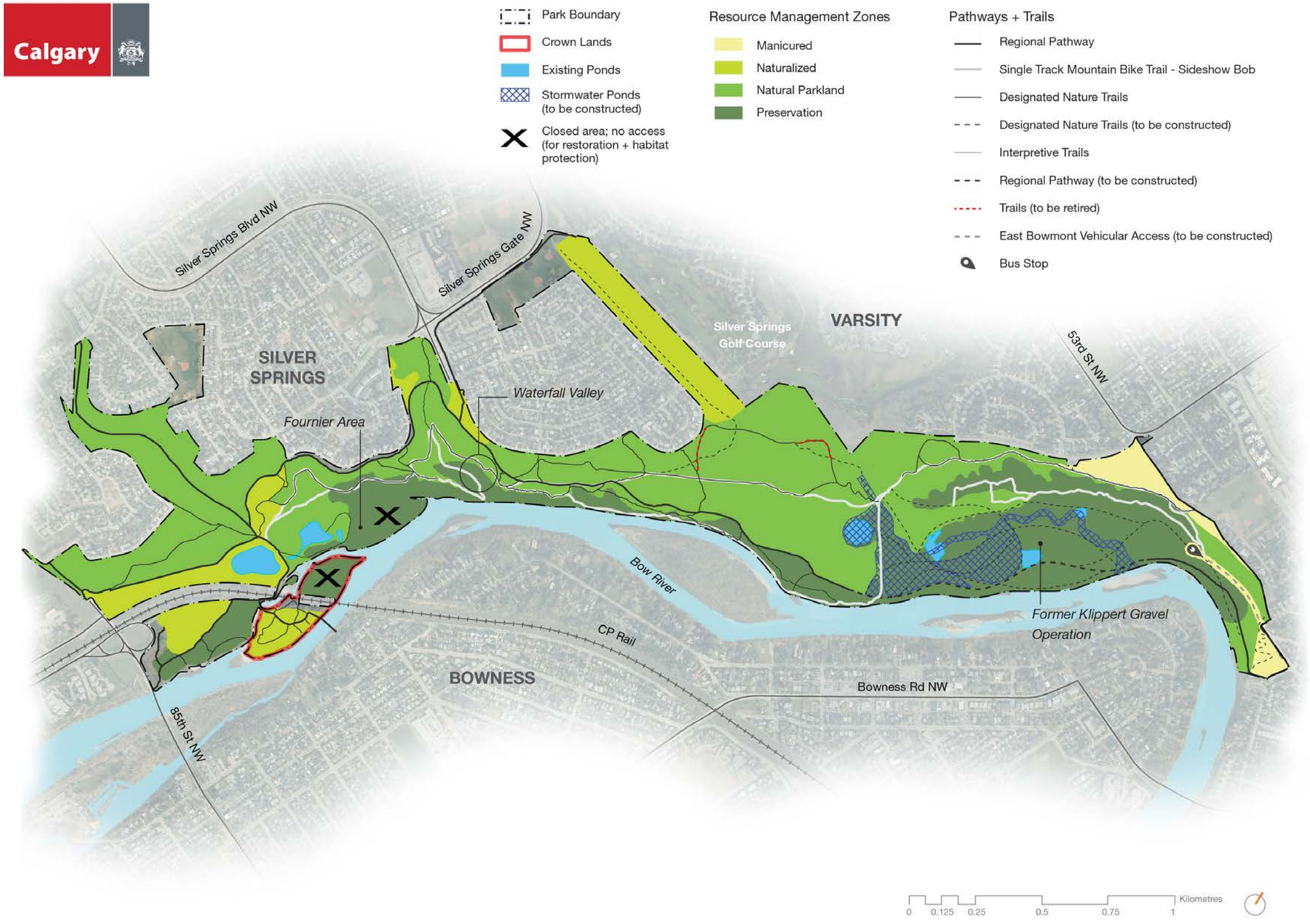
- Maintain the natural environment in its native state with an emphasis on maintaining or enhancing the biological diversity of the area.
- Ensure public access, safety, and use at the appropriate environmentally-sensitive level.
- Conform to Council-approved policy and plans.
- Give precedence to the protection of wildlife (both flora and fauna) and natural resources over human use where the two come into serious conflict.
- Provide volunteer, education, and interpretive opportunities.

5 Resource Management Zones

Resource zonation is a management tool used to define suitable dominant management strategies/goals in specific areas of the park.

