



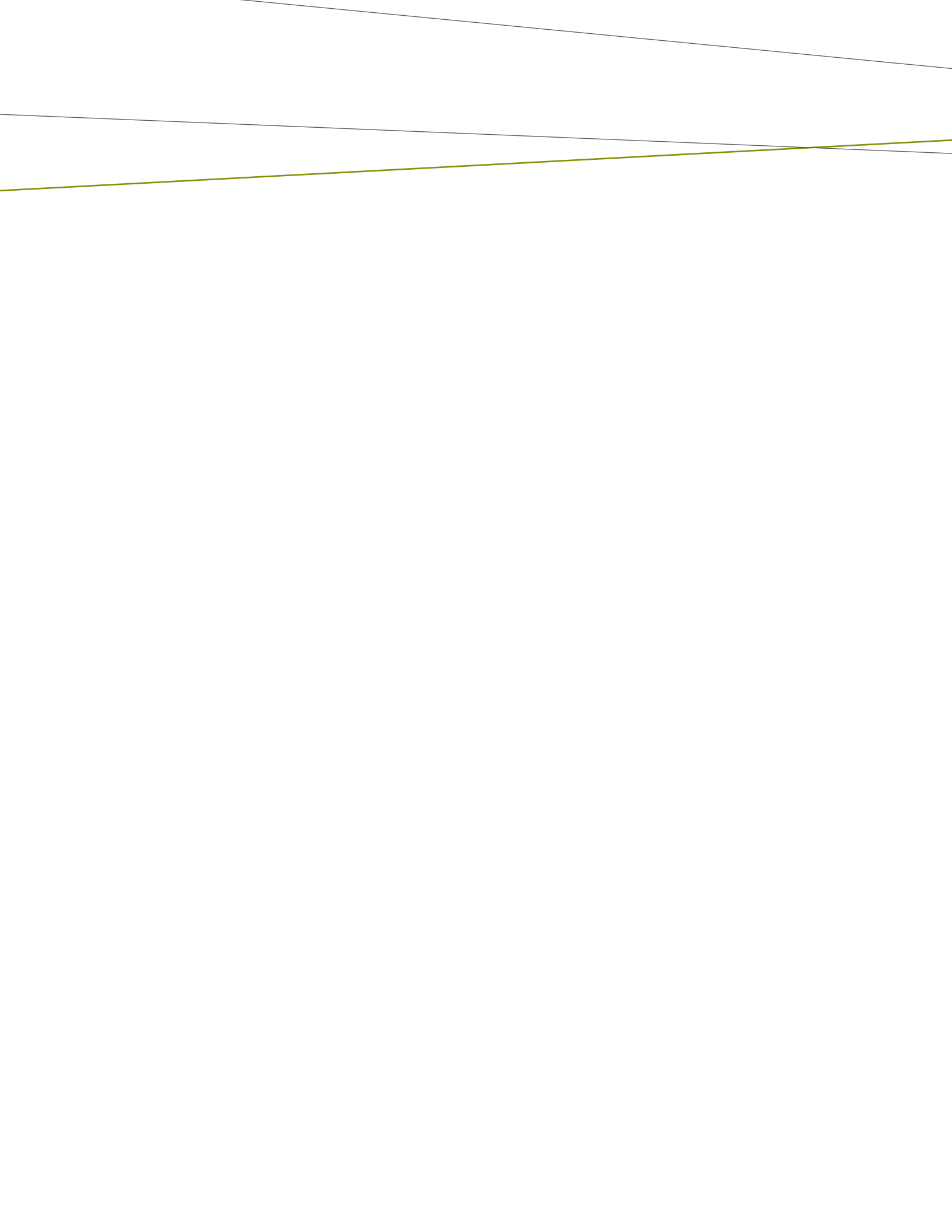
CITY-WIDE NATURAL AREA MANAGEMENT PLAN

JANUARY 2014

TRANSFORMING | **EDMONTON**

BRINGING OUR CITY VISION TO LIFE





CONTENTS

1.0 INTRODUCTION	1	5.0 THE NATURAL AREAS MANAGEMENT FRAMEWORK	18
1.1 PLAN PURPOSE	1	5.1 GUIDING PRINCIPLES	19
1.2 NATURAL AREAS DEFINED	1	5.2 MANAGEMENT OBJECTIVES AND STRATEGIES	20
1.3 PURPOSE	2	5.2.1 — <i>Vegetation</i>	20
1.4 A NEW APPROACH TO NATURAL AREA MANAGEMENT	2	5.2.2 — <i>Wildlife and Habitat</i>	23
1.5 OVERVIEW OF THE MANAGEMENT PLAN FRAMEWORK	3	5.2.3 — <i>Safety</i>	24
1.6 PLAN OVERVIEW	4	5.2.4 — <i>Hydrology and Water Resources</i>	26
		5.2.5 — <i>Human Use</i>	27
		5.2.6 — <i>Education</i>	27
2.0 THE MANAGEMENT PLAN IN CONTEXT	5	5.3 OPERATIONAL GUIDELINES	28
2.1 INSTITUTIONAL CONTEXT: ROLES AND RESPONSIBILITIES FOR ECOLOGICAL PROTECTION	5	5.3.1 — <i>Vegetation</i>	33
2.2 PLAN AND POLICY CONTEXT	6	5.3.2 — <i>Wildlife And Habitat</i>	36
2.2.1 — <i>City of Edmonton (Municipal)</i>	6	5.3.3 — <i>Safety</i>	39
2.2.2 — <i>Government of Alberta (Provincial)</i>	8	5.3.4 — <i>Hydrology and Water Resources</i>	43
2.2.3 — <i>Government of Canada (Federal)</i>	9	5.3.5 — <i>Human Use</i>	44
		5.3.6 — <i>Education</i>	46
3.0 EDMONTON'S BIOPHYSICAL SETTING	11	5.4 SITE-SPECIFIC CONDITIONS AND RECOMMENDATIONS	47
3.1 THE BIOPHYSICAL ENVIRONMENT	11		
3.1.1 — <i>Climate</i>	11	6.0 COMMUNITY STEWARDSHIP STRATEGY	48
3.1.2 — <i>Soils And Geology</i>	12	6.1 MASTER NATURALISTS	48
3.1.3 — <i>Hydrology</i>	12	6.2 COMMUNITY STEWARDSHIP GROUPS	48
3.2 ECOLOGY OF THE EDMONTON LANDSCAPE	12	6.2.1 — <i>Academic Institutions</i>	49
3.2.1 — <i>Flora of The Edmonton Area</i>	13	6.2.2 — <i>Conservation Organizations</i>	49
3.2.2 — <i>Fauna of The Edmonton Area</i>	13	6.3 CITY COMMUNITY CONSERVATION PROGRAMS	51
		6.3.1 — <i>Partners In Parks</i>	51
		6.3.2 — <i>Naturescapes</i>	51
4.0 MANAGEMENT CHALLENGES IN NATURAL AREAS	15	6.4 CITIZEN SCIENCE	51
4.1 LOSS/FRAGMENTATION OF HABITAT	15		
4.2 EFFECTS OF INVASIVE SPECIES	16	7.0 MANAGEMENT PLAN IMPLEMENTATION	52
4.3 EROSION	16	7.1 INTEGRATION INTO CURRENT PRACTICE	52
4.4 EFFECTS OF HUMAN USE	16	7.2 MONITORING	52
4.5 HUMAN/WILDLIFE INTERACTIONS	17	7.3 REPORTING	53
		7.4 CONTINUAL IMPROVEMENT THROUGH ADAPTIVE MANAGEMENT	54

8.0 GLOSSARY	56
9.0 ACKNOWLEDGEMENTS	59
10.0 REFERENCES	60
APPENDICES	62
APPENDIX A — EDMONTON'S ECOLOGICAL NETWORK	62
APPENDIX B — NATURAL AREAS MANAGED BY PARKS BRANCH	63
APPENDIX B — MANAGED NATURAL AREAS IN NORTHWEST DISTRICTS	64
APPENDIX B — MANAGED NATURAL AREAS IN SOUTHWEST DISTRICTS	66
APPENDIX B — MANAGED NATURAL AREAS IN SOUTHEAST DISTRICTS	68
APPENDIX B — MANAGED NATURAL AREAS IN NORTHEAST DISTRICTS	70
APPENDIX B — MANAGED NATURAL AREAS IN THE RIVER VALLEY AND RAVINE SYSTEM	72

LIST OF TABLES

TABLE 3.1: EDMONTON'S WILDLIFE SPECIES AT RISK (2005 ALBERTA GENERAL STATUS OF WILDLIFE SPECIES REPORT).	14
TABLE 5.1: PARKS OPERATIONAL RESPONSIBILITIES, ACTIONS AND SCHEDULES.	30

LIST OF FIGURES

FIGURE 1.1 NATURAL AREA MANAGEMENT PLAN FRAMEWORK	4
FIGURE 5.1: INTER-RELATIONSHIP BETWEEN OBJECTIVES, STRATEGIES AND OPERATIONAL GUIDELINES..	29

1.0 INTRODUCTION



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1.1 PLAN PURPOSE

This City-wide Natural Area Management Plan sets out objectives and strategies for managing and restoring the Natural Areas owned by the City of Edmonton (“the City”). The City is responsible for managing an extensive network of Natural Areas throughout Edmonton’s North Saskatchewan River Valley and Ravine System, as well as wetlands and forest patches in the uplands above the River Valley. In 2013, the City of Edmonton managed approximately 2200 hectares of natural area city-wide.

1.2 NATURAL AREAS DEFINED

Natural areas are areas of land or water that contain a high proportion of native vegetation, and thus provide good habitat for native wildlife. In Edmonton, these areas include forest, wetland and riparian areas, and some areas of peatland and grassland.

While natural areas are part of the city-wide park system that provides the community with access to nature and recreational opportunities, they are a unique subset of parkland. They are different from groomed parks, sports fields and schoolyards both in the opportunities they provide, and in the management challenges they present. Compared to manicured park areas, natural areas require less routine and less intensive management, and the management priorities go beyond human use and access. Although the approaches required are different, active and careful management is no less important, particularly in the context of a rapidly growing urban area such as Edmonton.



PHOTO COURTESY OF DAVE CONLIN

1.3 PURPOSE



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Together with other formal parks and “semi-natural” spaces (such as stormwater management facilities, vegetated road verges and rail and pipeline rights-of-way), natural areas form an “ecological network” (see Appendix A). This network provides many important ecological services, all of which are linked to our own health and well-being.

Among other benefits, the network:

- Provides habitat for native plant and wildlife species
- Provides corridors for the movement and dispersal of wildlife and plant species
- Supports hydrological processes such as groundwater recharge and flood control
- Supports atmospheric and climatological processes such as oxygenation and cooling
- Supports the decomposition of waste
- Supports the cycling of nutrients
- Supports the pollination of crops
- Provides opportunities for education, research and recreation
- Provides protection against uncertain future events (for example, the impacts of climate change) through the maintenance of diversity

Good management of Edmonton’s natural areas will ensure the continuation of these natural processes and services.

1.4 A NEW APPROACH TO NATURAL AREA MANAGEMENT

This Plan represents a new direction in managing Edmonton’s natural areas. Moving forward from a history of site-by-site management, the City is newly committed to a comprehensive and integrated approach.

At its core, this Management Plan supports the management of the ecological network as a whole. The main body of the Plan sets out guiding principles and management strategies to be applied to natural areas city-wide. In addition, when a new natural area is protected, a site-specific management plan will be developed for that area, according to the *Guidelines for Developing Site-Specific Natural Area Management Plans in the City of Edmonton* (City of Edmonton 2014). The site-specific plan provides additional management strategies based on the unique features and management requirements of the site. The site-specific strategies are to be implemented in addition to the city-wide strategies, which apply to all natural areas.

This comprehensive approach will provide many benefits. It will:

- Ensure that natural area management principles and strategies are consistently applied throughout the city, supporting the health of the ecological network as a whole.
- Bring together all of the people currently involved in natural area management in Edmonton: City managers and staff, Master Naturalists, community members and organizations, academics, biologists and other experts.
- Improve the efficiency of natural area management in Edmonton, clarifying both internal roles and responsibilities, and opportunities for community involvement.
- Facilitate decisions about resource allocation.
- Be a “living” document, setting out current best practice for all aspects of management, and evolving to reflect our improved understanding of the function of natural systems and the resources available for their management.
- Be accessible by internal and community partners as a web-based document, with all information in one convenient location.

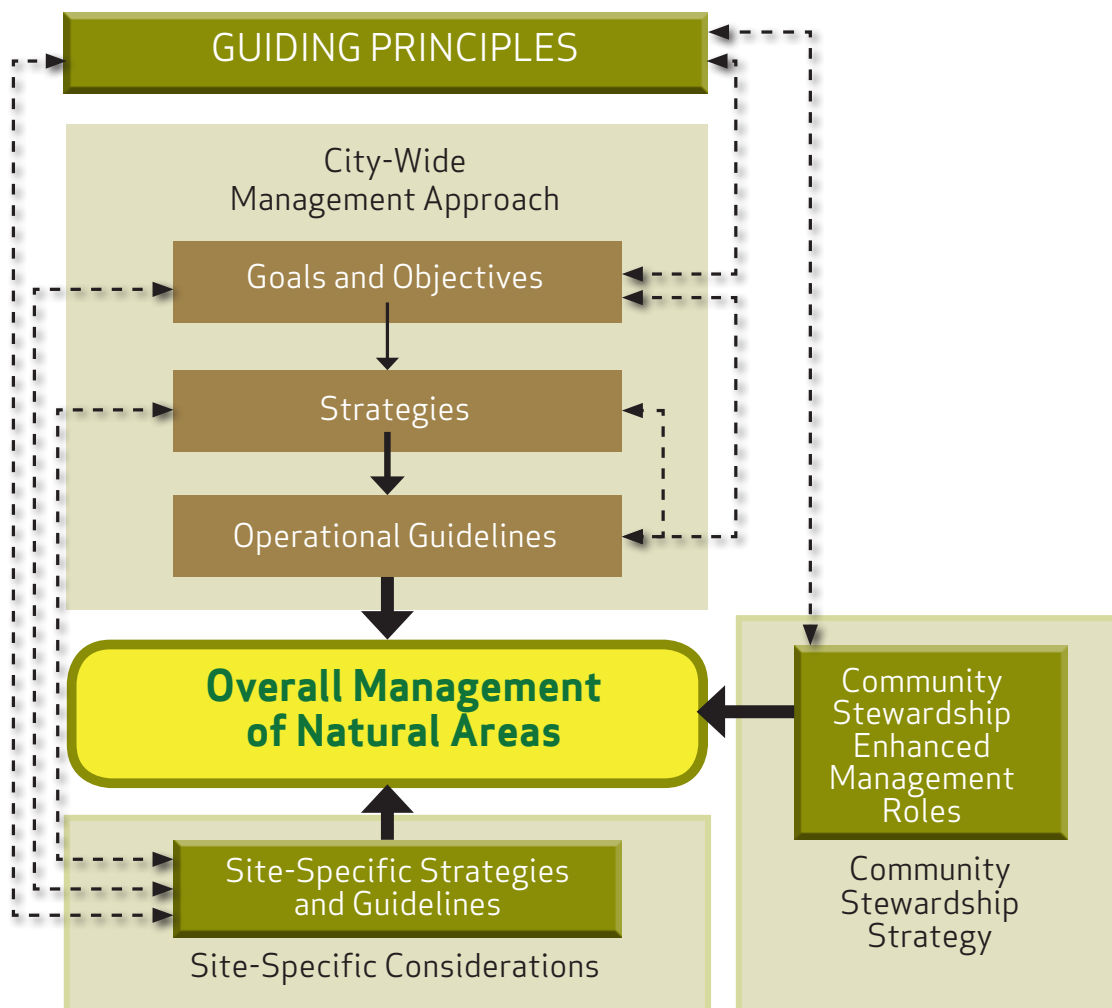
1.5 OVERVIEW OF THE MANAGEMENT PLAN FRAMEWORK

Figure 1.1 provides a representation of the City-Wide Natural Area Management Plan Framework and shows how individual elements interact to support the management approach.

The management approach is rooted in broad guiding principles, which feed into management objectives and strategies (Section 5.2), and more detailed operational guidelines (Section 5.3). Together, these parts of the

framework describe the approach and activities that will be adopted to manage Edmonton's natural area system as a whole. Management information about individual natural areas is contained in the site-specific management plans. This section will build as new natural areas are taken into the City's inventory.

FIGURE 1.1 NATURAL AREA MANAGEMENT PLAN FRAMEWORK



1.6 PLAN OVERVIEW

The Plan is broken down into the following sections.

This chapter, **Chapter 1**, introduces the document.

Chapter 2 discusses the institutional and policy context within which the management of Edmonton's natural areas takes place.

Chapter 3 explores the biophysical and biological aspects of Edmonton's landscape.

Chapter 4 discusses some of the management challenges addressed in this Plan.

Chapter 5 presents the guiding principles that direct our management approach, as well as the goals, objectives and operational guidelines set out to meet the management challenges.

Chapter 6 outlines a strategy for engaging the community in the stewardship of Edmonton's ecological network.

Chapter 7 discusses the implementation of this Plan, including integration of the management approach into current planning and operational practices.



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2.0 THE MANAGEMENT PLAN IN CONTEXT



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Many players are involved in managing Edmonton's natural areas, and a wide range of programs, plans, policies and legal requirements guide management activities. The following summary of Edmonton's natural area management context will provide a better understanding of the Plan goals, objectives and operational guidelines.

2.1 INSTITUTIONAL CONTEXT: ROLES AND RESPONSIBILITIES FOR ECOLOGICAL PROTECTION

Responsibility for protecting and managing Edmonton's natural areas is not limited to any one City branch or department. Each branch is responsible for establishing best practice for biodiversity protection based on its own function and mandate. However, the majority of responsibility for protection and management of Edmonton's natural areas falls to a few areas: the Office of Biodiversity; Parks Planning; Landscape Design and Construction; District Operations; and Forestry, Beautification and Environmental Management.

The Office of Biodiversity coordinates conservation efforts across the City. The Office of Biodiversity is responsible for corporate strategic initiatives such as city-wide conservation planning, and for overseeing the implementation of the City's Natural Area Systems Policy and Natural Connections Strategic Plan. The Office of Biodiversity advises other departments on natural area issues, and coordinates other branches of the organization to ensure the right representatives are involved in conservation planning discussion and decision-making. The Office of Biodiversity is also involved with public education

and outreach initiatives, engaging Edmontonians in the protection and management of natural areas.

Parks Planning works with the Office of Biodiversity to ensure that, to the extent possible, natural areas are protected through the current planning process. Coordination between Parks Planning and the Office of Biodiversity is important to ensure natural areas are integrated into the parks system at the earliest stages of the development process. The tools available to the City for the protection of natural and semi-natural spaces are limited, and decisions about how to accommodate all of the City's many priorities with the resources available must be made cooperatively.

Landscape Design and Construction coordinates design and construction activities related to natural area "improvements" (such as trail development, upgrades and new park development) with the Office of Biodiversity and other Parks sections to minimize the impacts of human use on natural features.

Once natural areas have been added to the City's inventory, District operations ensure on-the-ground management guidelines/objectives are implemented. Most of the work required "on the ground" to make sure that these areas remain sustainable and accessible — trail maintenance, removal of hazard trees, construction of fencing, removal of invasive plants, etc. — is done by this unit (see Table 5.1).