Resource areas are based on environmental sensitivity (to disturbance), resource significance (relative to city-wide and park-specific perspectives), suitability as wildlife habitat, and general habitat condition.

In light of changing conditions and use patterns in Bowmont NEP since 2004, the resource management zones for the park have been reconfigured to ensure zonation supports appropriate use and protection needs across different areas of the park. These zones are not meant to be used as strict regulation, but rather to provide guidance in decision-making. Resource management zones are described below, and illustrated in Map 11.



MAP 11. RESOURCE MANAGEMENT ZONES

- **Preservation:** Areas requiring the highest level of protection. These are areas of relatively unfragmented habitat, which are considered higher-quality and worthy of more intensive management practices to maintain their natural, undisturbed state.

  The key management objective in this resource management zone is to prevent habitat deterioration (e.g. invasion of non-native species, soil compaction, effects of human and dog traffic, noise, and fragmentation).

- **Natural Parkland:** Areas that may contain less sensitive vegetation than those in the Preservation zone. The primary role of this management zone is habitat protection, but public use may be appropriate if monitored and managed.

  The primary management objective for this resource management zone is to prevent deterioration and, if possible, to improve habitat quality to the level of the Preservation zone.

- **Naturalized:** Areas that have been previously manicured, cultivated, or otherwise disturbed. These areas provide the greatest potential for recreational activities, including off-leash dog use. Naturalization of these areas (e.g. tree planting and restoration) is encouraged.

- **Manicured:** Areas that have been intentionally set aside for recreation and/or facilities and amenities to support recreation, such as mowed areas and playgrounds. These areas contain non-native vegetation.

- **Crown Land:** A small portion of Bowmont NEP is currently owned by the Province as Crown Land. While this land is publicly accessible, resource management for this area is under Provincial jurisdiction.

6 Management Recommendations

The following chapter outlines recommendations for the major management categories applicable to Bowmont NEP.

Management categories include:

- Pathways and Trails
- Access and Amenities
- Habitats
- Off-Leash Dog Areas
- River Access
- Park Maintenance
- Safety and Enforcement
- Education and Stewardship

Management recommendations are the product of careful review of recent plans, policies, and studies, detailed site analysis, and the results of a public engagement process. Each management category below provides a brief background on existing issues, relevant City policies, and recommendations for sustainable management in alignment with the vision and objectives for Bowmont NEP.

While the portion of the park that is currently crownland is publicly accessible, responsibility for resource management in this area rests with the province. This represents a challenge for ongoing management of the park due to the connectivity and prominance of the cornw-owned portion in relation to the rest of Bowmont NEP. Therefore it is a general recommendation of this plan that the City of Calgary pursue an agreement with the province in regards to future ownership and responsibility for maintaining this area.