Also vital to natural areas management is the work of the Forestry, Beautification and Environmental Management section. Staff in this section play important roles in trail maintenance, tree care, pest control and naturalization. In addition, the Park Rangers unit works in natural areas to address unauthorized use and safety concerns, and provides an additional monitoring and inspection function.

Staff in these areas work alongside those in Drainage Services, Corporate Properties, the Office of Environment and other areas on issues related to natural area purchase, management, design and construction, and public education.

2.2 PLAN AND POLICY CONTEXT

This Management Plan has been shaped by numerous Municipal, Provincial and Federal requirements related to natural area management. Staff must comply with these guidelines and laws when carrying out natural area management activities.

2.2.1 — City of Edmonton (Municipal)

Natural Area Systems Policy (C-531)

The Natural Area Systems Policy was approved in 2007, and states that:

The City of Edmonton will balance ecological and environmental considerations with economic and social considerations in its decision making and demonstrate that it has done so. The City of Edmonton recognizes that it can accomplish the work that is required to achieve conservation more efficiently and effectively by supporting and developing partnerships to achieve effective conservation results. Therefore, the City will lead by example — engaging the public in natural area issues, and encouraging businesses, residents, and the community to secure new natural area systems and steward what we have effectively.

The Policy is supported by a City Procedure, which outlines roles and responsibilities for its implementation by key City branches.

Natural Connections Strategic Plan

In 2007, Edmonton's Office of Biodiversity completed an integrated strategic conservation plan called Natural Connections in order to formalize the City's commitment to biodiversity protection. The plan is based on an ecological network approach that involves identifying key natural elements at an early stage in the planning process, and protecting a comprehensive system of core biodiversity areas, stepping stones and linkages.

The Plan sets out three interconnected, mutually supportive goals, each of which is supported by a set of strategic directions:

1. Secure a functioning ecological network. The City of Edmonton will secure a protected and functional ecological network.

2. Manage Edmonton's ecological network. The City of Edmonton will manage Edmonton's ecological network effectively and will work collaboratively with other conservation agencies to do so.
3. Engage Edmontonians. The City of Edmonton will work with the community to support conservation goals, and will form partnerships with conservation leaders in the community.

Urban Parks Management Plan

The *Urban Parks Management Plan* (UPMP) outlines the City's strategic direction for acquiring, maintaining, and preserving Edmonton's parks, including those that contain natural areas. The plan identifies principles, action steps, and site development/operational guidelines for Edmonton's parks. The UPMP's Parkland Classification includes natural areas as a specific type of park defined as "public, open space specifically designed to preserve natural elements primarily outside of the river valley." Proposed activities within natural area parks are primarily passive (e.g., nature interpretation, nature appreciation, birdwatching, etc.). Natural area parks are part of a much larger connected park system that provides urban dwellers access to nature and various recreational opportunities.

The UPMP document also provides guidelines for natural area acquisition and maintenance; describes requirements regarding buffers, location, access, and configuration; and lists acceptable types of development such as trails, signage, and park furniture. The guiding principle within UPMP with respect to natural areas is the continued commitment to achieving a healthy balance between the provision of recreational experiences and nature preservation.

Corporate Tree Management Policy (C-456A)

In May of 2012, City Council adopted the Corporate Tree Management Policy C-456A. The purpose of this policy is to protect Edmonton's tree canopy, including all ornamental trees and natural treed areas on City property will be procured, maintained, protected and preserved by the City. Where damage to or loss of City trees occurs, as a result of noncompliance to City Guidelines, equitable compensation for that loss will be recovered from the civic or private entity causing the damage or loss and applied to future tree replacements.

Ribbon of Green Concept Plan and Master Plan

The Ribbon of Green Concept Plan presents “a collective public vision for the River Valley” and establishes the framework for the Master Plan. The Master Plan establishes policy guidelines for the “long-term development, use and care of the entire valley.” The plan also identifies Preservation, Conservation and Extensive Use management zones within the River Valley that are based on an analysis of biophysical resources. Suitable recreation activities, construction practices, and management practices within each of these three zones are also identified in the plan.

The Ribbon of Green Plans and UPMP together provide the overall direction for policy, planning, and design considerations of public park spaces both in the River Valley and tablelands, including natural areas.

Urban Forest Management Plan

The Urban Forest Management Plan (UFMP) aims to provide information on current conditions of the urban forest to help better manage existing and future green infrastructure within the City. The UFMP was approved by Council in 2012 and sets out a clear management framework for the protection and enhancement of both planted trees and natural stands.

Development Setbacks from River Valley/Ravine Crests (Policy C-542)

Since 1985, the City of Edmonton has had a city-wide policy governing development within a narrow strip of upland along the crest of the city’s River Valley and Ravines. According to the policy, the City has used top-of-the-bank roadways, public walkways and development setbacks to separate urban development from the “top of bank.”

The City recently approved an update to the Top of Bank Policy to include such considerations as development impact, risk management, accessibility and environmental services. Perhaps most relevant to the protection of biodiversity, the new policy aims to:

“Ensure preservation of the River Valley and Ravine System as a significant visual and natural amenity feature, contributor to the ecological functionality of the City’s natural areas system, and recreational opportunity for the citizens of Edmonton.”

The revised policy will be enforced by the City of Edmonton’s Development Compliance branch.

North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188)

The North Saskatchewan River Valley Area Redevelopment Plan (NSRVARP) protects the North Saskatchewan River Valley and Ravine System as part of Edmonton’s valuable open space heritage for recreation and conservation purposes. It also establishes the principles for future implementation plans and programs for parks development and the retention of the designated residential areas of Rosedale and Cloverdale.

- North Saskatchewan River Valley and Ravines System Protection Overlay: Provides a development setback from the North Saskatchewan River Valley and Ravine System.

Zoning Bylaw (Bylaw 12800)

The City’s Zoning Bylaw contains the rules and regulations for the development of land in the City of Edmonton. It also identifies permitted and discretionary uses within each of the City’s land use zones. Zoning pertinent to natural areas includes the following:

- Natural Areas Protection Zone (NA): Allows for the conservation, preservation and restoration of identified natural areas, features and ecological processes.
- Metropolitan Recreation Zone (A): Preserves natural areas and parkland along the river, creeks, ravines and other designated areas for active and passive recreational uses and environmental protection.
- Public Parks Zone (AP): Provides an area of public land for active and passive recreational uses.

Parkland Bylaw (Bylaw 2202)

The Parkland Bylaw regulates the conduct and activities of people on parkland in order to promote the safe, enjoyable and reasonable use of such property and to protect and preserve natural ecosystems for the benefit of all citizens of the City.

Community Standards Bylaw (Bylaw 14600)

The Community Standards Bylaw regulates the conduct and maintenance of private property, and requires owners to keep premises mown and tidy. This bylaw also regulates the removal, pruning and disposal of elm trees within the city.

Transforming Edmonton

The City of Edmonton has recently developed a new City Vision and Strategic Plan that provides a creative description of Edmonton's future that will help set direction, guide decisions and align city priorities. City Council's vision is supported by several new and upcoming plans that guide how the city's administration will work towards change and improvements. Many of these plans provide direction for Edmonton's ongoing environmental sustainability and leadership. The following plans have recently been completed or are currently being developed:

- **The Way Ahead** — Edmonton's 10-year strategic plan (completed)
- **The Way We Grow** — Edmonton's 10-year municipal development plan (completed)
- **The Way We Move** — Edmonton's 10-year transportation master plan (completed)
- **The Way We Live** — Edmonton's people plan (completed)
- **The Way We Green** — Edmonton's environmental strategic plan (completed)
- **The Way We Finance** — Edmonton's financial sustainability plan (under development)
- **The Way We Prosper** — Edmonton's economic development plan (completed)

2.2.2 — Government of Alberta (Provincial)

Environmental Protection and Prevention Act

The purpose of this Act is to support and promote the protection, enhancement and wise use of the environment.

Water Act

The Alberta Water Act deals with the management and protection of Alberta's water. The Act states that the Crown owns all of the water in Alberta, and that approval from the Province must be obtained for the alteration of drainage patterns. It also requires a license for water withdrawals. Compensation for the drainage, infilling and/or alteration of wetlands is also controlled through the Water Act and associated Interim Provincial Wetland Policy. This policy provides objectives (in order of decreasing preference) to avoid, minimize, and compensate for impacts to wetlands in the province.

Public Lands Act

The Public Lands Act deals with the selling and transfer of public land. The Act states that the Crown owns the bed and shore of all permanent and naturally-occurring water bodies in Alberta.

Weed Control Act

The Alberta Weed Control Act recognizes two classes of weeds — noxious and prohibited noxious — and outlines regulations to ensure they are not introduced to Alberta, or do not spread if they are already present. Prohibited noxious weeds are generally found in very few locations in Alberta. Where they are discovered, "destruction" of these weeds is required. Noxious weeds are already well-established in many parts of the province and must be "controlled" where identified as problematic.

The City has limited authority to change or upgrade weed designation/status within a municipal bylaw. However, approval to do so is required from the Province.

Wildlife Act

Alberta's Wildlife Act governs the management of wildlife as a Crown resource. It addresses the conservation of species at risk (endangered and threatened), including the designation of species and the development of recovery plans for their management.

Municipal Government Act (MGA)

The Municipal Government Act forms the legal basis for the way local governments in cities, towns, villages and rural areas operate in Alberta. The MGA gives municipalities responsibility for land use planning within their boundaries and requires that each municipality create a Municipal Development Plan (MDP), which outlines policies for land use for the entire municipality.

The MGA also grants to municipalities the power to designate lands as Municipal and Environmental Reserve. Upon subdivision, the owner of a parcel of land must provide to the City, without compensation, Municipal Reserve (MR) lands equal to 10 per cent of the total developable land area to be used as public park, public recreation area, schools or to separate lands used for other purposes. Environmental Reserve can also be taken at this time, and includes gullies, swamps, ravines, coulees or natural drainage courses; unstable lands or lands subject to flooding; and buffers for the purpose of pollution prevention and/or public access.

2.2.3 — Government of Canada (Federal)

Migratory Birds Convention Act

Most migratory birds in Canada are protected under the Migratory Birds Convention Act (MBCA), which fulfils the terms of the 1916 Migratory Birds Convention between Canada and the United States. The Act grants the Canadian government the authority to pass and enforce regulations to protect the species of birds included in the Convention, and their nests and eggs. To this end, the Act requires that a permit be obtained for the hunting or trafficking of the birds identified. The Act does not, however, ensure protection of bird habitat, which is addressed through the more stringent requirements of the Canada Wildlife Act. Restricted time periods are identified in the MBCA Act which stipulates that clearing of trees and vegetation shall not be conducted between April 15 and July 31 to avoid impacts to nesting migratory birds. If maintenance activities with the potential to disturb or destroy migratory bird nests must be conducted within this time window, a survey must be conducted by a qualified professional. Associated permits may also be required.



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Canada Wildlife Act

The Canada Wildlife Act allows for the creation, management and protection of wildlife areas for wildlife research activities, or for conservation or interpretation of wildlife. The purpose of wildlife areas is to preserve habitats that are critical to migratory birds and other wildlife species, particularly those that are at risk.

Fisheries Act

The Fisheries Act, administered by the Department of Fisheries and Oceans (DFO), regulates the protection of fish and fish habitat, pollution prevention, the harvesting of fish and the safe use of fish. The Act prohibits any work or undertaking that results in the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat, without authorization from DFO. It also prohibits the deposition of any “deleterious substance” — including silt and sediment — in water frequented by fish, or in any place where such a substance could enter such water.



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3.0 EDMONTON'S BIOPHYSICAL SETTING

Edmonton's urban landscape is strongly influenced by its natural features. The North Saskatchewan River Valley and Ravine System stretches through the centre of the city, and treestands and wetlands dot the tablelands. The plants and wildlife found in these natural habitats are determined by Edmonton's biophysical conditions, including climate, soils, geology and hydrology. Effective management of natural areas requires an understanding of these underlying forces.



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3.1 THE BIOPHYSICAL ENVIRONMENT

3.1.1 — Climate

Edmonton has a dry northern continental climate characterized by warm summers, long, cold winters, and moderate precipitation throughout the year. The city's weather is influenced by cold Arctic air masses flowing southward in the winter and mild and moist air masses originating from the Pacific in the summer. The Rocky Mountains also play a role in determining prevailing weather conditions in the Edmonton area, particularly in summer months (Vickers *et al.* 2001).

Average daily temperatures in the Edmonton area range from -11.7°C in January to 17.5°C in July (measured at the Edmonton City Centre Airport). Extreme temperatures are common, with an average of 28 days below -20°C and an average of 3 days above 30°C . The Edmonton metropolitan area produces a "heat island" effect, with annual temperatures considerably higher than those observed in surrounding rural areas. The city enjoys an



PHOTO COURTESY OF CITY OF EDMONTON

average of 140 frost free days every year, from early May to late September.

Yearly precipitation values are somewhat variable in the Edmonton Capital Region. Values in the area range from 466.3 mm at Edmonton Namao to 536.0 mm at Edmonton Stony Plain. Precipitation is highest in summer months with a maximum average value of 91.7 mm in July. Most of Edmonton's precipitation falls as rain rather than snow, with the lowest monthly precipitation occurring in winter months.

Overall, Edmonton's cold, dry climate and limited growing season favour hardy, well-adapted plants and animals. Still, no matter how well adapted, natural areas are vulnerable to extreme weather events such as droughts, floods, spring snows, and windstorms, as well as the ongoing and future impacts of climate change.

3.1.2 — Soils and Geology

Both the topography and biodiversity of Edmonton's present day landscape were heavily influenced by glaciation. As the glaciers retreated, Edmonton's landscape became littered with large areas of debris-covered stagnant ice between large meltwater lakes. Areas covered by this stagnant ice left moraine deposits, resulting in a hilly or "hummocky" terrain, including knobs, kettles and ridges.

The largest meltwater lake, Glacial Lake Edmonton, was formed by the temporary damming of meltwater by the glacier itself. Glacial Lake Edmonton was very widespread but relatively shallow and probably not in existence for more than 100 years. However, it, too, has had a significant impact on Edmonton's landscape. Most of Edmonton was under Glacial Lake Edmonton, and the resulting silt and clay deposits produced Edmonton's gently undulating terrain and fertile soil. In fact, Edmonton contains some of the most productive agricultural lands in Alberta. As this lake drained, the present day course of the North Saskatchewan River was established — about 6,600 years ago.

Today, the forested slopes and valleys along the North Saskatchewan River and Ravines are vulnerable to erosion and bank failure due to trail misuse, run-off, natural weathering of the fine soil, and undercutting by the river and its tributaries. This landscape is constantly changing as soils shift from one area to another, and effort is required to protect sensitive ecosystems from the impacts of erosion.

3.1.3 — Hydrology

The North Saskatchewan River Valley and Ravine System is the most prominent hydrological feature within the City of Edmonton. The river winds its way through the city from Devon in the southwest to Fort Saskatchewan in the northeast, over a distance of nearly 50 km. Tributary to the North Saskatchewan River are many creeks and streams that drain areas adjacent to the major River Valley system. These include the Wedgewood, Whitemud, Blackmud, Mill, Fulton, Goldbar, Cloverbar and Horsehills Creeks as well as numerous other smaller streams. Pre-glacial buried valleys link underground with the region's rivers and streams. These underground valleys contain high amounts of groundwater and form significant aquifers underneath the city.

Edmonton's fine, clay-loam soil texture and variable topography have led to the formation of many wetlands, as well as several permanent water bodies that were created during post-glacial events (e.g., Big Lake, Kinokamau Lake, Moran Lake). Water levels in these wetlands and permanent water bodies can be extremely variable and depend greatly on annual precipitation and fluctuations in groundwater levels.

3.2 ECOLOGY OF THE EDMONTON LANDSCAPE

Edmonton lies in the Central Parkland Natural Subregion, which is a subset of the larger Aspen Parkland Ecoregion. The Central Parkland Natural Subregion consists of over 50,000 square kilometres located in central Alberta extending north from Calgary, through Edmonton and east to the Alberta-Saskatchewan border. The majority of the Central Parkland Subregion is cultivated; however, a mosaic of deciduous forest, native grassland, and wetland communities occurs in remaining natural parkland areas. In the northwestern parts of the subregion, aspen forest is dominant, with grasslands restricted to drier areas. Edmonton is located near the northwestern boundary of the Central Parkland Natural Subregion and lies directly south and east of the Boreal Forest Ecoregion (Low Boreal Mixedwood Subregion). Thus Edmonton lies within a transition zone between the two Ecoregions and aspects of both the Aspen Parkland and Boreal Forest Ecoregions are common throughout the area.

Edmonton, along with its adjacent municipalities, is the most densely populated part of the Parkland Natural

Region. Today Central Parkland habitat is scarce, with only about 5% of native vegetation remaining. The entire subregion has been heavily influenced by agriculture and urban development, underlining the need for the preservation and management of the remaining natural areas.

3.2.1 — Flora of the Edmonton Area

Native aspen parkland is known for its rich soil and is characterized by aspen and balsam poplar and species-rich understory shrubs. Typical habitats, dictated by local conditions of geology, topography, soils and hydrology, include forested river valley and ravine slopes, riparian habitats, patches of mixedwood boreal forest, deciduous woodlands, small lakes and wetlands, and small areas of grassland, with some remnant sand dune, peatland and shrubland habitats.

As described above, vegetation of the Edmonton area is characteristic of the northern portions of the Central Parkland Subregion intermixed with elements of the Low Boreal Mixedwood Subregion. Within this transition zone, the Edmonton area supports a high diversity of vegetation communities. These areas include: upland aspen, aspen-balsam poplar and white birch deciduous forests, mixedwood aspen-balsam poplar-white spruce forest, white spruce and white spruce-black spruce coniferous stands, black spruce-tamarack peatlands, and various shrubland and wetland vegetation complexes associated with stream channels, moist depressional sites, small sloughs and lake margins (Geowest 1993 & 1999). A more extensive and diverse understory is also able to flourish in the Edmonton area due to increased moisture compared to southern areas where grasslands are more dominant.

Wetland communities are among the most biologically diverse sites within the city. A range of wetland types are present in the Edmonton area including ephemeral depressional sites that retain water for as little as one to two weeks in the spring, intermittent and semi-permanent wetlands, small shallow lakes and sloughs, bogs, fens and several large lakes. Vegetation communities associated with these wetland features generally consist of successional zones of vegetation commonly forming concentric rings around the centre of the wetland or around the shoreline adjacent to open water. Vegetation within these concentric rings progresses from cattail through to bulrush, sedge, reed grass, willow and upland forest with increasing distance from the wetland.

A number of uncommon or rare plant species and communities also exist in the Edmonton area. Species known to occur within the city include flat-topped white aster (*Aster umbellatus*), Canadian rice grass (*Oryzopsis canadensis*), and smooth sweet cicely (*Osmorhiza longistylis*). Other rare or endangered species that occur within 100 km of the city limits may also have the potential to occur in Edmonton if suitable habitat and conditions are available.

More detailed descriptions of Edmonton's vegetation communities are available in publications such as Ealey (1986) and Geowest (1993). Vegetation species lists can also be found in the 2008 City of Edmonton Biodiversity Report (City of Edmonton 2008).

3.2.2 — Fauna of The Edmonton Area

Edmonton's natural areas provide a range of habitats that support a diversity of local wildlife, particularly throughout the North Saskatchewan River Valley and Ravine System. The mature balsam poplar and white spruce forest communities in these areas provide excellent nesting and feeding opportunities, while the younger aspen forest and shrub communities provide further habitat types. The River Valley and Ravine System also provides a significant corridor along which wildlife may disperse and access other natural areas to complete their life cycle requirements.

Nearly 50 species of mammals commonly occur within Edmonton's municipal boundary. Several additional species occur on a very occasional basis, such as grey wolf, black bear, and bushy-tailed woodrat. Urban-adapted mammal species are most common in Edmonton, including brown bats (*Myotis lucifugus*), white-tailed jack rabbit (*Lepus townsendii*) and red squirrel (*Tamiasciurus hudsonicus*) (Geowest 1999). Other species such as white-tailed deer (*Odocoileus virginianus*), beaver (*Castor canadensis*) and coyote (*Canis latrans*) commonly occur in the city, particularly in the River Valley. Numerous species of rodent, shrew and weasel (among others) are also common in Edmonton.

Bird species have been well documented within the Edmonton area due in part to the fact that most are active during daylight hours and are thus more readily catalogued. Over half of the nesting bird species in Alberta occur in Edmonton during the breeding season. In all, 73 species of passerine birds (songbirds) and 70 non-passerine species (including waterfowl, raptors, and woodpeckers) nest within the city. Many other species occur in Edmonton as

migrants during part of the year. Big Lake, located along the northwest boundary of the city, has been identified as a globally significant breeding area for resident and migrant bird species (Ealey 1986, BirdLife International 2009). Other areas within the city, including the North Saskatchewan River Valley and Ravine System, are also areas of high bird diversity.

Five amphibian and two reptile species occur in Edmonton. The boreal chorus frog (*Pseudacris maculata*), wood frog (*Rana sylvatica*), and tiger salamander (*Ambystoma tigrinum*) are common in moist sites such as wetlands, wetland-associated upland habitats, and River Valley areas. Other species such as the Canadian toad (*Bufo hemiophrys*), Western toad (*Bufo boreas*), Western plains garter snake (*Thamnophis radix*) and common garter snake (*Thamnophis sirtalis*) are considerably rarer within Edmonton. With the exception of the tiger salamander, these species are provincially listed as Sensitive, At Risk, or May Be at Risk (see Table 3.1).

Edmonton has nearly 30 species of fish that occur almost exclusively in the North Saskatchewan River and in larger lakes such as Big Lake. Most of the smaller water bodies on the tablelands of Edmonton either freeze to the bottom or lose too much oxygen as a result of litter decomposition in the winter to support fish species year-round. Sport fish species such as goldeye (*Hiodon alosoides*), northern pike (*Esox lucius*), walleye (*Sander vitreus*), and sauger (*Sander canadensis*) are common in the North Saskatchewan River, as are coarsefish species, including suckers and minnows such as longnose dace (*Rhinichthys cataractae*), lake chub (*Couesius plumbeus*), and shiners (*Notropis* spp., *Richardsonius balteatus*). Trout rarely occur in the North Saskatchewan River, likely due to the limited availability of suitable habitat. Sensitive fish species include the lake sturgeon (*Acipenser fulvescens*), spoonhead sculpin (*Cottus ricei*), and northern red-belly dace (*Phoxinus eos*).

A large number of invertebrate species also inhabit the Edmonton area and include 188 species of beetles, 66 species of butterfly, 950 species of moths, 34 species of caddisflies, 22 species of dragonflies and damselflies, 450 species of spiders, 36 mosquito species and many others.

Lists and additional descriptions of wildlife species that can be found in Edmonton are provided in the City of Edmonton 2008 Biodiversity Report (City of Edmonton 2008) and other publications such as Ealey (1986) and Geowest (1993). Table 3.1 provides a list of the wildlife species at risk in Edmonton.

TABLE 3.1: EDMONTON'S WILDLIFE SPECIES AT RISK (2010 ALBERTA GENERAL STATUS OF WILDLIFE SPECIES REPORT).

Taxa	Species	Provincial Status
Birds	Peregrine Falcon	At Risk
	American White Pelican	Sensitive
	Bald Eagle	
	Baltimore Oriole	
	Barn Swallow	
	Barred Owl	
	Bay-breasted Warbler	
	Black Tern	
	Black-backed Woodpecker	
	Blackburnian Warbler	
	Black-crowned Night-heron	
	Black-throated Green Warbler	
	Canada Warbler	
	Cape May Warbler	
	Eastern Phoebe	
	Forster's Tern	
	Great Blue Heron	
	Green-winged Teal	
	Horned Grebe	
	Least Flycatcher	
Lesser Scaup		
Northern Harrier		
Northern Pintail		
Osprey		
Pied-billed Grebe		
Pileated Woodpecker		
Purple Martin		
Rusty Blackbird		
Sandhill Crane		
Sora		
Swainson's Hawk		
Western Tanager		
Mammals	Long-tailed Weasel	May be at Risk
	Northern Long-eared Bat	
	Badger	Sensitive
Hoary Bat		
Amphibians	Canadian Toad	May be at Risk
	Western Toad	Sensitive
Reptiles	Western Plains Garter Snake	Sensitive
	Common Garter Snake	
Fish	Lake Sturgeon	At Risk
	Spoonhead Sculpin	May be at Risk
	Northern Red-belly Dace	Sensitive

4.0 MANAGEMENT CHALLENGES IN NATURAL AREAS



PHOTO COURTESY OF CITY OF EDMONTON

Edmonton's River Valley and tableland natural areas have a long history of human use and enjoyment. Aboriginal people first used these areas for hunting and gathering and shared the land with native wildlife such as bison, elk, grizzly bears and wolves. When Europeans settled the area, much of the land was cleared for lumber, fuel and agriculture. Coal, gold, gravel and clay mining followed, particularly within the River Valley.

In more recent years, much of the River Valley has been restored and protected and today many Edmontonians use River Valley parks and the extensive trail system for recreation and leisure. Tableland natural areas offer important opportunities for wildlife viewing, nature appreciation and walking. Still, significant pressures on the River Valley and tableland natural areas threaten the integrity of these sites and require a customized management response.

4.1 LOSS/FRAGMENTATION OF HABITAT

Habitat destruction and fragmentation involve the loss or partial loss of natural areas to residential, commercial and industrial development and associated infrastructure. This is the most significant threat to biodiversity in Edmonton, particularly in the tablelands, where land development decisions and the location of roads have resulted in the steady, piecemeal loss of natural areas. As a result, only isolated fragments of the original ecosystems remain as islands in an otherwise urban landscape. Such fragmentation prevents wildlife movement and seed dispersal and could potentially lead to species extirpation.

4.2 EFFECTS OF INVASIVE SPECIES

Ecosystems depend on a tenuous balance involving a diversity of plants, animals and insects that have evolved in relationship to one another over thousands of years. Human impacts can upset this balance, reducing the resilience of ecosystems and making them more susceptible to invasion by non-native species. Human activities like trade, transportation, agriculture, and horticulture can facilitate the spread of invasive species into native ecosystems. Invasive species often have no natural predators and can spread quickly, choking out native species by dominating available resources.

4.3 EROSION

Erosion of soils and slopes within natural areas, particularly in the River Valley and Ravine System, can have significant impacts on the stability and sustainability of the area. Public safety issues are also of concern where trails are at risk of slumping and washing out. Informal trails, short-cuts and other off-pathway use in natural areas can create conditions that exacerbate erosive processes, putting the natural area at further risk. Erosion can also lead to sedimentation of water bodies, with harmful ecosystem effects.

4.4 EFFECTS OF HUMAN USE

Creation of informal trails by walking or cycling off designated trails

Informal trails created by pedestrians or cyclists can significantly impact a natural area. They can threaten rare or sensitive plant and wildlife species, spread weeds, compact soils, fragment critical habitat, and cause slope erosion. Management activities like trail rehabilitation, fencing, and educational signage can help to protect natural areas from the impact of informal trails.

Encroachment

Encroachment includes such activities as dumping, mowing, planting, and the construction of sheds, fences and other structures in a natural area. The dumping of yard waste and other refuse into natural areas by adjacent landowners can cause harm to natural areas. Yard waste dumped in natural areas can contain the seeds of invasive plants, which, once established, can threaten native plant species. Mowing, planting and construction can also threaten native plant communities, and the wildlife species that depend upon them.

Littering and Vandalism

There is an important but often overlooked link between ecological health and litter control in natural areas. Edmonton's Wildlife Rehabilitation Society regularly cares for wildlife that is ill or injured after consuming or ingesting litter. Litter poses a potential hazard for wildlife because the creature may become entangled in it, be poisoned by it, or be drawn to garbage on a roadway and struck by a car.

Also important is the impact that litter can have on human visitors to a natural area. Damaged, vandalized, or untidy properties may invite further neglect, and can deter people from visiting the site.

Fires

Fire is, in many ecosystems, a natural process that serves important functions. Some tree species have evolved to take advantage of post-fire conditions, and regular fires can contribute to overall forest health. Fire clears deadwood from the forest floor and stimulates regenerative growth, and provides ideal habitat for species that prefer open areas.

However, in an urban context, the proximity of people to natural areas can make it dangerous to allow fires to burn naturally. Ironically, this historical suppression of fire has significantly increased the risk that fire poses to adjacent, human-dominated landscapes, because the build-up of deadwood causes fires to burn hot and spread quickly. This can negatively impact native plant and wildlife species, as well as people living and working in adjacent neighbourhoods. It is important to strike a balance between the ecological benefits of woody debris within a natural area and the risk of excess fuel loading.

Domestic Pets

Public open spaces, including natural areas, provide an excellent and very popular opportunity for pet owners to recreate and exercise with their animals. In fact, designated off-leash areas, particularly those containing a natural area component, attract an increasingly high volume of users. However, pets can pose a threat to native plants and wildlife if not properly managed. It is important that pet owners understand the potential impacts of domestic animals on plants and wildlife (such as killing them directly, competing for food, disturbing habitat, or passing on disease) and exercise responsible behaviour when it comes to caring for their pets. Keeping dogs on a leash except in off-leash areas and making sure outdoor cats wear a bell will help to protect native birds and small mammals. Community members should also be encouraged to find good homes for pets they can't care for and to never abandon them in natural areas.

4.5 HUMAN-WILDLIFE INTERACTIONS

Common sense should guide all interactions with urban wildlife. For the safety of Edmontonians and wildlife, all animals should be admired from a distance and not handled or approached. Wildlife should not be fed, especially species that may become habituated and cause problems in developed areas. Drivers should be on the alert for animals on roadways, particularly in areas where crossing signs indicate frequent animal use.



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5.0 THE NATURAL AREAS MANAGEMENT FRAMEWORK

AS OUTLINED IN SECTION 1.5, THE MANAGEMENT FRAMEWORK SET OUT IN THIS PLAN IS GUIDED BY A SET OF GUIDING PRINCIPLES THAT INFORM AND SUPPORT THE MANAGEMENT OBJECTIVES, STRATEGIES AND OPERATIONAL GUIDELINES THAT FOLLOW.



PHOTO COURTESY OF CITY OF EDMONTON

5.1 GUIDING PRINCIPLES

In managing the natural systems within its boundaries, the City of Edmonton commits to the following guiding principles:

A) Conservation and Restoration

1. To identify existing natural systems early in the planning process (if possible, during Area Structure Plan development).
2. To maintain and restore ecological structure and function and improve the connectivity of Edmonton's ecological network.
3. To maintain and enhance native biodiversity and the populations of native species, and reduce the extent of invasive species.

B) Education

1. To engage Edmontonians of all ages and cultures in learning about the values of local natural areas.
2. To provide Edmontonians with the information they need to make lifestyle decisions that do not negatively impact natural areas.
3. To create learning opportunities through schools, homeowner communities and businesses.

C) Research

1. To work with local academic institutions to provide research opportunities that will lead to an enhanced understanding of local natural systems.
2. To share the results of research widely through the development of formalized means of information storage and dissemination.
3. To make use of research findings in developing an informed adaptive management approach.

D) Stewardship

1. To lead by example, ensuring the understanding and implementation of best practices in stewardship by City staff in all relevant departments.
2. To inspire and empower all Edmontonians to take part in the stewardship of local natural areas, and to lead others in doing so.
3. To partner with local academic institutions, conservation organizations, other local governments, and other orders of government to maximize the effectiveness of the stewardship of local natural areas.

E) Recreation

1. To ensure recreational activities in natural areas are encouraged and supported but managed in a way that minimizes negative ecological impact. Acceptable recreational activities in natural areas are defined within the *Urban Parks Management Plan*.
2. To ensure that the design and construction of recreational infrastructure minimizes any impact to surrounding ecosystems.
3. To provide recreational users of natural areas with the information they need to recreate safely and in a way that reduces their ecological impact.

F) Monitoring

1. To evaluate the effectiveness of management practices through rigorous monitoring techniques.
2. To enlist the support of local academic institutions, conservation organizations and Master Naturalists in implementing monitoring programs.
3. To effectively store and share the results of monitoring activities, and to ensure that these results contribute to an informed adaptive management approach.

G) Design and Aesthetics

1. To develop aesthetically pleasing landscapes that are consistent with surrounding landscapes and that create natural transitions, especially where adjacent parklands and traditionally landscaped areas abut natural areas.
2. To develop future and maintain existing viewpoints and viewsheds to enhance park experiences (e.g. views into and out of the North Saskatchewan River Valley and Ravines).
3. To minimize the impact of development in and around natural areas on ecological structure and function through ecologically-sound design and construction practices, while still allowing for recreational uses.

5.2 MANAGEMENT OBJECTIVES AND STRATEGIES

As described in previous sections, Edmonton's natural areas encompass a variety of habitat types throughout the city. These include the North Saskatchewan River Valley and Ravine System, wetland complexes, tableland forests, and unique features that are otherwise uncommon to the Aspen Parkland ecoregion. As complex and unique as these features are, there are numerous management objectives that apply throughout Edmonton's ecological network.

This section will identify and present the city-wide management objectives common to all of these areas and provide recommended strategies where appropriate. Objectives and strategies are organized according to five main management categories:

1. Vegetation
2. Wildlife and Habitat
3. Safety
4. Hydrology and Water Resources
5. Human Use

It should be noted that these objectives and strategies represent best practice for the management of Edmonton's natural areas. Currently, only some of these objectives and strategies are put into action, as described by the Operational Guidelines (Section 5.3).

The purpose of this section is to provide a collection of standards to help the City achieve continual improvement in its management of natural areas over time.

5.2.1 — Vegetation

Native vegetation within and surrounding natural areas provides critical habitat for a variety of wildlife species and affords a unique recreational experience for the public. Several aspects associated with vegetation in natural areas must be maintained and managed to ensure the continued provision of habitat and publicly accessible spaces. Invasive plant species can seriously affect the sustainability of areas containing native vegetation. Invasive plants spread rapidly and can out-compete and displace native plants, resulting in a decline in biodiversity. The removal of invasive plant species also creates an opportunity to conduct restoration and revegetation activities that can provide a significant benefit to natural areas and the city's biodiversity. Many natural areas are also home to sensitive plant species, and management activities that address the protection of these resources are of particular importance.

5.2.1.1 — Vegetation Health and Diversity

1. OBJECTIVE: Maintain existing zones and composition of vegetation (including buffer zones) to enhance vegetative structure and overall species diversity.

STRATEGIES:

- a. In general, adopt a minimum intervention approach to vegetation management. Natural treestands and wetland areas shall be allowed to undergo natural succession and regeneration.
- b. Monitor and maintain the health and diversity of native vegetation within the natural area and surroundings, including invasive vegetation and weed species.
- c. Maintain the natural condition of the buffer zone surrounding the natural area wherever possible (e.g., reduced mowing and/or no-mow zones) in order to provide the required transition between the natural area and surrounding land uses. Emergency and public access must also be accommodated within the buffer zones in designated areas.

2. OBJECTIVE: Monitor and maintain the health of vegetation within the natural area.

STRATEGIES:

- a. Periodically monitor the health of the natural area’s vegetation. Monitoring shall include inspections of general vegetation health, indicators of stress, invasive plant establishment, etc.
- b. Where dead or damaged vegetation as a result of disease or pests is encountered, removal or other control actions shall be conducted to limit the spread of any infestations and to maintain the overall health of the natural area. Integrated pest management and best management practices should be used where appropriate for the control of pests and diseases.

3. OBJECTIVE: Control the establishment and spread of invasive plant species.

STRATEGIES:

- a. Control established noxious and prohibited noxious weed species in accordance with City of Edmonton best management practices and protocols, including integrated pest management approaches where appropriate (also refer to the Alberta Weed Control Act).
- b. Control of invasive plant species in areas of known sensitive species occurrence shall be given priority.

4. OBJECTIVE: Protect sensitive or vulnerable plant species within natural areas.

STRATEGY:

- a. Limit public access in areas that support sensitive species. Appropriate signage should be considered to educate the public about the sensitive nature of these locations. As a last resort, sensitive areas may require fencing (e.g., split-rail fencing) to discourage access.

5.2.1.2 — Understory Assessment

1. OBJECTIVE: Monitor the health of existing zones and composition of native vegetation to enhance plant community structure and species diversity.

STRATEGIES:

- a. Evaluate vegetation growth, vigour, and succession through identification of understory cover types, composition, health, density, diameter, and height.
- b. Identify areas requiring naturalization and native planting (e.g., areas that have undergone active removal of invasive plant species).

2. OBJECTIVE: Monitor the establishment and spread of invasive plant species.

STRATEGY:

- a. Periodically monitor the natural area for the spread of invasive plants.

5.2.1.3 — Understory Planting and Naturalization

1. OBJECTIVE: Increase density and diversity of native plant material to increase ground cover and biodiversity and reduce invasive species establishment.

STRATEGIES:

- a. Ensure a wide variety of vegetation species is maintained within the natural area. Increased diversity of plant species will help to ensure a variety in vegetative structure thereby increasing available habitat types and overall biodiversity.
- b. Native vegetation plantings (shrubs and native seed mixes) should be applied in disturbed areas within the natural area (including the buffer zone and in areas where informal trails have developed) as identified through understory assessments or other natural area monitoring processes. Replanting should mimic surrounding native vegetative structure and should provide a diversity of plant species.
- c. Restoration and replanting efforts should preferentially target areas that contain sensitive species when risks and opportunities are identified.

5.2.1.4 — Brush Clearing

1. **OBJECTIVE:** Remove vegetation that encroaches and/or limits the safe use of formal trails and walks within natural areas while maintaining the ecological health of the natural area.

STRATEGIES:

- a. Limit underbrush clearing and mowing to allow habitat for small mammals, birds, and insects except where accumulations of vegetation pose a risk to public safety or property (e.g., from fire).
- b. Retain fallen dead and understory vegetation where possible. These features provide habitat for wildlife as well as additional substrates for new vegetation development. They also aid in the cycling of nutrients within the natural area.

5.2.1.5 — Viewpoint Maintenance

1. **OBJECTIVE:** Maintain vistas of the river valley and ravines for public enjoyment.

STRATEGY:

- a. Maintain viewing areas such that vegetation is not overgrown and does not obstruct vantage points at key locations.