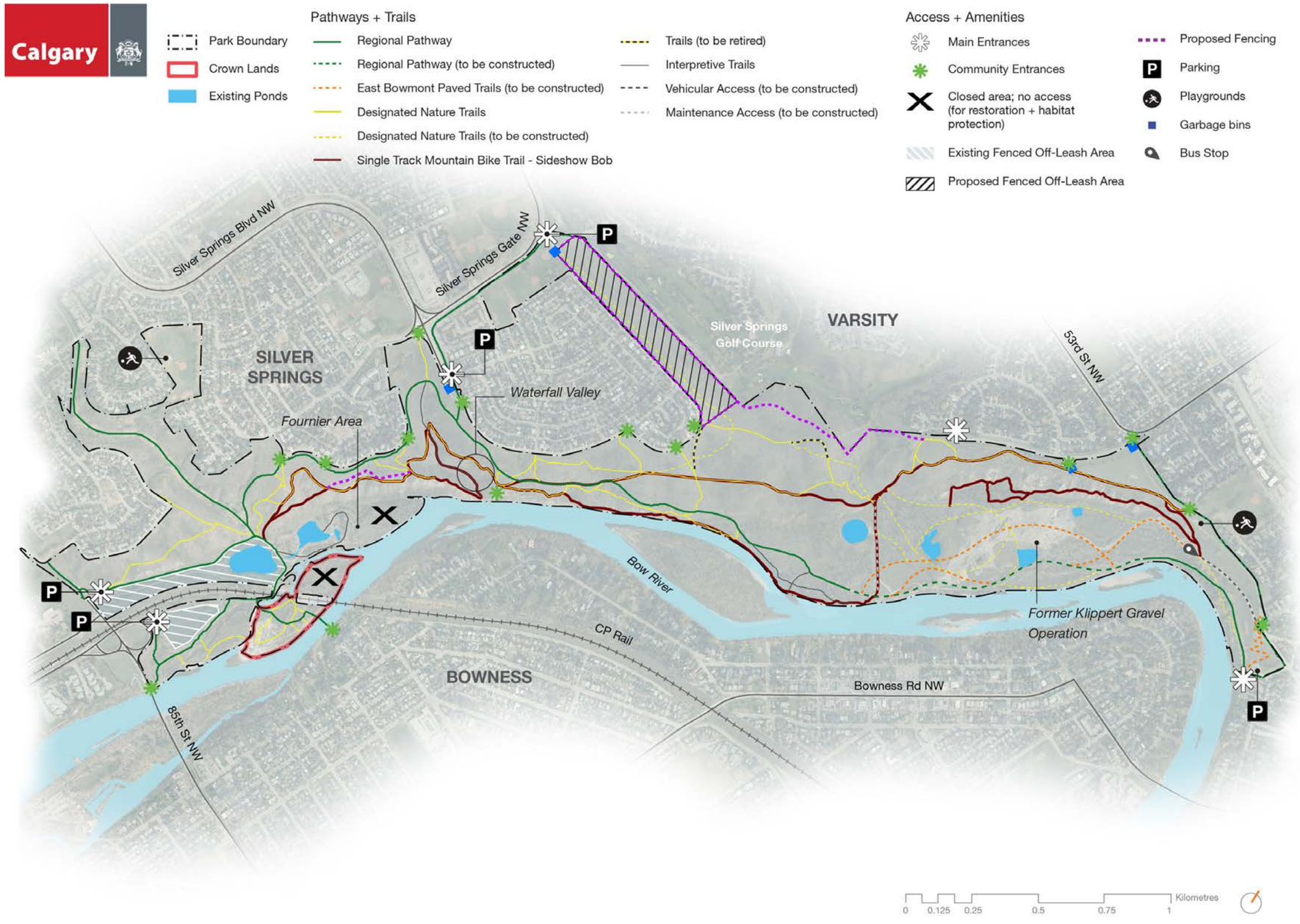
6.1 Pathway and Trail Management

The proliferation of undesignated trails continues to be a major issue in Bowmont NEP. These human foot paths, which stray from the designated park trails, degrade and fragment natural habitat. Many of the trail upgrades completed in 2008 were successful in curbing off-trail use; however, improvements can still be made to address this issue, such as closing certain undesignated trails and selectively formalising others.

The regional pathway, which was over 20 years old when the original management plan was written, had many sections in need of improvement due to heaving, cracks, poor drainage, sightlines, and alignment. Since that time, improvements to the regional pathway have largely been completed, but some of the same issues remain. For example, certain areas of the pathway are being undermined by erosion. Elsewhere in the park, pathway connections to adjacent neighbourhoods and parks could be improved.

Minor re-alignments to select trails in the park are proposed, as illustrated in Map 12, but final trail alignment will be subject to City trail policies and strategies, such as the Calgary Pathway and Bikeway Plan (2000), and Pathways and Trails Work Plan (2016). These re-alignments are proposed to reduce off-trail travel and provide clearer edges to off-leash areas in the park.

Trails and pathways that are located within the Crown Land portion of the park are publicly accessible, and represent a potential extension of the trail system for Bowmont NEP.



MAP 12. PATHWAYS, TRAILS, ACCESS, AND AMENITIES

EXISTING POLICIES

- Calgary Natural Area Management Plan (1994)
- Cycling Policy on Undesignated Trails in Parkland (1998)
- Calgary Urban Park Master Plan (1994)
- Animal Control Bylaw (23M89)

RECOMMENDATIONS

1. **Pathway and Trail Safety:**
   a. Develop an undesignated trail closure plan
   b. Continually review the pathway and trail network to ensure it is meeting the demands of the public
2. **Trail Design and Maintenance:**
   a. Designated trails and pathways will be maintained and upgraded as required
   b. Trail design principles will be in accordance with City of Calgary standards and will follow the City of Calgary Development Guidelines and Standard Specifications for Landscape Construction, and the International Mountain Biking Association (IMBA) trail building principles wherever possible
   c. Trail surfacing will be varied, and will be intended primarily to ensure sustainability of the trail. Surfacing material will be determined depending on site-specific conditions
3. **Pathway Connections:**
   a. Make pathways connections to adjacent communities and parks more prominent through additional signage, or enhancements to existing signage

6.2 Access and Amenities

Public engagement on park access and amenities in Bowmont NEP revealed that users are generally satisfied, but certain amenities could be added or improved to enhance their experience. Park users like the variety of trails, as well as the boardwalks and interpretive trails. Playgrounds are well used, but the location of one in a dog off-leash area presents safety concerns and conflicts with the guidelines of the Calgary Off-Leash Area Management Plan (2010).