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5.2.2 — Wildlife and Habitat

Natural areas throughout Edmonton provide numerous habitat types that support a wide variety of species. Wildlife may use an area as a permanent (i.e., year-round residents) or a transitional or temporary habitat (i.e., seasonal residents, migrants, and transient species), and management actions should consider the types of wildlife that may inhabit a specific natural area. The site-specific management guidelines may provide more detail regarding the types of species that are likely to be present within a specific area. The vegetation section above (Section 5.2.1) provides information that is also applicable to this section. However, additional objectives and strategies specific to wildlife and habitat are identified below.

5.2.2.1 — Biodiversity (Flora and Fauna)

1. OBJECTIVE: Maintain a diversity of habitats within the natural area to support a diverse assemblage of vegetation and wildlife species.

STRATEGIES:

- a. Monitor long-term biodiversity trends of flora and fauna in cooperation with scientists, naturalist associations, and members of the community.
- b. When replanting disturbed areas, choose native species that provide food and/or shelter for a variety of mammal, bird and insect species.

2. OBJECTIVE: Where appropriate, limit public access to certain areas within the natural area to provide wildlife-only areas that facilitate increased biodiversity.

STRATEGIES:

- a. Where identified (see *Guidelines for Developing Site-Specific Natural Area Management Plans*), maintain limited public access zones for the purposes of wildlife use and protection.
- b. Develop signage in appropriate locations to educate the public on the value of the natural area and effects of human disturbance on biodiversity.

5.2.2.2 — Habitat Features

1. OBJECTIVE: Maintain identified habitat features within the natural area to support a diverse assemblage of vegetation and wildlife species.

STRATEGIES:

- a. Identify, retain and protect snags, nests, dens, tree cavities, and other habitat features that provide cover and nesting opportunities for wildlife.
- b. Where appropriate, place nest and bat boxes in natural areas to augment available nesting and roosting sites. Types and locations of these features should be based on the species present and the biophysical attributes of the site. Coordination with local stewardship and naturalist groups may provide further site specific information.
- c. Retain cut and downed woody debris within the natural area (unless it poses a safety risk) to enhance available habitat and cover.

2. OBJECTIVE: Minimize impacts to wildlife and habitat features resulting from human disturbances and other activities.

STRATEGIES:

- a. Clearing of brush, tree pruning and other vegetation management activities should not be conducted during the restricted time period of April 15 through July 31 to ensure nesting wildlife are not disturbed. If removal is absolutely necessary during this time period, a survey must be conducted by a qualified environmental professional (e.g., professional biologist) to identify the specific locations of nests so that they may be avoided.
- b. With the exception of designated off-leash areas, pets should be kept on leashes in natural areas in order to limit the disturbance created to wildlife and habitat (also see Section 5.2.3.3).

5.2.2.3 — Invasive Species

1. **OBJECTIVE:** *Maintain natural area health and diversity.*

STRATEGIES:

- a. Monitor and control insect and other invasive populations including plants that represent a significant threat to the health of the natural area.
- b. Utilize best management practices and integrated pest management techniques to control pest populations.

5.2.3 — Safety

The safety of the public and adjacent properties is of paramount importance when managing natural areas. Several aspects associated with public safety are addressed in the following sub-sections.

5.2.3.1 — Hazard Tree Identification and Removal

1. **OBJECTIVE:** *Ensure safety of walking trails and other publicly accessible areas within the natural areas while maintaining the ecological health of the natural area.*

STRATEGIES:

- a. Monitor and manage risks associated with windfall. Remove trees that are dead or are significantly compromised AND that pose a hazard to public and/or property. Retain the lower 3 – 5 m in order to provide additional habitat for cavity nesting species. Cut material should be retained within the natural area except in cases of excessive fuel loading.



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5.2.3.2 — Crime Prevention Through Environmental Design (CPTED)

1. **OBJECTIVE:** *Maintain adequate emergency access to natural areas.*

STRATEGIES:

- a. Provide emergency access within the buffer area surrounding the natural area. Coordination with Fire Rescue Services may be required.
- b. Ensure ongoing accessibility for emergency vehicles and personnel by cleaning identified emergency access areas of large woody material (e.g. shrubs and trees) and other obstructions. Where possible, mowing of these areas should be kept to a minimum.

2. **OBJECTIVE:** *Reduce the risk of crime and associated public safety within and adjacent to natural areas.*

STRATEGY:

- a. Address problem areas identified as risks to public safety within natural areas through application of CPTED (Crime Prevention Through Environmental Design) principles. Consideration should also be had for other natural area management goals outlined in this document.

5.2.3.3 — Unauthorized Activities

1. **OBJECTIVE:** *Monitor and control unauthorized and potentially harmful use of natural areas.*

STRATEGIES:

- a. **Fires in natural areas:** Starting or maintaining a fire within a natural area or buffer area is prohibited. Natural area management staff and members of the public should be encouraged, when they discover past fire activity, to ensure that debris is no longer smoldering and remove or scatter the fire remains to the extent possible if safe to do so. Coordination with the Park Ranger Unit and/or Fire Rescue may be necessary.

- b. **Homeless camps:** Removal of homeless camps is to be conducted in accordance with established protocols. Coordination with the Ranger Unit is required and other City staff and members of the public should be discouraged from entering or disturbing such camps.
- c. **Vandalism:** Replace, as appropriate and feasible, signage and other park infrastructure that has been vandalized.
- d. **Access to sensitive habitats:** Public access to sensitive habitats or wildlife-only zones of the natural area shall be limited. Restoration of informal trails should be conducted and signage should be implemented to discourage unauthorized access to these areas.
- e. **Encroachment:** Monitor and manage encroachment issues such as dumping, mowing, non-native plantings, and construction of fences, sheds, and other structures within the natural area and buffer zones. Public education should be provided to local residents about the effects of these activities on natural areas. Coordination with Parks Planning may be required when addressing encroachment issues.
- f. **Off-leash pets:** While the public is welcome to bring their pets to natural areas, due to potential impacts on vegetation and wildlife, pets should be leashed within natural areas unless the area is specifically designated as an off-leash area.

5.2.3.4 — Fuel Loading

1. **OBJECTIVE:** *Limit the risk of fire within the natural area and the potential for its spread to adjacent properties.*

STRATEGY:

- a. Remove and dispose of woody materials and related combustible materials in and around the natural area (including the buffer zone) that pose a significant fire risk. Clearing of brush and woody debris should only be conducted when significant fire risk is present, as retention of this material helps provide food and shelter for many wildlife species.

5.2.3.5 — Wildlife Management

1. OBJECTIVE: Control and/or manage nuisance wildlife to facilitate public safety within, and enjoyment of, the natural area. Coordination with appropriate authorities (such as Alberta Fish and Wildlife) may be required to manage wildlife.

STRATEGIES:

- a. Control of nuisance wildlife should only be undertaken where significant risk to public safety exists. When necessary, these activities should be conducted by qualified personnel and in a humane manner to reduce harm and/or suffering of the subject animal(s). Live trapping and relocation is the preferred option; however, depending on the specific site conditions, relocation may not be possible. Potential impacts to the relocation site must also be considered.
- b. Maintain the cattail fringe and vegetated buffer surrounding wetland natural areas in order to limit access of geese to shoreline areas. This will help reduce high concentrations of geese within a particular area.
- c. Removal of obstructing debris, created by beaver activity, to prevent flooding or impacts to adjacent trees should only be conducted where the activity results in impediments to drainage and where significant risk to property and/or public safety exists. Potential impacts to downstream areas (e.g., erosion from released water) should be evaluated when considering removal of debris and coordination with Drainage Services may be required.

5.2.4 — Hydrology and Water Resources

The hydrology of an area plays a significant role in determining the types of vegetation present within a natural area as well as the array of wildlife that utilize that space. In order to ensure the sustainability of the natural area — whether it is a wetland or tree stand — the hydrological component must be maintained. This is particularly important during prolonged periods of low precipitation and drought.

The Guidelines for Site-Specific Natural Area Management Plans may also provide additional information about the hydrological requirements of individual natural areas. In general, management of the hydrological regime of the natural area should ensure that adverse conditions are not encountered. Coordination with other departments and/or branches (e.g., Drainage Services) may be required to correct any adverse conditions.

5.2.4.1 — Water Resources

1. OBJECTIVE: Maintain existing hydrological flows to ensure the sustainability of the natural area (e.g., wetland, tree stand, etc). The site-specific management guidelines may provide additional site-specific considerations that need to be addressed to ensure hydrological conditions are sustained.

STRATEGY:

- a. Monitor for adequate drainage of natural areas for ponding and flood risk, particularly after significant storm events.

2. OBJECTIVE: Maintain water quality at wetland natural areas.

STRATEGIES:

- a. Herbicides and pesticides for the management of invasive species and pests are to be used as a last resort, particularly near wetlands where these chemicals may have significant detrimental effects to aquatic habitats.
- b. Maintain the vegetated buffer around wetlands. Grasses, shrubs and other native plants should be left in a natural state to the extent possible. Restoration of disturbed areas with native species should be conducted to limit exposed/non-vegetated areas.

5.2.5 — Human Use

Natural areas provide many ecological services and are home to a wide range of plant and wildlife species. They are also part of the City of Edmonton's park system and as such should be readily accessible for public enjoyment. Natural areas provide an excellent opportunity for nature appreciation, walking/hiking, and other forms of recreation. However, a balance must be maintained between recreational and conservation goals. The following provides management objectives and strategies pertaining to public use of natural areas within Edmonton.

5.2.5.1 — Trail Maintenance

- 1. OBJECTIVE: Ensure infrastructure (including trails) associated with natural areas is kept in good repair and is safe for public use.**

STRATEGY:

- Ensure formal trails are safe for public use.

- 2. OBJECTIVE: Encourage the use of formal trails and actively manage and restore areas where informal trails are created.**

STRATEGIES:

- Clearly identify formal trail systems. Way-finding signage should be provided to facilitate the public's use of the formal trail system.
- Actively restore areas where informal trails have been developed by planting native plant material to block access points (see also Section 5.2.1.3).

5.2.5.2 — Infrastructure Maintenance

- 1. OBJECTIVE: Ensure infrastructure associated with natural areas is kept in good repair and is safe for public use.**

STRATEGY:

- Identify and repair/replace broken and/or damaged benches, garbage receptacles, signs, interpretive displays, etc.

5.2.5.3 — Litter, Debris and Waste

- 1. OBJECTIVE: Control and manage the accumulation of human-created debris and litter within the natural area.**

STRATEGIES:

- Observe and regularly remove windblown or discarded litter, debris and other waste material from within the natural area to maintain the aesthetic value of the natural area and reduce potential harm to wildlife (e.g., ingestion of litter by birds).
- To reduce disturbance to wildlife, conduct clean-up activities outside of the nesting/breeding period (e.g., before April 15 and after July 31).

5.2.6 — Education

Public understanding of the value and sensitivities associated with urban natural areas is critical to their protection. This education can happen in different ways — through signage, printed and web-based information, or through hands-on involvement in stewardship. The information should identify how the community can help to maintain these areas in a manner that facilitates the enjoyment of natural areas by the public. The following provides a set of items that should be considered for public education and community outreach efforts. More information on public education and involvement is provided in the Community Stewardship Strategy (Section 6.0).

5.2.6.1 — Education and Awareness

- 1. OBJECTIVE: Increase City staff and public awareness of native ecosystems, ecological services and the benefits of natural areas.**

STRATEGIES:

- Engage City staff and the public through outreach, programming and public service announcements. Outreach programs and information should utilize community groups, school programs, and other partners where appropriate.
- Provide information (e.g., signage, outreach, etc.) regarding areas where sensitive species or wildlife-only areas may be present.

2. OBJECTIVE: Provide specifically targeted information and education to address concerns and problems in natural areas. These may include the following:

STRATEGIES:

- a. Fertilizer use: Inform local residents about the potentially harmful effects of fertilizer use on aquatic ecosystems.
- b. Encroachment: Inform the public about the impacts of encroachment (see also Section 5.2.3.3).
- c. Off-leash pets: Provide appropriate signage and information to limit the impacts of off-leash pets on natural areas. Information identifying the rationale for excluding off-leash pets should also be provided.
- d. Informal trail development: Inform the public about the impacts of off-trail activities. Signage should be provided to encourage use of formal trails.
- e. Other unauthorized activities: Inform the public about the potential impacts that unauthorized activities may have on the sustainability and overall health of the natural area.

5.3 OPERATIONAL GUIDELINES

This section details the operational guidelines that are central to the on-the-ground implementation of Edmonton’s City-Wide Natural Area Management Plan by the operational sections of the City of Edmonton and various public support groups. These guidelines identify the roles, responsibilities, and preliminary schedules associated with the management of River Valley and Ravine System, and tableland natural areas within the City of Edmonton, and have been categorized based on the overall management objectives and strategies articulated in Section 5.2. Schedules will be further defined and updated through implementation of the operational guidelines and discussion with applicable staff.

The guidelines identify the City section best suited to act as the “Action Lead” based on current work plans and/or expertise for any given task and those sections best suited to provide “Action Support” in the form of specialized equipment, additional manpower, or other resources. The “Action Lead” group will manage the identified task as well as decide and articulate when and where additional groups are to be brought in for support. The “Trigger Mechanism” noted in each guideline describes the conditions that would trigger the need for additional support. Customer request protocols already developed for each of the identified sections remain unchanged.



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Figure 5.1 shows how the objectives of the city-wide management approach are related with strategies and operational guidelines in order to ensure that on-the-ground management action is linked to higher level objectives and strategies within the management plan framework.

As noted previously, not all of the management strategies listed in Section 5.2 currently have associated operational guidelines, as reflected in existing management practices. Over time, as management procedures, protocols, and techniques are updated, expanded or changed, the guidelines will be modified to incorporate new information.

As a result, the management plan is intended to be a “living” document that is adaptive and will be more effective in addressing and meeting current and new challenges facing Edmonton’s natural area network.

A summary of the operational guidelines and associated responsibilities is provided in Table 5.1. The table and guidelines have been colour-coded based on operational group for easy reference (Figure 5.2). A further summary of the guidelines is provided on pg. 31, which breaks down the operational guidelines by specific section or group. Maps of managed Natural Areas in each operational district can be found in Appendix B.

FIGURE 5.1: RELATIONSHIP BETWEEN OBJECTIVES, STRATEGIES AND OPERATIONAL GUIDELINES.



FIGURE 5.2: REFERENCE LEGEND FOR COLOUR-CODED GUIDELINES BASED ON OPERATIONAL GROUP.

- | | |
|---|--|
| All Sections | Beautification and OMC Nursery |
| Horticulture and Turf Management | River Valley Parks and Trails |
| Parks Servicing | Park Rangers |
| Vegetation Management | Integrated Pest Management |
| Tree Maintenance | Master Naturalists and Other Volunteer Groups |
| Forestry Policy and Contracts | Office of Biodiversity |
| ✱ Other (Landscape Design and Construction and Parks Planning) | |

TABLE 5.1: OPERATIONAL RESPONSIBILITIES, ACTIONS AND SCHEDULES

GUIDELINE		OPERATIONAL RESPONSIBILITIES										SCHEDULE ¹		
		HORTICULTURE AND TURF MANAGEMENT	PARKS SERVICING	VEGETATION MANAGEMENT	TREE MAINTENANCE	FORESTRY POLICY AND CONTRACTS	BEAUTIFICATION AND OMC NURSERY	RIVER VALLEY PARKS AND TRAILS	PARK RANGERS	INTEGRATED PEST MANAGEMENT	MASTER NATURALISTS AND OTHER VOLUNTEER GROUPS		OFFICE OF BIODIVERSITY	
		NP&CR					CRF	CSB	UP&E					
5.3.1	VEGETATION													
5.3.1.1	Vegetation Health and Diversity			●		○						○	ASSESSMENT CRITERIA CURRENTLY UNDER DEVELOPMENT	
5.3.1.2	Understory Assessment					●						○	ASSESSMENT CRITERIA CURRENTLY UNDER DEVELOPMENT	
5.3.1.3	Understory Planting and Naturalization							●				○	1 naturalization project per year or as determined by understory assessment or stewardship group request	
5.3.1.4	Brush Clearing	○				○	●		●				River Valley - Annually Tablelands - 5 sites per year (based on understory assessment)	
5.3.1.5	Viewpoint Maintenance	○	○	○	○	○	●	○	○	○		○	5 formal viewpoints per year	
5.3.2	WILDLIFE AND HABITAT													
5.3.2.1	Biodiversity (Flora and Fauna)											○	●	1 visit per site per 3 year period
5.3.2.2	Habitat Features											○	●	Constructed features - 1 visit per site per 3 year period
5.3.2.3	Invasive Pest Species										○	●		7 sites per year - includes 1 wetland site (minimum; additional sites for mosquito control may be required)
5.3.3	SAFETY													
5.3.3.1	Hazard Tree Identification and Removal					○	●		○			○		10 sites per year
5.3.3.2	Crime Prevention Through Environmental Design (CPTED)	○	○	○	○	○	●	○	○	○		○		As requested by Community Services (4 sites per year, on average)
5.3.3.3	Unauthorized Activities	○	○	○	○	○	○	○	○	●	○	○		1 visit per site per year
5.3.3.4	Fuel Load Assessment and Reduction	○				○	●		○			○		5 sites per year
5.3.3.5	Wildlife Management	○	○	○	○	○	○	○	○	●	○		○	As reported / required / identified
5.3.4	HYDROLOGY AND WATER RESOURCES													
5.3.4.1	Water Resources								●		●	○		Monitored annually (3 remediations per year, on average)
5.3.5	HUMAN USE													
5.3.5.1	Trail Maintenance	○		○		○			○	●	○			Ongoing daily or as required (all formal trails inspected once per year minimum)
5.3.5.2	Infrastructure Maintenance	○	●	○	○	○	○	○	○	○		○		1 visit per site per year
5.3.5.3	Litter, Debris and Waste	●		○						○	○			Garbage recepticals on a weekly basis RV - trail margins during day to day activities Tablelands - NA margins (during mowing)
5.3.6	EDUCATION													
5.3.6.1	Education and Awareness	○	○	○	○	○	○	○	○	○	○	○	○	Ongoing

- Represents Action Lead
- Represents Action Support
- NP&CR - Neighbourhoods, Parks and Community Recreation Branch
- CRF - Community and Recreation Facilities Branch
- CSB - Community Standards Branch
- UP&E - Urban Planning and Environment Branch

Footnotes:
¹ Schedules based on current operational practices. Changes / updates will be made based on future resource allocation and available manpower. Schedules will be reviewed on an approximately annual basis.

SUMMARY OF OPERATIONAL GUIDELINES: ROLES AND RESPONSIBILITIES

The below list summarizes the operational guidelines that pertain to each Parks branch section and community group identified in this management plan. 'Lead' or 'Support' denotes the group's level of involvement for each guideline. Please refer to the specific guidelines for full details of each party's responsibilities.