Site analysis and the public engagement process revealed few issues with parking in Bowmont NEP. With the re-development of the former Klippert gravel pit as an ecological and recreational amenity, additional parking is needed to accommodate increasing numbers of visitors drawn by this new area. The East Bowmont Design Development Plan (2014) took measures to ensure that there will be adequate parking in East Bowmont to accommodate greater numbers of visitors (O2 Planning + Design, Inc., 2014).

Access is restricted in certain areas of the park to protect critically sensitive habitats. These areas are illustrated on Map 12. Recommendations for protection of these areas via signage and fencing are addressed in sections 6.3 and 6.8.

EXISTING POLICY

- Calgary Urban Park Master Plan (1994)

RECOMMENDATIONS

1. **Access and Wayfinding:**
   a. Review signage locations to ensure proper placement
   b. Improve vehicular access to parking areas, and pedestrian access from surrounding neighbourhoods
2. **Park Amenities:**
   a. Review locations of trash bins to ensure they are located in appropriate locations
3. **Parking:**
   a. All parking lots need to be formalised with clearly defined edges
   b. Parking lot surfacing will follow Low Impact Development guidelines where practical

6.3 Habitats

Habitat types and important natural systems were identified in the Calgary Natural Area Management Plan (1994). Protected natural areas include those with important vegetation communities and intact ecological associations. Bowmont Park was identified as a component of the City of Calgary Major Natural Area system, and is a Natural Environment Park. Habitat specific management recommendations applicable to Bowmont NEP can be referenced in the Calgary Natural Area Management Plan. Similarly, the management of problem wildlife for habitat protection (e.g. beavers) should be directed by the Calgary Integrated Pest Management Plan (2004). Ongoing restoration planning for specific areas of the park shall be undertaken by the City to prioritize and address restoration projects as needed. All habitat management strategies should align with the resource management zones for the park (Map 11).

EXISTING POLICY

- Calgary Natural Area Management Plan (1994)
- Calgary Environmental Policy (2012)
- Our BiodiverCity, Calgary's 10-year Biodiversity Strategic Plan (2015)
- Calgary Integrated Pest Management Plan (2004)

RECOMMENDATIONS

1. **Habitat Protection:**
   a. Protection of significant habitats (all habitats within the park's Natural Parkland and Preservation zones, Map 11) will take precedence over recreational uses when the latter may conflict with the viability of the habitat
   b. Protect the sensitive escarpment
   c. Wood and brush downfall, tree stumps, and snags will be left in place where safety is not a concern
   d. Consider seasonal access restrictions to protect seasonally sensitive wildlife
   e. Provide protection for river edges, ravines, and other sensitive habitats functioning as wildlife corridors
   f. Ensure that fish spawning grounds and other sensitive habitats are a priority when determining potential river access points
   g. Maintain fencing and signage designed to prevent access to sensitive areas of the park
2. **Habitat Restoration:**
   a. Use restoration techniques to enhance existing habitats where required
   b. Naturalize river bank stabilization approaches to provide greater habitat and aesthetic value

6.4 Off-Leash Dog Areas

Off-leash dog use within Bowmont NEP remains one of the most attractive features of the park, but also one of the most difficult to manage. The original off-leash boundaries were confusing to users and did not align with the recommendations of the 2010 Off-Leash Area Management Plan (OLAMP). In addition, recommendations made for dog designations following the five year Off-Leash Pilot Study (2009) indicated a need to reconfigure the off-leash boundaries in Bowmont Park to improve the overall sustainability and user experience of the park (Map 13).

On a city-wide basis, conflicts have been observed between off-leash park users and other recreational users. Conflicts arise due to poorly communicated regulations, inadequate signage, and expected park user experience. In addition, instances of conflict between off-leash users and City enforcement officers have been noted by City Parks staff. It is possible that these conflicts are caused by inadequately communicated information regarding City by-laws related to off-leash use in parks, or confusion about the boundaries of off-leash areas.