All Sections

Support:

- Guideline 5.3.1.5 — Viewpoint Maintenance
- Guideline 5.3.3.2 — Crime Prevention Through Environmental Design (CPTED)
- Guideline 5.3.3.3 — Unauthorized Activity
- Guideline 5.3.3.5 — Wildlife Management
- Guideline 5.3.5.2 — Infrastructure Maintenance
- Guideline 5.3.6.1 — Education and Awareness

Horticulture and Turf Management

Lead:

- Guideline 5.3.5.3 — Litter, Debris and Waste

Support:

- Guideline 5.3.1.4 — Brush Clearing
- Guideline 5.3.3.4 — Fuel Load Assessment and Reduction
- Guideline 5.3.5.1 — Trail Maintenance

Parks Servicing

Lead:

- Guideline 5.3.5.2 — Infrastructure Maintenance

Vegetation Management

Lead:

- Guideline 5.3.1.1 — Vegetation Health and Diversity

Support:

- Guideline 5.3.5.1 — Trail Maintenance
- Guideline 5.3.5.3 — Litter, Debris and Waste

Tree Maintenance

Support:

- Guideline 5.3.1.4 — Brush Clearing
- Guideline 5.3.1.5 — Viewpoint Maintenance
- Guideline 5.3.3.1 — Hazard Tree Identification and Removal
- Guideline 5.3.3.4 — Fuel Load Assessment and Reduction
- Guideline 5.3.5.1 — Trail Maintenance

Forestry Policy and Contracts:

Lead:

- Guideline 5.3.1.2 — Understory Assessment
- Guideline 5.3.1.4 — Brush Clearing
- Guideline 5.3.1.5 — Viewpoint Maintenance
- Guideline 5.3.3.1 — Hazard Tree Identification and Removal
- Guideline 5.3.3.2 — Crime Prevention Through Environmental Design (CPTED)
- Guideline 5.3.3.4 — Fuel Load Assessment and Reduction

Support:

- Guideline 5.3.1.1 — Vegetation Health and Diversity
- Guideline 5.3.2.3 — Invasive Pest Species

Beautification and Old Man Creek Nursery

Lead:

- Guideline 5.3.1.3 — Understory Planting and Naturalization
- Guideline 5.3.6.1 — Education and Awareness

Support:

- Guideline 5.3.1.3 — Understory Planting and Naturalization

River Valley Parks and Trails

Lead:

- Guideline 5.3.1.4 — Brush Clearing
- Guideline 5.3.4.1 — Water Resources
- Guideline 5.3.5.1 — Trail Maintenance
- Guideline 5.3.5.3 — Litter, Debris and Waste

Support:

- Guideline 5.3.1.5 — Viewpoint Maintenance
- Guideline 5.3.3.1 — Hazard Tree Identification and Removal
- Guideline 5.3.3.4 — Fuel Load Assessment and Reduction

Park Rangers

Lead:

- Guideline 5.3.3.3 — Unauthorized Activity
- Guideline 5.3.3.5 — Wildlife Management
- Guideline 5.3.6.1 — Education and Awareness

Support:

- Guideline 5.3.3.2 — Crime Prevention Through Environmental Design (CPTED)
- Guideline 5.3.5.1 — Trail Maintenance
- Guideline 5.3.5.2 — Infrastructure Maintenance

Integrated Pest Management

Lead:

- Guideline 5.3.2.3 — Invasive Pest Species
- Guideline 5.3.4.1 — Water Resources
- Guideline 5.3.6.1 — Education and Awareness

Support:

- Guideline 5.3.3.5 — Wildlife Management
- Guideline 5.3.4.1 — Water Resources

Master Naturalist Program

Support:

- Guideline 5.3.1.1 — Vegetation Health and Diversity
- Guideline 5.3.1.2 — Understory Assessment
- Guideline 5.3.1.3 — Understory Planting and Naturalization
- Guideline 5.3.2.1 — Biodiversity (Flora and Fauna)
- Guideline 5.3.2.2 — Habitat Features
- Guideline 5.3.2.3 — Invasive Pest Species
- Guideline 5.3.3.1 — Hazard Tree Identification and Removal
- Guideline 5.3.3.3 — Unauthorized Activity
- Guideline 5.3.3.4 — Fuel Load Assessment and Reduction
- Guideline 5.3.4.1 — Water Resources
- Guideline 5.3.5.1 — Trail Maintenance
- Guideline 5.3.5.3 — Litter, Debris and Waste
- Guideline 5.3.6.1 — Education and Awareness

Other Volunteer Groups

Support:

- Guideline 5.3.1.1 — Vegetation Health and Diversity
- Guideline 5.3.1.2 — Understory Assessment
- Guideline 5.3.1.3 — Understory Planting and Naturalization
- Guideline 5.3.2.1 — Biodiversity (Flora and Fauna)
- Guideline 5.3.2.2 — Habitat Features

Office of Biodiversity

Lead:

- Guideline 5.3.2.1 — Biodiversity (Flora and Fauna)
- Guideline 5.3.2.2 — Habitat Features
- Guideline 5.3.6.1 — Education and Awareness

Support:

- Guideline 5.3.1.3 — Understory Planting and Naturalization
- Guideline 5.3.5.2 — Infrastructure Maintenance

✿ Landscape Design and Construction

Support:

- Guideline 5.3.5.1 — Trail Maintenance

✿ Parks Planning

Support:

- Guideline 5.3.5.2 — Infrastructure Maintenance

5.3.1 — VEGETATION

GUIDELINE 5.3.1.1 — VEGETATION HEALTH AND DIVERSITY

OBJECTIVE: Maintain health of existing zones and composition of native vegetation to enhance structure and species diversity.

STRATEGY: Monitor and maintain the health and diversity of native vegetation within the natural area and surroundings, including invasive vegetation and weed species.

Action Lead

Vegetation Management

- Monitor for/respond to public complaints about invasive plants.
- Remove/control invasive plants to ensure native diversity/health of native plants is not compromised.
- Control methods include limited use of approved herbicides and mechanical removal methods.
- All herbicide use must conform to current City of Edmonton bylaws/policies and Provincial/Federal legislation.

Trigger Mechanism: Complexity of task, size of material, specialized equipment needs, and available manpower.

Action Support

Forestry Policy and Contracts

- Typically occurs during a site visit to address hazard tree concerns and is based on visual observation and professional judgment.
- Identify and address critical issues/concerns (pest species, disease, weeds, etc) within the surrounding area.
- Focus is currently on stand health and not diversity.
- Identify areas for understory planting opportunities.
- Contact Vegetation Management group for action involving understory areas.

Master Naturalist Program

- Complete plant surveys for specific natural areas, allowing the City to track plant species occurrence and diversity over time.

GUIDELINE 5.3.1.2 — UNDERSTORY ASSESSMENT

OBJECTIVE: Maintain health of existing zones and composition of native vegetation to enhance structure and species diversity.

STRATEGY: Evaluate vegetation growth, vigour, and succession through identification of understory cover types, composition, health, density, diameter, and height.

Action Lead

Forestry Policy and Contracts

- Typically occurs during a site visit to address hazard tree concerns and is based on visual observation and professional judgment.
- Currently not completed on a regular basis. This information is typically collected as part of a “natural stand evaluation” as part of the compensation requirement of the Corporate Tree Policy.

Trigger Mechanism: Available manpower and expertise.

Action Support

Master Naturalist Program

- Could provide support as needed if properly trained by staff.

Other Volunteer Groups

- Could provide support as needed if properly trained by staff.

GUIDELINE 5.3.1.3 — UNDERSTORY PLANTING AND NATURALIZATION

OBJECTIVE: Increase density and diversity of native plant material to increase ground cover and biodiversity.

STRATEGY: Native vegetation plantings should be applied in disturbed areas within the natural area and buffer zone as identified through understory assessments or other monitoring processes. Replanting should mimic surrounding native vegetative structure and diversity.

Action Lead

Beautification/Principal of Horticulture

- Potential sites are identified through professional judgment/evaluation or through stakeholder recommendation. The majority of the time this activity coincides with informal 'wood chip' trail development with community groups.
- Potential sites could be determined through understory assessment (Operational Guideline 5.3.1.2).
- Native plant materials are sourced through the City of Edmonton's Old Man Creek Nursery.
- Project information documented should include site location, species planted, and number planted.
- Each site receives one watering per year.

Trigger Mechanism: As recommended by understory assessments.

Action Support

Old Man Creek Nursery

- Source and/or provide native woody plant material.

Office of Biodiversity

- Liaise with community groups and stakeholders.

Master Naturalist Program

- Provide support as requested by the Office of Biodiversity.

Other Volunteer Groups

- Provide support as requested by the Office of Biodiversity and/or Principal of Horticulture.

GUIDELINE 5.3.1.4 — BRUSH CLEARING

OBJECTIVE: Remove vegetation that encroaches and/or limits the safe use of formal trails and walks within the natural area.

STRATEGY: Limit underbrush clearing and mowing to allow habitat for small mammals, birds and insects (except where fuel loading risks are present).

Action Lead within River Valley and Ravine System

River Valley Parks and Trails

- Remove excess brush that impedes sight lines along "formal" trail edges and/or encroaches on designated gathering areas (e.g. view points, picnic sites, etc.) as per accepted CPTED principles (refer to Operations Guideline 5.3.3.2). Physically remove from site and dispose at appropriately designated location.

Action Lead on Tablelands

Forestry Policy and Contracts

- Remove excess brush that impedes sight lines along "formal" trail edges and/or encroaches on designated gathering areas (i.e. view points, picnic sites, etc.) as per accepted CPTED principles (refer to Operations Guideline 5.3.3.2).
- Work coordinated and managed through external contractor or supporting sections mentioned below.

Trigger Mechanism: Complexity of task, size of material and/or manpower requirement.

Action Support for all areas

Tree Maintenance

- Remove excess brush (larger sized material including trees) and dispose at appropriately designated location or chip material on site and blow into/around stand.

Horticulture and Turf Management

- Physically remove excess brush (shrubs and smaller material) and dispose at appropriately designated location.

Note: Brush clearing should not be conducted between April 15 and July 31 to reduce wildlife disturbance during the breeding/nesting period.

GUIDELINE 5.3.1.5 — VIEWPOINT MAINTENANCE

OBJECTIVE: Maintain vistas of the River Valley and Ravines for public enjoyment.

STRATEGY: Maintain viewing areas such that vegetation is not overgrown and does not obstruct vantage points at key locations.

Action Lead

Forestry Policy and Contracts

- Respond to public inquiries regarding work requests.
- Previous to 2008, limited clearing of viewpoints was accomplished and was determined on a case by case basis.
- Currently, only identified and agreed-upon viewpoints, specific to the North Saskatchewan River Valley, have been actioned.
- Parks Planning is currently addressing and developing a standard or policy to determine which sites will receive treatment, and at what frequency.

Trigger Mechanism: Complexity of task, size of material and/or manpower requirement.

Action Support

Tree Maintenance

- Brush clearing and disposal of larger sized vegetation (i.e., trees).

River Valley Parks and Trails

- Brush clearing of smaller vegetation (i.e., shrubs) and minor maintenance of infrastructure.

All Sections

- All public inquiries regarding the removal and/or pruning of vegetation to improve viewpoint sight lines are to be forwarded to, and verified by, Forestry Policy and Contracts for further action.



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5.3.2 — WILDLIFE AND HABITAT

GUIDELINE 5.3.2.1 — BIODIVERSITY (FLORA AND FAUNA)

OBJECTIVE: Maintain a diversity of habitats within the natural area to support a diverse assemblage of vegetation and wildlife species.

STRATEGY: Monitor long-term biodiversity trends of flora and fauna in cooperation with scientists, naturalist associations, and members of the community.

Action Lead

Office of Biodiversity

- Identify natural areas that do not currently have inventory information, or which are not regularly monitored.
- Develop a methodology (or identify relevant resources) for natural area monitoring, and for biodiversity (plant/wildlife/mycology) inventories.
- Work with staff and community partners to monitor natural areas and complete natural area-specific biodiversity inventories.
- Liaise and explore opportunities with other volunteer groups and academic institutions.
- Compile any information received in a Natural Area Database. (Note: In time, this database should be linked to a GIS system that is accessible to all staff.)
- Compile information attained through development processes (i.e. Site-Specific Natural Area Management Plans, Phase I and II Ecological Network Reports).

Trigger Mechanism: Time constraints and availability/interest of external support groups.

Action Support

Master Naturalists

- Monitor natural areas (either of their own choosing or through consultation with City staff).
- Complete plant/wildlife/mycology surveys for specific natural areas, following appropriate methodology, and (as necessary) with mentorship from key community experts identified during the Master Naturalist Program.
- Submit any information gathered through the above activities to the City for inclusion in the Natural Area Database, and alert the Office of Biodiversity (or appropriate staff) of any concerns.

Other Volunteer Groups

- Complete plant/wildlife/mycology surveys for specific natural areas, and provide related mentorship to Master Naturalists as available and required.

GUIDELINE 5.3.2.2 — HABITAT FEATURES

OBJECTIVE: Maintain identified habitat features within the natural area to support a diverse assemblage of vegetation and wildlife species.

STRATEGY: Identify and protect snags, nests, dens, tree cavities, and other habitat features that provide cover and nesting opportunities for wildlife.

Action Lead

Office of Biodiversity

- Working with Master Naturalists and other community groups, identify key habitat features including, but not limited to, snags, nests, dens, tree cavities, and other habitat features.
- Include a request for this information in monitoring/inventory guidelines for Master Naturalists and other community partners.
- Compile any information received in a Natural Area Database. (Note: In time, this database should be linked to a GIS system that is accessible to all staff.)
- Compile information attained through development processes (i.e., Ecological Network Reports) and recommendations regarding the placement and management of man-made habitat features, including bat boxes, bird houses, and nesting platforms.

Trigger Mechanism: Time constraints and availability/interest of external support groups.

Action Support

Master Naturalists

- As per monitoring/inventory guidelines, make note of key habitat features as described above and submit this information to the Office of Biodiversity on an opportunistic basis.

Other Volunteer Groups

- As per monitoring/inventory guidelines, make note of key habitat features as described above and submit this information to the Office of Biodiversity.



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GUIDELINE 5.3.2.3 — INVASIVE PEST SPECIES

OBJECTIVE: Maintain natural area health and diversity.

STRATEGY: Monitor and control insect pest and other pest populations that represent a significant threat to the health of natural areas.

Action Lead

Integrated Pest Management

Monitoring — Tree Pests

- Insect monitoring through visual observation, pheromone and/or light traps as a means of:
 - Species identification
 - Early detection of invasive and exotic insect species
 - Development of control recommendations

Trigger Mechanism: Requirement for additional manpower and/or resources.

Action Support

Forestry Policy and Contracts

- Identify and provide notification to Action Lead group where invasive pest occurrences exist. Typically occurs during a site visit to address other concerns in the natural area and is based on visual observation and professional judgment.

Master Naturalists

- Identification and reporting of major invasive pest concerns.



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5.3.3 — SAFETY

GUIDELINE 5.3.3.1 — HAZARD TREE IDENTIFICATION AND REMOVAL

OBJECTIVE: Ensure safety of walking trails and other publicly accessible areas while maintaining ecological health of the natural area.

STRATEGY: Remove trees that are dead or are significantly compromised AND pose a hazard to person and/or property, according to the degree of risk and urgency, while maintaining or increasing wildlife habitat.

Action Lead

Forestry Policy and Contracts

Notifications of hazard tree concerns are generally forwarded to Forestry, Beautification and Environmental Management from concerned property owners or members of the public utilizing a particular natural area. An Urban Forester is then dispatched to assess the risk/hazard and recommend a course of action.

- Hazard tree identification
 - Through visual observation and professional judgment, identify all trees within the vicinity that pose a risk to person or property.
 - Ensure a walk-through of the general area is completed to identify any additional hazard trees that need to be removed.
- Habitat trees:
 - Identify hazard trees that are candidates for habitat retention (trees with DBH > 15 cm should be considered for habitat retention, unless the base is compromised).
 - Trees should be topped at varying heights to provide vertical stratification (3-5 m).
 - Lateral branching should be left intact where feasible to provide perching habitat.
- Depending on current fuel load levels within the natural area, dispose of branch and woody material by:
 - Scattering and laying flat branches around area, or
 - Chipping material on site and blowing into/around stand.
- Stem / tree top disposal:
 - Retain stems in large pieces that cannot be removed by hand.

- Tree bolts can be utilized for slope retention, erosion control, and trail construction if required.
- Hazard tree removal process:
 - Follow current Standard Operation Procedures as identified within CoE Parks Hazard Assessment and Control Forms for hazard tree removal.

Trigger Mechanism: Complexity of task, size of material and/or manpower.

Action Support

Tree Maintenance

- Same process as above.

River Valley Parks and Trails

- Same process as above.

Master Naturalists

- Identification and reporting of hazard trees.

GUIDELINE 5.3.3.2 — CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)

OBJECTIVE: Reduce the risk of crime and other inappropriate activities associated with public safety within and adjacent to natural areas.

STRATEGY: Address problem areas within natural areas identified as risks to public safety through application of CPTED principles.

Action Lead

Forestry Policy and Contracts

- All applicable sections within Forestry, Beautification and Environmental Management address potential CPTED concerns specifically regarding inappropriate activities, sight line issues, and encroachment of vegetation within trail/walkway right-of-way.
- Areas of concern are identified through public consultation and reporting to various City agencies and departments.
- Coordinate and manage work with supporting sections, listed below, or external contractors.

Trigger Mechanism: Background information and implementation.

Action Support

Park Rangers

- Address safety concerns associated with CPTED principles specifically regarding inappropriate activities within natural areas.

All Sections

- Provide support through implementation of the recommendations provided through the CPTED evaluation process.

GUIDELINE 5.3.3.3 — UNAUTHORIZED ACTIVITY

OBJECTIVE: Monitor and control unauthorized and potentially harmful use of natural areas.

STRATEGY: Monitor natural areas for inappropriate use and provide corrective action.

Action Lead

Park Rangers

- Typically occurs through notifications from concerned property owners or members of the general public using a natural area, or incidently during a site visit, and is based on visual observation and professional judgment.
- Homeless camps:
 - Monitor, track, and respond to homeless camps and associated activities.
- Identify and monitor inappropriate activities such as:
 - Informal trail development
 - Mountain bike trails and structures
 - Tree forts
 - Fire pits
 - Encroachments onto parkland
 - Vandalism
 - Off-leash pets

Enforcement of Parkland Bylaw 2202

- Regulate the conduct and activities of people on parkland in order to promote the safe, enjoyable and reasonable use of such property and to protect and preserve natural ecosystems for the benefit of all citizens of the City.

Trigger Mechanism: Complexity of task, size of material and/or manpower.

Action Support

All sections

- Report unauthorized activities to the Park Rangers for action and/or provide support as required.

Master Naturalists

- Report to Office of Biodiversity about any unauthorized or potentially harmful use of natural areas identified through monitoring activities.

GUIDELINE 5.3.3.4 — FUEL LOAD ASSESSMENT AND REDUCTION

OBJECTIVE: Limit the risk of fire within Edmonton’s natural areas and the potential for its spread to adjacent properties.

STRATEGY: Remove and dispose of woody materials and related combustible materials that pose a significant fire risk due to high fuel loading.

Action Lead

Forestry Policy and Contracts

- Identify and assess fuel load levels through visual observation and professional judgment, utilizing principles outlined within the Province of Alberta’s Fire Smart document (Partners in Protection 2003).
- Evaluate available resources and prioritize areas to be treated.
- Prescribe treatment to be completed (e.g., raising conifers, tree thinning, understory management, removal and disposal of material, etc.).
- Determine level of support required to adequately address action in an expedient and cost effective manner.
- Delegate tasks to appropriate designated or supporting sections.
- Recognize cost, resource availability, and level of priority to complete work.
- Coordinate external contractors where appropriate.