To ensure alignment with recent plans and study recommendations, Bowmont's off-leash areas were reviewed and updated as part of this management plan. Feedback received from public engagement regarding off-leash use of the park informed the management plan. Management recommendations related to off-leash use in Bowmont NEP were updated as well to ensure consistency with the new boundaries and city-wide off-leash guidelines. The updated configuration of off-leash areas in the park is illustrated in Map 13.

EXISTING POLICY

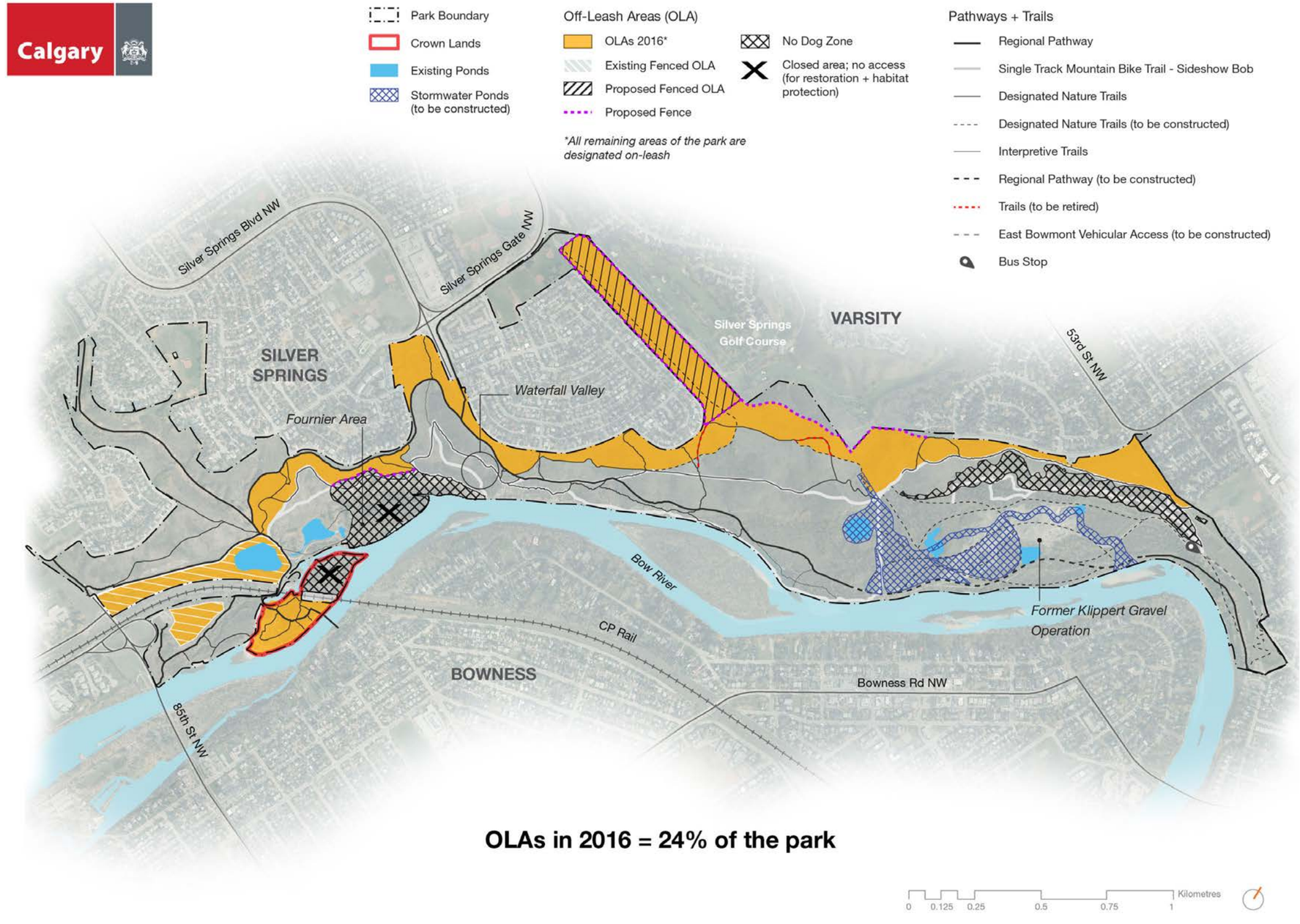
- Calgary Off-Leash Area Management Plan (2010)
- Animal Control Bylaw 23M89
- Calgary Natural Area Management Plan (1994)

EXISTING STUDIES

- Bowmont NEP Off-Leash Dog Pilot Project: Baseline Biophysical Inventory (EBA Engineering Consultants Ltd., 2005)
- Bowmont NEP Off-Leash Study: Issues, Options, and Recommendations (EBA Engineering Consultants Ltd., 2009)
- Bowmont Natural Park Bird Breeding Surveys (Sweetgrass Consultants Ltd., 2010)
- Rare Vascular Plant and Ecological Community Survey for Bowmont NEP (Westhoff Engineering Resources Inc., 2012)
- Off-Leash Assessment for Bowmont Natural Environment Park (Westhoff Engineering Resources Inc., 2013)

RECOMMENDATIONS

3. **Off-Leash Boundaries:**
   a. Re-align off-leash areas to well-defined edges to establish clear boundaries
   b. Where clear boundaries are not visible, provide identifiable edges for off-leash areas
   c. Off-leash areas should only be allowed in disturbed areas and areas of non-native vegetation
   d. Off-leash boundaries should be re-evaluated and adjusted as needed to ensure that ongoing use is sustainable
4. **Off-Leash Signage:**
   a. Enhance or provide additional signage to clarify off-leash and no dog zones
5. **Understanding Conflict:**
   a. Off-leash dog use within the park recieved the most public feedback, both positive and negative. Further investigation into education, communication, and effective methods of enforcement for off-leash dog use in City parks is highly recommended. This update to the Bowmont NEP management plan provides an excellent opportunity for a focused study to improve public-City relations in this regard.



MAP 13. OFF-LEASH AREAS (2016)

6.5 River Access

Public access to the river is one of the most desired qualities in any riverside park, and continuous access to all river and creek banks is a long term objective of the Calgary River Valleys Plan (1984). Unfortunately, uncontrolled access can have significant negative impacts on ecosystem health and riverbank stability over time. Areas along the banks of the Bow River are eroding, as is typical of natural river dynamics. However, off-trail park use appears to have exacerbated natural erosion levels by removing vegetation and damaging soils. Access to the river in areas sensitive to erosion, in particular places with exposed and steep banks, should be limited (Golder Associates, 2007).

In light of changes in the river channel following the 2013 flood, and the historical presence of fish spawning areas in the Bow River adjacent to the park, a feasibility study should be conducted to ensure the most sustainable locations for river access. The results of the Calgary Rivers Morphology and Fish Habitat Study (2015) should be consulted during the feasibility study as the most up-to-date source on existing fish habitats and ecological changes resulting from the 2013 flood (Klohn Crippen Berger, 2015).

EXISTING POLICY

- Calgary River Valleys Plan (1984)
- Calgary Environmental Policy (2012)

RECOMMENDATIONS

1. Conduct a feasibility study to evaluate river access points
2. Ensure environmental considerations are included in the study as per City of Calgary Environmental Policy (2012)
3. The feasibility study should also include a statement of impact on adjacent land uses as per Calgary River Valleys Plan (1984)
4. All river bank alterations must comply with federal and provincial requirements, if applicable
5. Where deemed appropriate, hardened river access points are to be kept as natural as possible
6. River park walkways and facilities must minimize environmental and social impact on adjacent land uses
7. Install signage to direct users to appropriate river access sites

6.6 Park Maintenance

Calgary Parks is changing the way it cares for green spaces throughout the city, including a Naturalization Initiative started in 2010 in support of the City of Calgary's biodiversity strategy (Our BiodiverCity: Calgary's 10-year Biodiversity Strategic Plan). The initiative is intended to increase plant and animal diversity and reduce the need for regular maintenance by identifying options and opportunities for moving toward a more natural state. Hardy grasses, trees and shrubs are used to re-landscape select sites. Once established, maintenance may be reduced to simply controlling weeds and garbage removal (City of Calgary, 2015).

Guidelines for open space use and maintenance, including parks, are outlined in the City of Calgary Open Space Plan (2003). Routine weed control measures for the Bowmont NEP should follow the guidelines of the Integrated Pest Management Plan (2004), as well as the Natural Area Management Plan (1994).