Trigger Mechanism: Complexity of task, size of material and/or manpower.

Action Support

River Valley Parks and Trails

- Provide support through hand clearing utilizing small power tools, and brush piling and scattering depending on coarse woody debris levels.
- Remove excess coarse woody material (CWM) by physically removing material from site and disposing at an appropriately designated location.

Tree Maintenance

- Remove large trees and dispose large amounts of material utilizing chipper. Material is to be removed from site or scattered throughout the site.
- Remove excess brush by:
 - Physically removing from site and disposing of at appropriately designated location.
 - Chipping material on site and blowing into/ around stand.

Horticulture and Turf Management

- Provide support primarily through manpower and limited use of mechanized hand tools.
- Remove excess brush by removing from site and disposed of at appropriately designated location.

Master Naturalists

- Identify and report excessive fuel loading issues.

GUIDELINE 5.3.3.5 — WILDLIFE MANAGEMENT

OBJECTIVE: Control and/or manage nuisance wildlife to facilitate the public's safety and enjoyment of natural areas.

STRATEGY: Control of nuisance wildlife should only be undertaken where significant risk to public safety exists.

Action Lead

Park Rangers

- Notify, and work in support of, federal and provincial government agencies.

Trigger Mechanism: Type of wildlife encountered and/or level of risk to public

Action Support

Integrated Pest Management

Vertebrate Pest Control

- Vertebrate pests may include beavers, ground squirrels (gophers), coyotes, crows, pigeons, woodchucks, etc.
- Occasionally, control occurs within natural areas. Control of vertebrate pest species should only be undertaken if a direct link between the animal's activity and infrastructure and property damage or public safety has been identified.
- Decision to take action based upon visual observation and professional judgment.

All Sections

- Notify Park Rangers for consultation with federal and provincial government agencies.



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5.3.4 — HYDROLOGY AND WATER RESOURCES

GUIDELINE 5.3.4.1 — WATER RESOURCES

OBJECTIVE: Maintain existing hydrological flows and water quality to ensure the sustainability of the natural area.

STRATEGY: Monitor, record and control water levels within natural areas to ensure their long sustainability.

Action Lead

River Valley Parks and Trails

- Remediate areas that have been damaged by excess water.
- Ensure natural areas receive adequate water to ensure sustainability.
- Report to Drainage Services where appropriate (e.g., drainage infrastructure concerns).

Trigger Mechanism: Complexity of task and/or manpower requirements.

Integrated Pest Management

Mosquito Control

- Aerial and ground pesticide spraying on an annual basis.
- Level of control activities directly related to seasonal mosquito populations.
- Current practice limits spraying to seasonal waterbodies (areas that do not permanently hold water).
- Past practices, particularly during the West Nile Virus threat, included spraying of permanent waterbodies and wetlands.
- Mosquito population monitoring through visual observation, light traps, and pond/water sampling (dipping) as a means to:
 - Identify mosquito species and monitor populations
 - Develop control recommendations

Action Support

Integrated Pest Management

- Action required only if water collects and remains on the landscape for an extended period of time.
- Natural area may require treatment for mosquito control and/or source reduction

Master Naturalists

- Identify and report areas subjected to prolonged flooding.

5.3.5 — HUMAN USE

GUIDELINE 5.3.5.1 — TRAIL MAINTENANCE

OBJECTIVE: Ensure infrastructure associated with natural areas is kept in good repair and is safe for public use.

STRATEGY: Ensure formal trails are safe for public use

Action Lead

River Valley Parks and Trails

- Brush back vegetation along “improved” trails to maintain activities trail width guidelines (Refer to Operations Guideline 5.3.1.4).
- Remove fallen trees and vegetative debris crossing “improved” trails to maintain public safety.
- Install and maintain culverts.
- Address and alleviate water ponding issues (Operations Guideline 5.3.4.1).
- Repair sections of trails that have been washed out including trail relocation and/or realignment resulting from higher than normal water flow.

Trail Maintenance and Clearing

- Brushing back vegetation along “improved” trails to maintain activities trail width guidelines (Refer to Operations Guideline 5.3.1.3).
- Removal of fallen trees and vegetative debris crossing “improved” trails to maintain public safety
- Install and maintain culverts
- Address and alleviate ponding issues (Refer to Operations Guideline 5.3.4.1)
- Repair sections of trails that have been washed out

General Maintenance of Trail Infrastructure

- Viewpoint maintenance (Refer to Operations Guideline 5.3.1.4).
 - Brush clearing and minor maintenance
- Staircase maintenance
 - Brush clearing, pruning, herbicide application, shovelling, minor repairs
- Fence maintenance
 - Brush clearing, pruning, and minor maintenance
- Bollard and gate maintenance
 - Brush clearing, pruning, and minor maintenance

- Signage maintenance (placement/replacement and minor maintenance).
- Graffiti removal
- Trash and garbage removal (Refer to Operations Guideline 5.3.5.4).

Action Support

Tree Maintenance

- Removal of large trees and disposal of increased levels of woody material utilizing mechanical means. Material to be removed from site or scattered throughout, or chip material on site and blow into/around stand.

Integrated Pest Management

Vegetation Management

- Identifies trail sections requiring maintenance while performing other duties within natural areas

Park Rangers

- Identifies trail sections requiring maintenance while performing other duties within the river valley and other natural areas

Horticulture and Turf Management

- Identifies trail sections requiring maintenance while performing other duties within natural areas
- Provides support primarily through man power and limited use of mechanized hand tools.

✳ Landscape Design and Construction

- Trails that require increased levels of repair or upgrading. Involvement to be determined by lead group.

Master Naturalists

- Master Naturalist Program coordinator has had discussions with Park Rangers about involving Master Naturalists in trail monitoring — program yet to be developed.

GUIDELINE 5.3.5.2 — INFRASTRUCTURE MAINTENANCE

OBJECTIVE: Ensure infrastructure associated with natural areas is kept in good repair and is safe for public use.

STRATEGY: Identify, repair, or replace broken and/or damaged benches, garbage receptacles, signs, interpretive displays, etc.

Action Lead

Parks Servicing




- Damaged infrastructure is repaired or replaced in a timely manner based on availability and cost.

Trigger Mechanism: Sites and/or issues are to be identified as they arise through visual assessment.

Action Support

All Sections

- All Parks sections to recognize and report broken or damaged infrastructure.

-  **Park Rangers**
-  **Office of Biodiversity**
-  **Parks Planning**

- Coordinated group to determine signage needs within natural areas including:
 - Way-finding signage
 - Identification signage
 - Interpretive signage

GUIDELINE 5.3.5.3 — LITTER, DEBRIS AND WASTE

OBJECTIVE: Control and manage the accumulation of human-created debris and litter within all natural areas (River Valley and Ravine System, tablelands, viewpoints, etc).

STRATEGY: Observe and regularly remove windblown or discarded litter, debris, and other waste material from within the natural area.

Action Lead within River Valley and Ravines

River Valley Parks and Trails

- River Valley Clean-up
 - Annual volunteer event developed and organized by River Valley Parks and Trails section to clean up litter and garbage disposed of into the NSRV
 - In addition, regular clean-up and disposal of materials discarded into NSRV is carried out as required on an ongoing basis
- North Saskatchewan River Clean-up
 - Removal and disposal of materials discarded into the river itself

Action Lead on tablelands

Horticulture and Turf Management

- Remove debris/garbage as required

Trigger Mechanism: available man power

Action Support for all areas

Integrated Pest Management

Vegetation Management

- Remove debris/garbage as required

Master Naturalists

- Pick up litter as it is encountered during monitoring natural areas.
- Organize clean-up events with communities surrounding natural areas.

Note: Clean up activities should not be conducted between April 15 and July 31 to reduce wildlife disturbance during the breeding/nesting period.

5.3.6 — EDUCATION

GUIDELINE 5.3.6.1 — EDUCATION AND AWARENESS

OBJECTIVE: Increase City staff and public awareness of native ecosystems, ecological services and the benefits of natural areas.

STRATEGY: Engage the public and other City staff through outreach, programming and public service announcements.

Action Lead (to be determined based on nature of task)

Office of Biodiversity

- Annual delivery of the Master Naturalist Program course, and follow-up volunteer support/coordination.
- Public education through public service announcements (PSAs), pamphlets, presentations and participation in community events.
- Stewardship partners with local naturalist societies around the Edmonton area (e.g., Partners in Parks, Edmonton Nature Club, Edmonton Naturalist Group, Evergreen, etc.).
- Education sessions for other City staff on how all branches can contribute to ecological design/biodiversity protection.

Integrated Pest Management

- Public education through PSAs, pamphlets, presentations and participation in community events.
- Partnership with various naturalist societies around the Edmonton area (e.g., Partners in Parks, Edmonton Nature Club, Edmonton Naturalist Group, Evergreen, Wagner Natural Area Society, etc.).

Beautification and OMC Nursery

- Educate and empower community groups to take ownership of natural areas located within their neighbourhoods through the Partners in Parks Program.
- Supply native plant material and direction to community groups involved in naturalization and understory planting activities.

Park Rangers

- Public education about safety and appropriate behaviour in natural areas, wildlife encounters, and the Parks Bylaw through PSAs, pamphlets, presentations and the Lost in the Woods and Parks Patrol/Stewards Programs.

Action Support

All other Sections

- Provide support as needed and in accordance with resource availability.

Master Naturalists

- Deliver presentations to various community groups (at community events, English as a Second Language classes/events, interpretive walks in natural areas, etc.) to share information about the structure, function and value of natural areas.

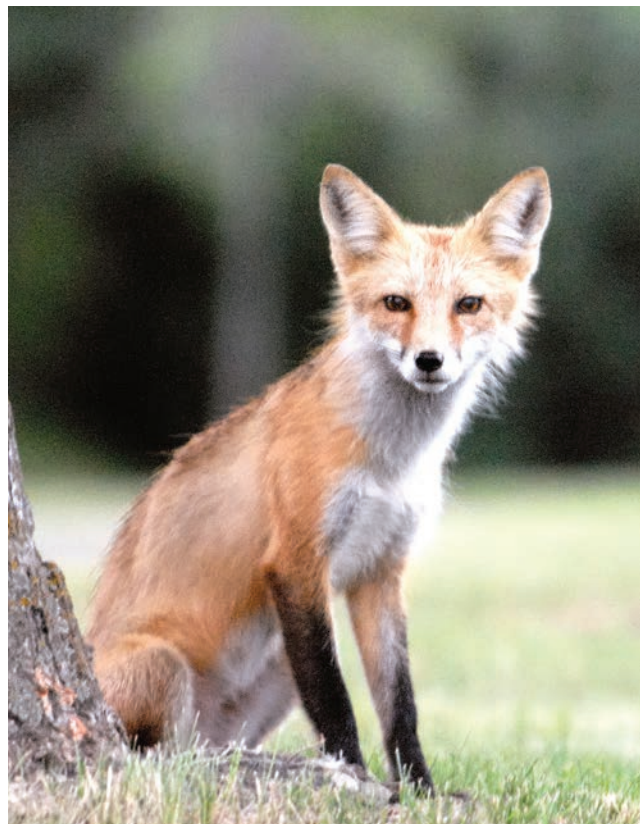


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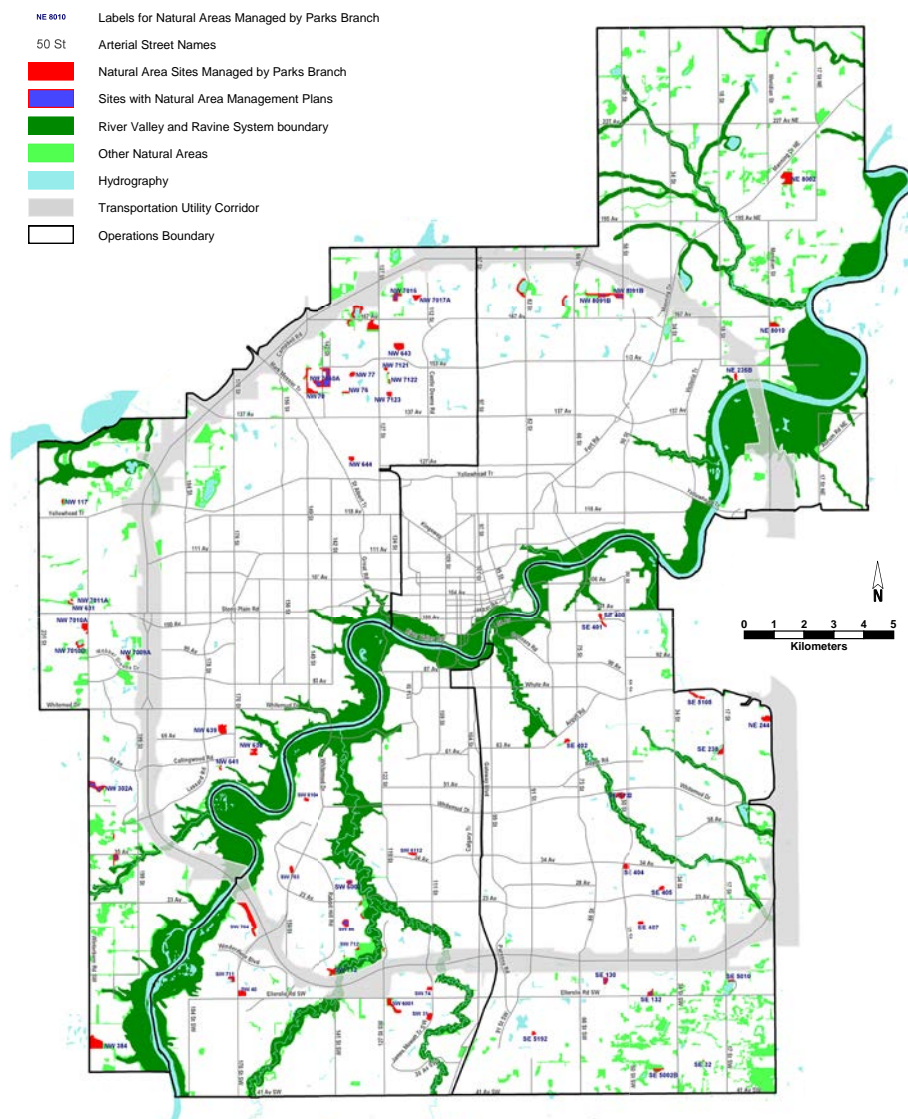
5.4 SITE-SPECIFIC CONDITIONS AND RECOMMENDATIONS

The objectives, strategies and operational guidelines described in this management plan are intended to apply to Edmonton's natural areas system as a whole. They provide general management activities that will help to maintain the ecological function of all of Edmonton's River Valley, Ravine and tableland natural areas.

The Site-Specific Natural Area Management Plan (City of Edmonton 2014) is implemented and replaces the

previously required Natural Area Management Plan (2003). The recommendations provided within each management plan should be applied in addition to the more general operational guidelines as described within this document. Currently, not all natural areas have Site-Specific Management Plans. These will be produced or amended as the City's Natural Area database is created. Map 4.1 illustrates the location of Edmonton's natural areas with site-specific management recommendations.

Map 4.1 shows the location of Edmonton's natural areas with Site-Specific Management Plans.



6.0 COMMUNITY STEWARDSHIP STRATEGY

While the City of Edmonton is responsible for the management of City-owned natural areas in Edmonton, its capacity, knowledge and ability are significantly extended by support from willing community groups. The City is hoping to build on these partnerships in the future and better engage interested Edmontonians in the management of local natural areas. As described within this management plan's operational guidelines, there are many opportunities for community involvement in natural area management. This section provides detail about the current and potential involvement of some of our community partners.

6.1 MASTER NATURALISTS

The City of Edmonton's Master Naturalist Program (MNP) is a learn-and-serve program for adults who are interested in learning more about, and becoming stewards of, Edmonton's natural areas. Each year, approximately 30 people participate in 35-hours of free course work in exchange for 35 hours of volunteer service to become certified Master Naturalists. These volunteers are an extremely valuable resource to the City — knowledgeable, passionate and dedicated ambassadors and stewards who provide much-needed support for the sound management of Edmonton's natural areas.

The role of Master Naturalists within natural areas management is an important one. With their understanding of the internal workings of the City and the challenges faced by staff and managers, coupled with their knowledge of the structure and function of natural areas, these individuals are well-positioned to carry out more complex and challenging natural area management tasks. They can be trusted to speak on behalf of the City to community groups, to carry out ongoing monitoring and inventory work in natural areas, and to lead others in on-the-ground stewardship activities — in short, to enhance the City's capacity for natural area management. Over 153 Master Naturalists are currently involved in these tasks.

6.2 COMMUNITY STEWARDSHIP GROUPS

Increasingly, Edmontonians are interested in playing a role in the stewardship of the natural areas in their neighbourhoods. Since 2009, Master Naturalist Program graduates, with their interest in leading others in this work, have furthered this trend.

In response to this interest, the City has been supporting the development of community stewardship groups, which offers a clear structure and process for community stewardship in a given natural area. Stewardship groups carry out stewardship activities — including site monitoring and clean-up, removal of invasive plants species, naturalization, and nature interpretation for the community — under a City of Edmonton Partners in Parks agreement. This agreement provides clarity for the City and stewardship groups about the activities to be undertaken, and is revisited and revised as necessary on an annual basis.

Community stewardship groups provide stability, longevity and a degree of foresight that would be missing from "one-off" stewardship activities. They bring community members together to consider an overall vision for the management and enhancement of a natural area. They also provide the City with a structure for communication with active community stewards, so that community groups can be kept in the loop on City and contractor activities that could affect the natural area in question. Several groups currently exist — Friends of Kinnaird Ravine, Keepers of Mill Creek, Hodgson Wetland Stewardship Group and Graunke Park Naturalization Committee — with more still in formation.

Conservation Partners

In addition to these community stewardship groups, many other organizations work actively to monitor, conserve and educate the community about local natural areas. Some of these groups are already partners of the City, and others represent an opportunity for future collaboration.

6.2.1 — Academic Institutions

Edmonton's academic institutions, including the University of Alberta, Grant MacEwan University, Northern Alberta Institute of Technology (NAIT), Concordia University College of Alberta and King's College, are important players in the management of Edmonton's natural areas. Their capacity for research into the role and value of natural areas in an urban area, the threats they face, and cutting-edge management approaches provides important information for the City to incorporate into its management of natural areas.

The City will continue to work with academic partners as a means of expanding its management capacity, and also of ensuring that its design of housing, drainage and transportation infrastructure and its management of natural areas maximize the protection of ecological integrity.

6.2.2 — Conservation Organizations

Alberta Invasive Plant Council

The Alberta Invasive Plant Council (AIPC) is an organization focussed on making Albertans aware of the impact of invasive plants, fostering and facilitating cooperation among invasive plant stakeholders, and providing expert advice and guidance to government, industry and the public on invasive plant issues.

The AIPC can play an important role in supporting the City in improved management of invasive plants, and in educating the Edmonton public about these plants and their potential impact. Because many of the invasive plants that threaten Edmonton's natural areas have escaped from backyard gardens, public education and outreach will be an increasingly important focus for the City.

Cows and Fish

Cows and Fish, formally the Alberta Riparian Habitat Management Society, is an organization that strives to foster a better understanding of the value of riparian areas, and how we can manage, protect and restore them.

Cows and Fish is a partner of the City's Master Naturalist Program and has run local riparian assessment and training workshops for Master Naturalists and other community members (e.g. Kinnaird Ravine). This organization is an important partner in educating Edmontonians about riparian protection, management and restoration, and its expertise should be noted as an important resource for the management of riparian areas.

Alberta Mycological Society

The Alberta Mycological Society (AMS) is a volunteer study group whose members are fascinated by fungi. As the only mycological club in Canada's prairie provinces, the AMS provides education to promote an understanding and appreciation of the Kingdom of Fungi. The AMS is a partner of the City's Master Naturalist Program, and members have provided mentorship to Master Naturalists in identifying mushrooms and other fungi in local natural areas.

In the future, the City could partner with AMS to learn more about the mushrooms that grow in local natural areas, the role they play in maintaining an ecological balance, and the management practices that should be undertaken to ensure their protection.

Edmonton Naturalization Group

The Edmonton Naturalization Group (ENG) is a community group committed to growing native plants and promoting their use in gardening and landscaping among the public. ENG volunteers raise native plants at the City's Oldman Creek Nursery, maintain a native plant demonstration bed at the John Janzen Nature Centre, and care for plants in some City of Edmonton parks and natural areas.

The ENG is extremely supportive of community learning about native plants and their use. This organization attends community events throughout year, where members share their knowledge and experience. The ENG is a partner of the City's Master Naturalist Program, and members have provided mentorship to Master Naturalists in identifying and inventorying native and invasive plants in local natural areas. The ENG also propagates native plants on a portion of the Oldman Creek Nursery bed, which the organization has been granted permission to use through an agreement with the City. The native plant beds are entirely managed by volunteers, and the ENG often donates plants for use in naturalization projects on City land.

Edmonton And Area Land Trust

The City of Edmonton is one of six founding organizations of the Edmonton and Area Land Trust (EALT). The EALT is a non-profit, regional land trust, created in 2007. The EALT is dedicated to conserving natural areas in Edmonton and the surrounding areas. The other land trust partners are the Edmonton Community Foundation, Edmonton Nature Club, Legacy Lands Conservation Society, Urban Development Institute, and the Land Stewardship Centre of Canada.

The EALT is vested with the authority to steward natural areas that have been donated to them or for which they have been identified as a caretaker through the creation of a conservation easement. In addition, they are committed to educating Edmontonians and residents of surrounding municipalities about the value of natural areas. As such, they are an important partner in both the protection and public interpretation of natural areas. They also provide the benefit of bringing the six founding organizations together with a shared mandate.

Edmonton Nature Club

The Edmonton Nature Club (ENC), which was created in 2004 from the former Edmonton Bird Club and Edmonton Natural History Club, seeks to develop an awareness of and encourage an interest in the natural environment among its members and the community through meetings, workshops, study groups, field trips and publications. The ENC also supports and promotes the protection of local natural areas.

The ENC is a partner of the City's Master Naturalist Program, and ENC members have given time to mentoring new Master Naturalists in stewarding local natural areas. In addition, the ENC has partnered with the City to develop two bird checklists — one limited to Edmonton, the other focussed on the Alberta Capital Region. The ENC has also provided critical inventory information to the City for various purposes, including information about bird and other wildlife occurrence in natural areas.

This organization is a wonderful partner in educating Edmontonians about natural areas and biodiversity, and holds a wealth of knowledge and expertise.

Evergreen

Evergreen is a Canadian non-profit organization that strives to make cities more liveable by deepening the connection between humans and nature.

Evergreen is a partner of the City's Master Naturalist Program and is working with Master Naturalists on local schoolyard naturalization projects. Evergreen has developed some excellent resources about community building through naturalization that can be shared with Edmontonians.

Wildlife Rehabilitation Society Of Edmonton

The Wildlife Rehabilitation Society of Edmonton (WRSE) is a non-profit, charitable organization that provides compassionate care for injured and orphaned wildlife and promotes understanding and respect for wildlife through education.

The WRSE is a partner of the City's Master Naturalist Program and an important provider of care for injured and orphaned wildlife, which the City is not itself able to provide.

6.3 CITY COMMUNITY CONSERVATION PROGRAMS

6.3.1 — Partners in Parks

The Partners in Parks program enables Edmontonians to become involved in the management of City parks, open spaces and natural areas. Through a Partners in Parks agreement, a community member or group commits to a set of management activities of their choosing, which they agree to take on over the course of a year. After a year, the agreement is revisited by the City and the individuals involved, and revised or allowed to expire, as required.

6.3.2 — Naturescapes

The Naturescapes program is a community/school greening partnership involving Evergreen and the Joint Use Partners (all three school boards in Edmonton). Through this partnership, the City is able to share the many resources that Evergreen brings, coordinate Naturescapes initiatives on school and community grounds, and support greening efforts through workshops. The program encourages a wide range of projects and activities suitable for school and community parkland. These projects include planting native and ornamental plants, providing habitat for a diversity of animal and plant species, and sustaining a healthier environment.

As the City increases its efforts to “green the matrix” (the developed part of the City), the Naturescapes program will continue to be an important tool for the naturalization of community and school open spaces.

6.4 CITIZEN SCIENCE

Given the City’s limited capacity for monitoring and inventory of natural areas, citizen science is a critically important tool. It not only provides the City with important information about local trends in ecological health, it also facilitates community learning and engagement in stewardship. Existing programs such as PlantWatch, FeederWatch, FrogWatch and the Christmas Bird Count all permit community members to submit their observations to local, provincial or national organizations, thus contributing to a growing body of information on each of these topics. Currently, this program is under development.



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7.0 MANAGEMENT PLAN IMPLEMENTATION

The objectives, strategies and operational guidelines detailed in this Plan set the groundwork for the ongoing management of all of Edmonton's protected natural areas. However, the effectiveness of this Plan, and ultimately the ecological health of Edmonton's natural areas, is tied directly to the on-the-ground implementation of the management activities.

Successful translation of this management plan into meaningful action means focussing efforts in four key areas. This section discusses each of these areas and their role in the implementation of this Plan:

- Integration into current practice
- Monitoring
- Reporting
- Continual improvement through adaptive management

7.1 INTEGRATION INTO CURRENT PRACTICE

The creation of this Management Plan is an important first step in better integrating natural areas management into the day-to-day work of City of Edmonton staff. Through interviews with individuals representing the various operational sections involved with natural areas, the City's existing natural areas management practices have been documented and recorded in the Operational Guidelines section of this document. This process has helped raise awareness and encourage discussion among staff about management responsibilities. The compilation of these guidelines into a single management plan provides staff with a central location to access information about natural areas management. Still, further communication, training, and feedback are required to ensure that this Plan is fully integrated into regular City operations.

Established administrative protocols and processes such as the SAP Plant Maintenance System and the City's Environmental Management System (EMS), called Enviso, offer important opportunities to better integrate this Plan with the on-the-ground activities of City staff. SAP can be used to track and monitor management activities, and Enviso provides a framework through which Edmonton's environmental impacts can be controlled and monitored. Staff can receive environmental communication and

training, and the results of specific environmental activities can be audited and reported. The end goal of Enviso is to promote continual improvement within the City of Edmonton with respect to all environmental activities, including natural areas management.

Like this document, the City's Enviso system is constantly evolving, and linkages between the system and this management plan will strengthen with time. Three of the main areas for linkage are monitoring, reporting and fostering continual improvement, as discussed in the next three subsections.

7.2 MONITORING

In order to identify successful practices and areas for improvement within the management framework, a monitoring program must be implemented to measure changes in natural areas over time and the effectiveness of management activities. Monitoring may take various forms, and could include biological inventories, identifying changes in ecological function, measuring the frequency and effectiveness of management activities, and studying the impacts of specific projects, such as formal trail construction. Baseline monitoring efforts will ideally be conducted by City staff, while partnerships and agreements with outside agencies and community groups may be sought to provide an enhanced level of monitoring for specific elements of the natural area system.

Throughout Section 5.0, various monitoring activities are documented within the listed objectives, strategies and operational guidelines. Table 5.1 also provides further information on specific monitoring elements and proposed frequencies which will further be refined in accordance with available resources. A formalized monitoring program with due consideration of resource availability and community support roles is recommended for future development. In the interim, however, the following offers a summary of monitoring elements that should be considered to aid in the implementation of the City's management strategies:

Vegetation

- Monitor overall vegetation health within the natural area. Indicators of general vegetation health, stress (e.g., from drought), and pest or invasive plant infestations should be included in this activity.
- Monitor the condition of the buffer areas surrounding the natural area. Ensure emergency access points are free of woody plant material and mowing is limited within the buffer zones and along trail edges.

Wildlife and Habitat

- Conduct annual bird surveys. This item would likely require volunteer groups or partnerships with appropriate community groups to provide the necessary expertise.
- Monitor the presence of nuisance wildlife.

Safety

- Annually monitor safety conditions within the natural area such as trail condition, trees susceptible to windfall along public access routes, and fuel loading.

Hydrology and Water Resources

- Monitor and record water levels in wetland natural areas. Monitoring should be conducted at least annually at the same time of year in order to obtain long-term trend data.
- Conduct visual inspections of inlets and outlets to wetland natural areas (or other natural area types as necessary) for blockages or impediments to water flow. Coordination with Drainage Services for corrective action may be required.
- Periodically check for adequate drainage of natural areas for ponding and flood risk, particularly following significant storm events.

Human Use

- Continually monitor public use of natural areas including: debris and litter, unauthorized activities such as off-leash pets in non-designated areas, fire, homeless camps, encroachment, vandalism and other crime.

Monitoring frequency and intensity need to be determined through collaboration with various operational groups in the City of Edmonton. Initially, current monitoring efforts will be documented to provide consistent information relating to existing management tasks. Over time, modification of the monitoring program will be made

based on resource availability, identified information gaps across the natural area system, and individual natural area requirements.

Eventually, such monitoring may be able to be linked with monitoring schemes that feed into the Enviso EMS. Within the EMS, staff must monitor their environmental performance, and periodically check their progress through internal and external audits. Linking with these established monitoring activities would be an effective way to further entrench natural areas management into City culture, and to ensure ongoing monitoring and measurement of progress.

7.3 REPORTING

Data collected from natural areas monitoring will enable reporting and analysis of management activities, successes, and areas for improvement. Ideally, data from monitoring activities will be stored in one centrally-accessible database for review by interested parties. Monitoring results from outside stakeholders (e.g., naturalist groups and community support groups) as well as the academic community (University of Alberta, Grant MacEwan University, NAIT, etc.) could be included in the database. Over time, analysis of this database will enable effective reporting and analysis of changes in natural area health and biodiversity, and the effectiveness of management activities.

Ideally, a formalized reporting structure will be used to communicate with stakeholders about the effectiveness of management activities in Edmonton's natural areas. In addition to being of potential interest to members of the public and community partners, internal City groups to the City may also benefit from such reporting. These groups may include City staff who carry out operational work in natural areas, Office of Biodiversity staff revising this document, and management staff who could use the information to better understand funding requests, staffing requirements, and resource allocations related to natural area management. In the latter case, there may again be important opportunity to link with the City's Enviso EMS. On an annual basis, the results of environmental monitoring within the EMS are communicated to the branch management team through a formal report and meeting process. It may prove efficient to streamline natural areas monitoring information into the existing EMS reporting process.

7.4 CONTINUAL IMPROVEMENT THROUGH ADAPTIVE MANAGEMENT

Edmonton's natural areas are in a constant state of change, with pressures such as climate change, invasive species, and a multitude of recreational uses continually altering the management requirements both of specific protected natural areas and of Edmonton's natural area system as a whole. In response to this persistent change, the best natural area management strategy is one that is iterative and can be adjusted over time to react to changing external forces. This process is known as "adaptive management," and is characterized by the continual testing and improvement of management protocols to meet changing ecosystem requirements. Adaptive management provides the City of Edmonton with the most effective means of modifying and updating management protocols to be both proactive and reactive in maintaining the natural area system in a sustainable manner.

This commitment to continual improvement allows for the evolution not only of this document itself, but of the City's ability to adopt new and innovative management approaches to enhancing biodiversity. By considering this management plan to be a "living" document, City staff can effectively manage natural areas in a changing environment.

As discussed throughout this document, this Management Plan will require periodic review to ensure that management objectives are being met. Review periods and milestones will need to be established to determine when and how often the Plan will be updated. As the document and management actions evolve, the Plan will provide more comprehensive and effective management of the City's natural areas. Ultimately, this continual improvement will lead to the protection and enhancement of Edmonton's natural area system.



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8.0 GLOSSARY

Adaptive Management: “A formal, systematic, and rigorous approach to learning from the outcomes of management actions, accommodating change and improving management. It involves synthesizing existing knowledge, exploring alternative actions, and making explicit forecasts about their outcomes” (British Columbia Forest Service 1999).

Biodiversity (Biological Diversity): The variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (Convention on Biological Diversity, 1992; www.biodiv.org).

Biodiversity Core Area: A habitat patch capable of supporting entire populations of plants and animals and associated ecological processes (City of Edmonton 2007).

Bog: Peat covered wetlands in which the vegetation shows the effects of a high water table and a general lack of nutrients. Surface water bodies are strongly acidic and are dominated by *Sphagnum* mosses and heath shrub vegetation – both with and without trees (Canadian Wetlands Conservation Task Force 1993).

Buffer: A band of vegetation or relatively undisturbed land around or along a core area intended to act as a natural barrier that moderates negative effects from outside activities before they can impact the area of interest.

Connectivity: The degree to which a landscape facilitates or impedes movement among resource patches. Connectivity is also crucial for adaptive responses to long-term changes such as climate change. It may be provided by corridors, stepping stones and/or compatible adjacent land uses (City of Edmonton 2007).

Conservation: Maintenance of environmental quality and resources or a particular balance among the species present in a given area through the management of resources within social and economic constraints while acknowledging the naturally dynamic character of biological systems (adapted from Allaby 1998).

Core Areas: Habitat patches of suitable size and quality so as to provide environmental conditions that support entire populations of animals and plants and associated ecological functions (City of Edmonton 2007).

Corridor: Natural or semi-natural linear vegetated patches that enhance movement among other habitat patches such as core areas or natural stepping stones (City of Edmonton 2007).

Ecological Network: A coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintaining or restoring ecological functions as a means to conserve biodiversity (City of Edmonton 2007).

Ecological Services: Services which humans derive from ecological functions such as photosynthesis, oxygen production, and water purification (City of Edmonton 2007).

Endangered Species: A species whose present existence in Alberta is in danger of extinction within the next decade (Government of Alberta 2000).

Environmentally Sensitive Area: A natural site in Edmonton that is larger than 1.0 ha (wetlands) or 2.0 ha (forested areas) and is “undisturbed or relatively undisturbed” and which “because of its natural features has value to society and ecosystems worth protecting, but are susceptible to further disturbance”. These sites might provide habitat for rare species, exhibit high diversity, contain unique or sensitive landforms, or provide critical hydrological functions (Alberta Environmental Network and City of Edmonton 2001)

Exotic: From elsewhere; introduced into an area; non-native.

Extirpated: Locally extinct, but still present in one or more locations elsewhere.

Fen: Peat covered wetland characterized by a high water table, slow internal drainage by seepage down low gradients; may exhibit low to moderate nutrient content and may contain shrubs, trees or neither (Canadian Wetlands Conservation Task Force 1993).

Function: Describes what the natural feature (e.g., wetland) does in ecological terms without any reference to any monetary or social values that society places upon that function.

Goal: A broad, long-term projection of desired outcomes relative to the overall purpose of the project and nature of the natural site.

Habitat: A place where an organism lives that provides resources necessary for that organism's survival.

Herb: A plant without woody above-ground parts, the stems dying back to the ground each year (e.g., forbs, grasses, sedges, rushes, ferns; Johnson et al. 1995).

Herbaceous: Herb-like, pertaining to an herb.

Hydrology: The study of the flow of water in various states through terrestrial and atmospheric environments (Allaby 1998).

Introduced Species: A species that is not native to an area, but was established in the area because of human activity.

Linkages: Arrangements of natural or semi-natural vegetation that enhance either structural and/or functional connectivity (for species, communities or ecological processes) between core areas. There are 2 main types of linkages: stepping stones and corridors (City of Edmonton 2007).

Marsh: Nutrient-rich wetlands that are periodically or permanently inundated by standing or slow moving water mainly possessing wet mineral soils; they are subject to a gravitational water table but water remains within the rooting zone of plants for most of the growing season; emergent vegetation consists of reeds, cattails and sedges (Canadian Wetlands Conservation Task Force 1993).

Matrix: All of the land not considered to be part of core areas or linkages i.e. background ecosystems or land uses within which habitat patches (core areas and linkages) lie on a landscape. In an urban landscape the matrix generally represents development (City of Edmonton 2007).

Migratory Species: A species that is at least annually required to travel large distances to link seasonally important habitats that are critical to some part of their life cycle.

Natural Area: The City defines a natural area as an area of land or water that is dominated by native vegetation in naturally occurring patterns. Such areas could include grasslands, forests, wetlands, peatlands, or riparian areas. Areas such as groomed parks, sports fields, and school yards are not natural areas (City of Edmonton 2007).

Noxious Weed: A plant designated in accordance with the regulations as a noxious weed and includes the plant's seeds. This weed designation can be seen as regulatory support for a "containment" stage of invasive plant management. Plants listed in this category are considered to widely distributed to eradicate. A local authority may conduct control programs for these weeds if they feel they may have significant ecological or economic impact on lands within their municipality (Wheatland County 2012).

Nuisance Wildlife: Wild animals whose activities or presence create a hazard or inconvenience for humans (the list of animals fitting this definition may change over time).

Objective: End results that will achieve broader goals. They describe desired future conditions, and are measurable, time-specific and geographically specific.

Peatland: Vegetated wetlands with a minimum organic soil depth of 40cm resulting from the accumulation of peat (decomposing plant material).

Policy Statement: A statement that puts the management plan into an administrative context and makes it specific to the natural area of interest (Government of British Columbia 2000).

Prohibited Noxious Weed: A plant designated in accordance with the regulations as a prohibited noxious weed and includes the plant's seeds. This weed designation can be seen as regulatory support for an "Early Detection, Rapid Response" stage of invasive plant management. Plants in this category are either not currently found in Alberta or are found in few locations such that eradication could be possible. Under the Weed Control Act a person has a responsibility to destroy a prohibited noxious weed (Wheatland County 2012).

Rare Species: For plants, where they are few in number or found only in a limited number of areas (often 5 or fewer in the province); they are not in immediate danger of extinction but could be at risk due to their numbers and or distribution, these species may be wide-spread in other geographic locations outside of Alberta (Argus and White 1978).

Regional Biological Corridor: The North Saskatchewan River Valley represents a regional biological corridor, from the Rockies through the Prairies, permitting the movement of wildlife species and supporting many ecological processes (City of Edmonton 2007).

Restoration: The re-establishment of habitat in order to improve ecological processes or connectivity (City of Edmonton 2007).

River Valley: The North Saskatchewan River Valley and associated system of tributary ravines (City of Edmonton 2007).

Semi-natural Landscape Elements: At least partially manicured green spaces (such as active recreation parks, schoolyards, cemeteries, conventional stormwater management facilities and some rights-of-way; City of Edmonton 2007).

Significant Natural Area: A site larger than 1.0 ha (wetlands) and 2.0 ha (forested areas) that “has the potential to remain sustainable within an urban environment and is significant from an environmental perspective to the community of Edmonton because of its size or features of the site” (Alberta Environmental Network and City of Edmonton 2001).