EXISTING POLICY

- Calgary Open Space Plan (2003)
- Calgary Integrated Pest Management Plan (2004)
- Our BiodiverCity: Calgary's 10-year Biodiversity Strategic Plan (2015)
- Calgary Natural Area Management Plan (1994)

RECOMMENDATIONS

1. **Review and Assessment:**
   - a. Customer level service will continue, along with an ongoing review of maintenance practices to ensure alignment
   - b. Develop performance metrics to ensure success of maintenance and restoration activities
   - c. Identify areas of the park for management under the City's Naturalization Initiative
2. **Maintenance Practices:**
   - a. Maintenance regimes should be appropriate for the natural resource management zones of the park (Map 11)
   - b. Wherever possible, maintenance vehicle access to the park will be restricted to designated maintenance access roads, dirt roads, and surfaced trails
   - c. Low impact equipment will be used whenever possible in all maintenance activities
   - d. Herbicides and pesticides shall be applied in accordance with manufacturer's recommendations, government legislation, City bylaws, and the Integrated Pest Management Policy.

6.7 Safety and Enforcement

The public engagement process for the development of this management plan revealed several concerns surrounding vandalism and safety in the Bowmont NEP. Many of these issues are location specific, with the former Klippert gravel pit site in East Bowmont and the former Fournier property standing out as hotspots for parties, littering, potential fire risk, trespassing into access-restricted areas, and vandalism (Figure 4). A lack of enforcement surrounding off-leash use outside of designated areas, and cyclists speeding in the park also came to light during the engagement sessions. Targeted bylaw enforcement is needed in areas where these infractions occur most frequently, as illustrated in Map 14.

EXISTING POLICY

- City of Calgary Parks Bylaw 36/76
- City of Calgary Parks and Pathways Bylaw 20M2003

RECOMMENDATIONS

1. **Vandalism and Unsupported Use:**
   - a. City staff will clean up and/or repair vandalised areas as promptly as possible
   - b. Provide or enhance signage where violations consistently occur (e.g. off-leash infractions, off-trail travel, vandalism, etc.)
2. **Bylaw Enforcement:**
   - a. Increase bylaw presence in areas prone to unsupported or illegal activities

FIGURE 4. EXAMPLE OF VANDALISM IN BOWMONT NATURAL ENVIRONMENT PARK

6.8 Education and Stewardship

The citizen-based Bowmont NEP Communication and Stewardship Committee has played an important role in communicating environmental awareness to the broader public. A number of user groups and Community Associations in the area have also made valuable contributions to an ethic of stewardship in the park, through activities such as photo contests and participation in volunteer restoration projects.

Several Community Associations (Varsity Community Association, Montgomery Community Association, Bowness Community Association/Society of Bowness Residents, Silver Springs Community Association) and user groups (Calgary River Valleys, Nature Calgary, Calgary Field Naturalists Society, Off-Leash Calgary, Calgary Mountain Bike Alliance, Calgary Pathways Advisory Council, Bike Calgary, Calgary Roadrunners Club and others) were given an opportunity to engage in the planning process during each project phase. Early involvement in the project by these groups encourages park stewardship by fostering a sense of community ownership. In addition, their feedback will help inform future opportunities for active stewardship of the park.

Calgary's long term vision, as described by the imagineCALGARY Plan for Long Range Urban Sustainability (2015), emphasizes connectivity between people, places, and communities. The development of education and awareness programs for eco-friendly design, sustainable development, active transportation, waste reduction, and water conservation are all strategies included in the plan which may be applicable to an education strategy for Bowmont Park.

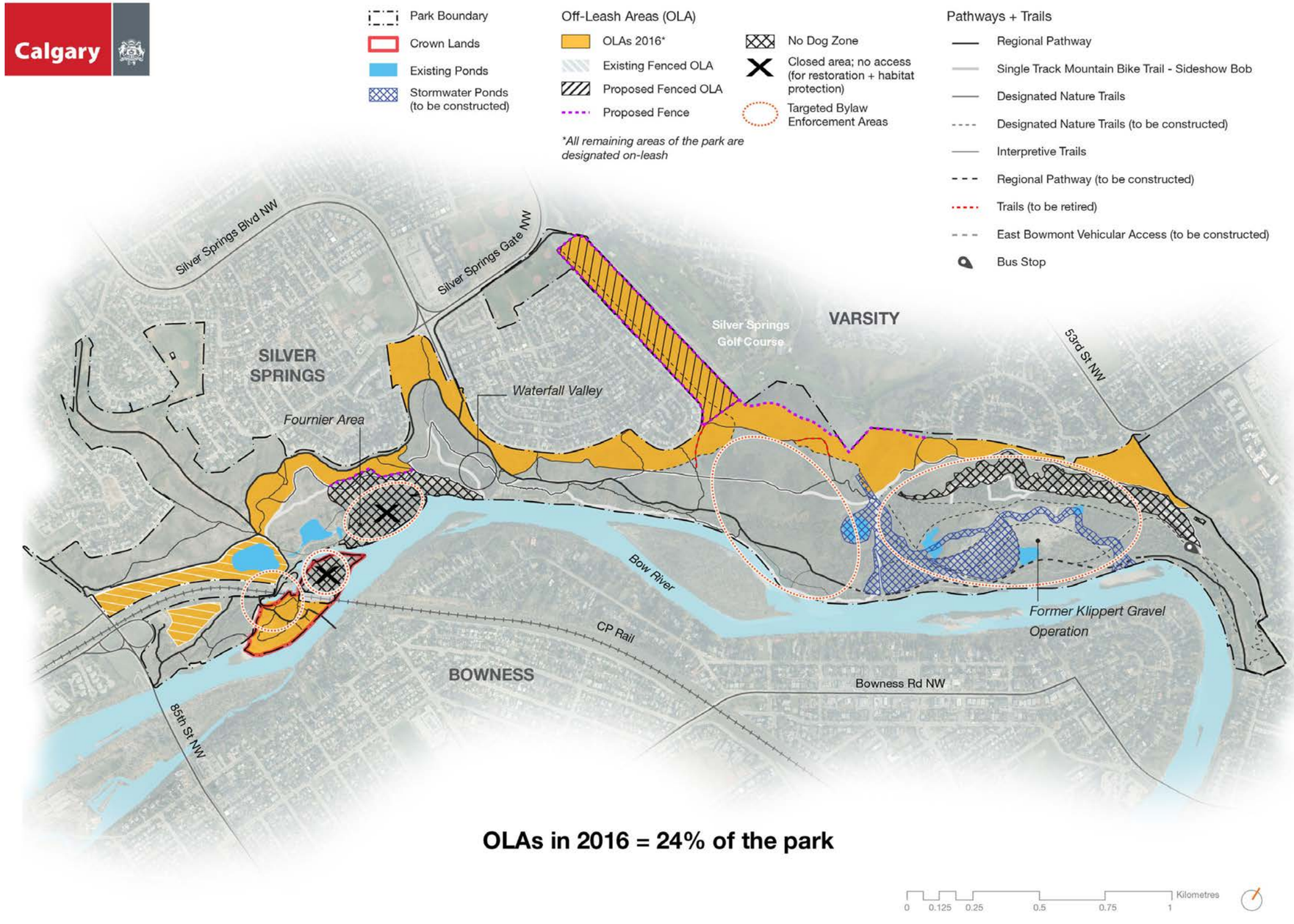
The recommendations below contribute to promoting an ethic of stewardship through opportunities to get involved in park restoration activities or public environmental education going forward.

EXISTING POLICY

- imagineCALGARY Plan for Long Range Urban Sustainability (2015)
- Calgary Urban Park Master Plan (1994)
- Calgary Natural Area Management Plan (1994)

RECOMMENDATIONS

1. **Education Strategy:** Develop a park environmental education plan to promote an understanding of the special ecological features and qualities of Bowmont Park. The plan would include program objectives, key messages for the park, target audiences, and potential methods for addressing those objectives and audiences that can be implemented over a 5-year period. Key messages include:
   a. Definition of natural areas and their intended nature-based recreational uses
   b. City Naturalization Projects
   c. Stormwater treatment and riparian environments
   d. Habitat restoration, conservation and protection
   e. Environmental stewardship and shared responsibility
2. **Education Program:** Develop and deliver environmental education programs for the park based on the environmental education strategy:
   a. Develop new programs related to new elements such as stormwater and riparian environments
   b. Enhance signage to promote an ethic of stewardship and shared responsibility
   c. Develop educational signage to increase understanding of closures due to restoration or habitat protection
   d. Consider youth as a target audience for education in the park including school tours, camp programs, and youth leadership training
3. **Volunteer Programs:** Develop and deliver meaningful and appropriate volunteer opportunities in the park based on the environmental education strategy and program. Work with internal and external stakeholders to develop the project plans. Plans may include:
   a. One-time volunteer stewardship projects identified by the City
   b. Park interpretation volunteers
   c. Park stewardship volunteers to monitor and enhance biodiversity on a regular basis



MAP 14. TARGETED BYLAW ENFORCEMENT AREAS

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