Snag: A dead standing tree.

Species at Risk: An extirpated, endangered, or threatened species or a species of special concern (Government of Canada 2002).

Stepping Stone: Natural or semi-natural non-linear vegetated patches that provide many resources for species but may not be of sufficient size or quality to provide for all habitat requirements or ecological functions. They are usually separated by a less hospitable matrix or linked by corridors (City of Edmonton 2007).

Strategy: Describes how to achieve an objective, and pertains to an activity and how that activity is to be conducted. Strategies may be time-specific and measurable (Government of British Columbia 2000).

Swamp: A nutrient-rich, productive wetland where standing or gently moving water occurs seasonally or persists for long periods, leaving the sub-surface continuously waterlogged; they consist of dense coniferous or deciduous forest, or tall shrub thickets (Canadian Wetlands Conservation Task Force 1993).

Tablelands: The upland areas above the North Saskatchewan River Valley and Ravine System. (City of Edmonton 2007).

Threatened Species: A species that is likely to become endangered if the factors causing its vulnerability are not reversed (Government of Alberta 2000).

Value: The benefit that a specific ecological function provides to society.

Wetland: Land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to a wet environment (Canadian Wetlands Conservation Task Force 1993).

Wildlife: Organisms in the Kingdom Animalia (animals), including big game, fur-bearers, birds of prey, insects and other invertebrates, reptiles, amphibians, fish, wildlife parts, eggs and young.

Wildlife Travel Corridor: An area, usually one providing vegetated or terrain cover that reduces wildlife exposure to predators and weather, that is used by wildlife to travel from one habitat area to another.

Woodland: An area dominated by trees.

9.0 ACKNOWLEDGEMENTS

Edmonton's Natural Area System Management Plan was developed internally by City of Edmonton staff. The framework was informed by the San Francisco Natural Areas Program (SFNAP) model for managing natural areas (SFNAP 2006). The City of Edmonton Parks Branch recognizes and thanks the SFNAP for leading the way in natural area management.

The Master Naturalist Program has provided considerable support in aiding the City's management of natural areas and their stewardship activities over the past few years. Many of the tasks and programs that are led by this group would not be possible otherwise and the Office of Biodiversity would like to acknowledge the efforts of Master Naturalists.

The Office of Biodiversity would also like to extend heartfelt thanks to the parks operations staff for its involvement in the development of the City-Wide Natural Area Management Plan. Parks operations groups include: Parks Operations (West, East, and South), River Valley Forest and Environmental Management, Park Rangers, Parks Resource Management, Parks Planning, and the Parks Branch Management Team.



PHOTO COURTESY OF DAVE CONLIN

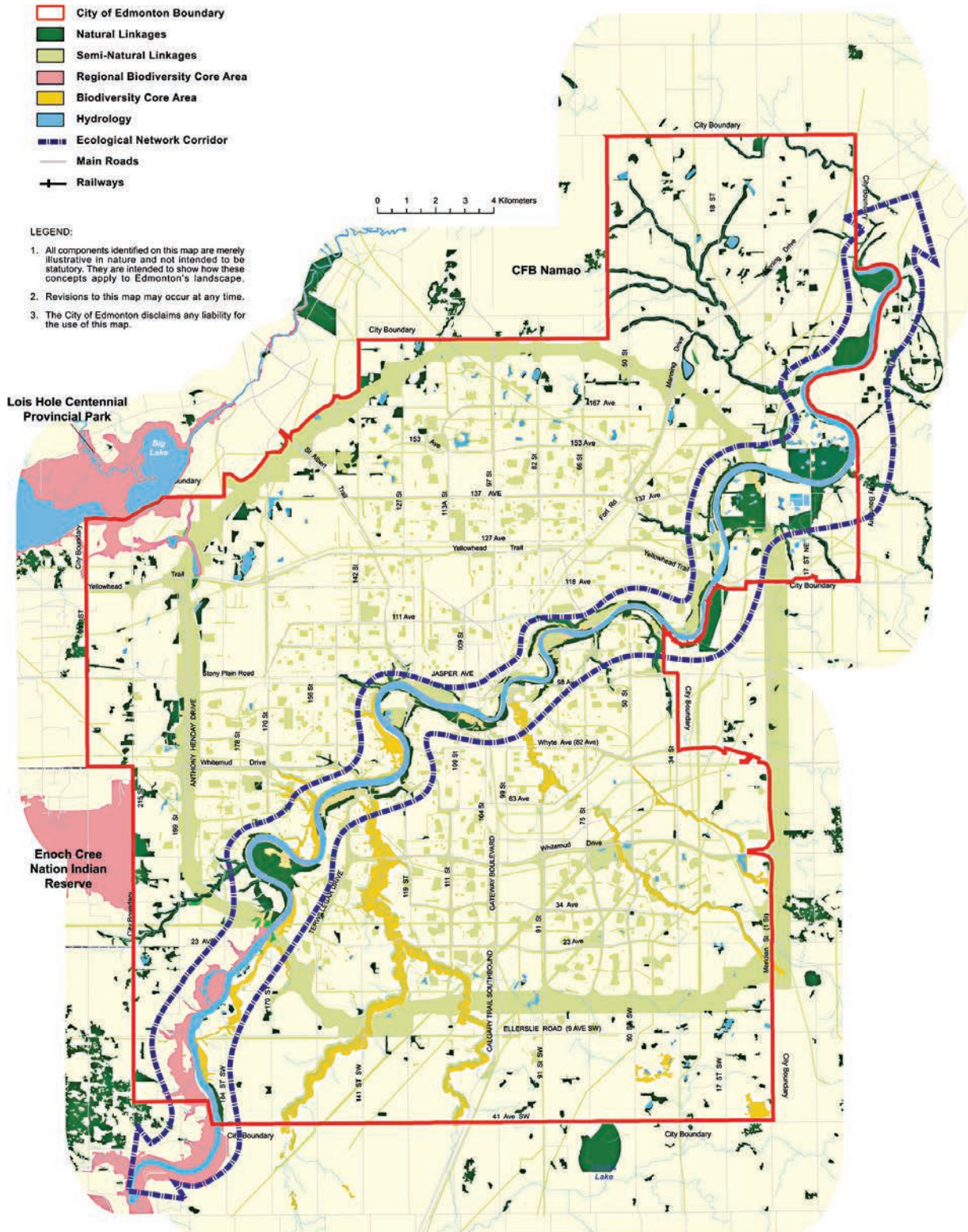
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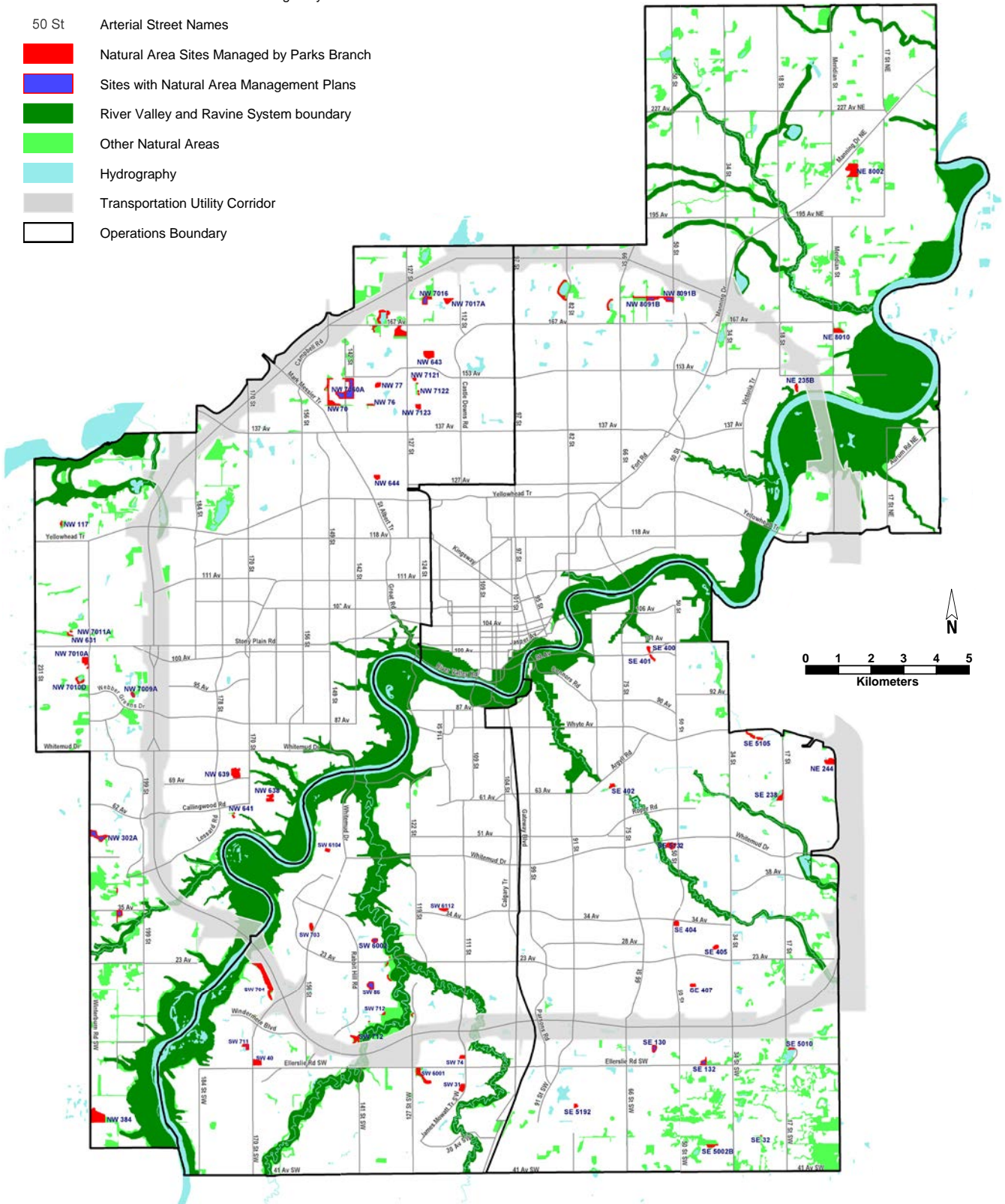
APPENDICES

APPENDIX A — Edmonton's Ecological Network

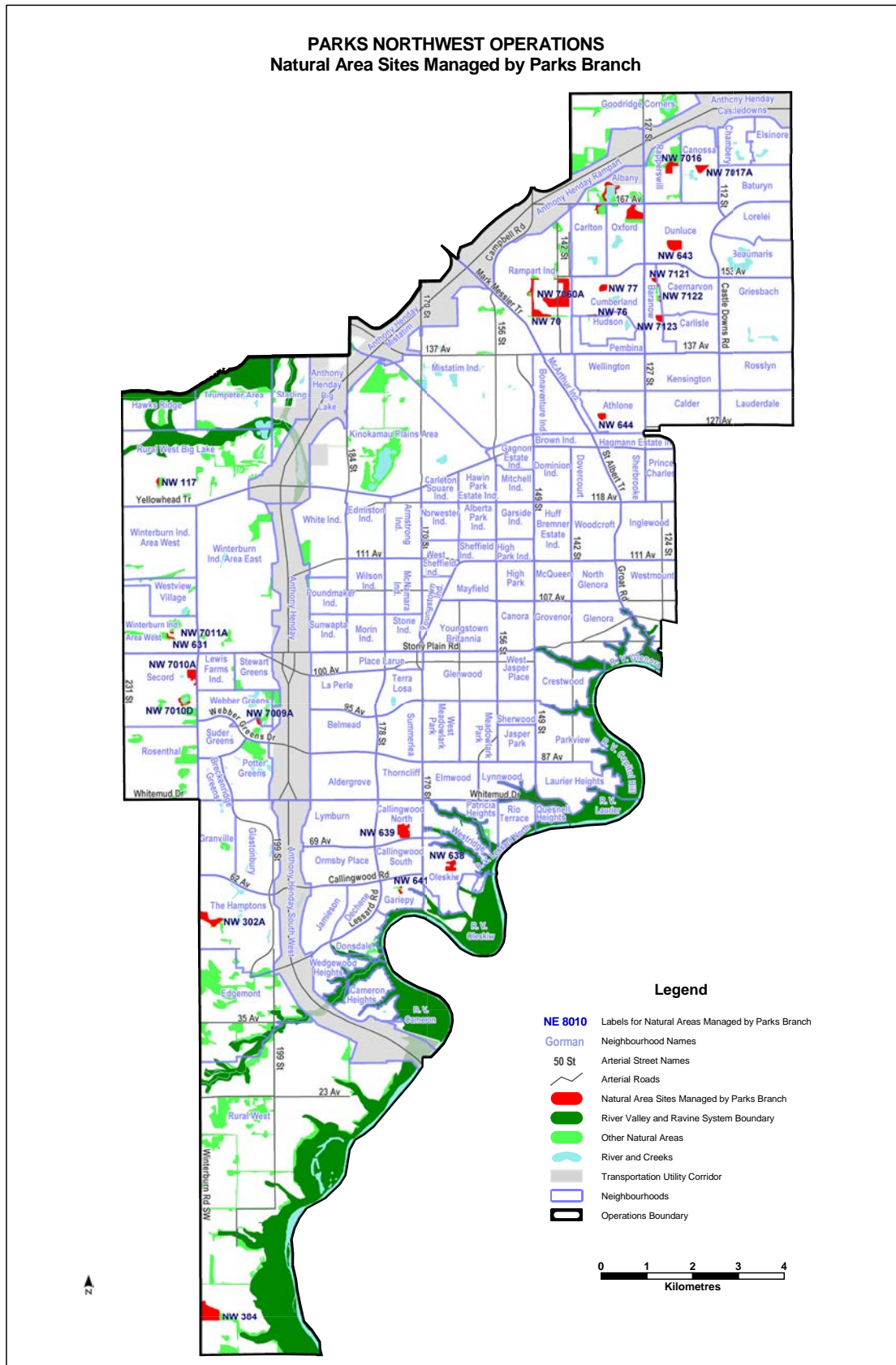


APPENDIX B — Natural Areas managed by Parks Branch

- NE 8010 Labels for Natural Areas Managed by Parks Branch
- 50 St Arterial Street Names
- Natural Area Sites Managed by Parks Branch
- Sites with Natural Area Management Plans
- River Valley and Ravine System boundary
- Other Natural Areas
- Hydrography
- Transportation Utility Corridor
- Operations Boundary



APPENDIX B — Managed Natural Areas in Northwest Districts



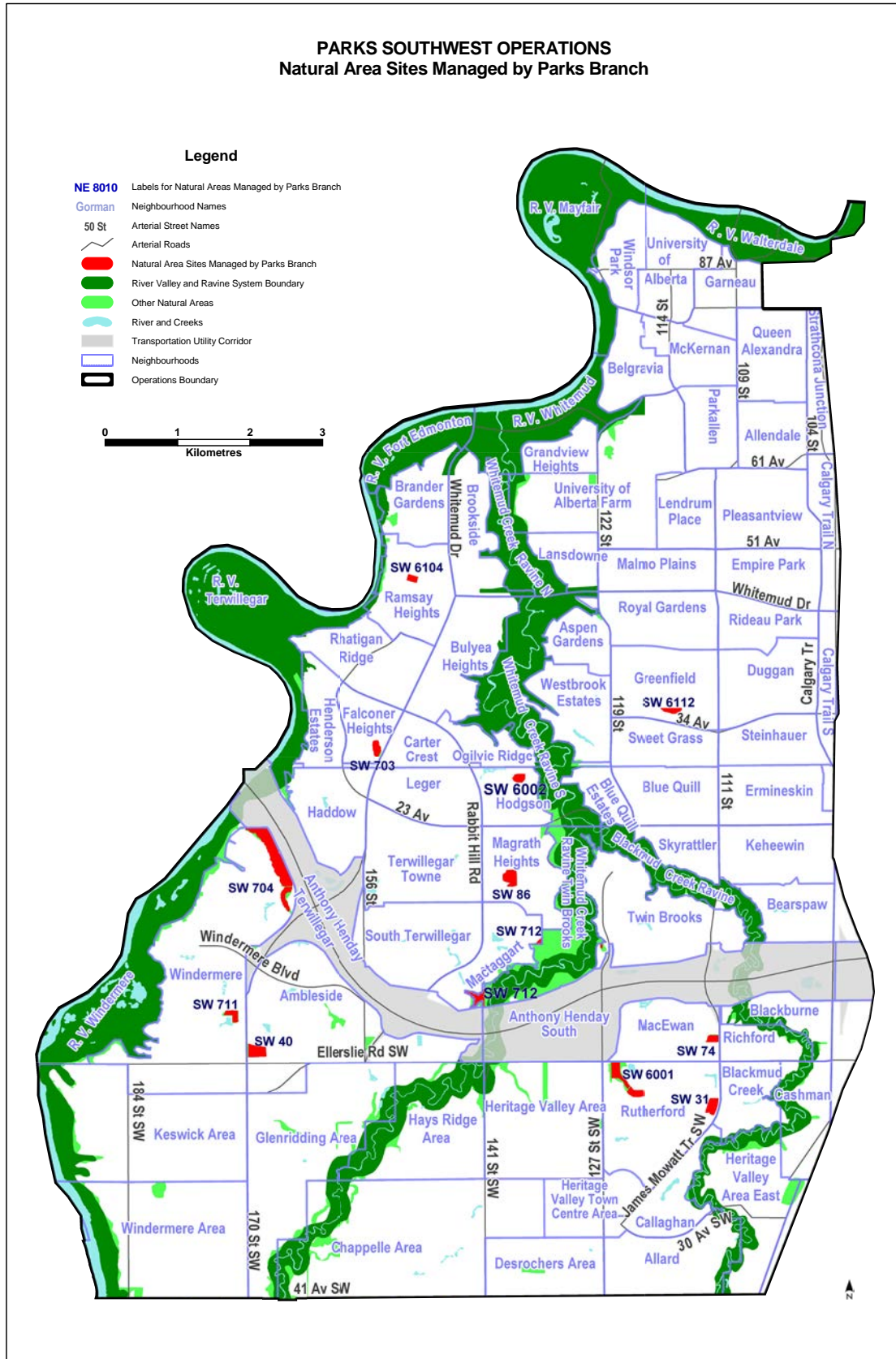
Note: Managed sites may not include provincially owned or privately owned lands for which management agreements with the City are in place.

APPENDIX B — Managed Natural Areas in Northwest Districts

Park Name / Site	Neighbourhood	Natural Area ID	Area (ha)	SSNAMP?
Dunluce Natural Area	Dunluce	NW 643	5.7	
Athlone Natural Area	Athlone (Dunvegan)	NW 644	1.8	
Canossa Park 2	Canossa	NW 7017A	2.6	
Baranow Park 1 & 3	Baranow	NW 7121 & 7123	1.5	
Cumberland Natural Area	Cumberland	NW 77	1.8	
Henry Singer Park	Rampart Industrial	NW 70	5.5	
Henry Singer Park	Rampart Industrial	NW 7060A	14.7	
Mooncrest Park	Kinokamau Plains	NW 7004B	0.5	
Lewis Farms	Potter Greens	NW 7009B	0.9	YES
Secord Park 1	Secord	NW 7010A	3.7	
Secord Park 3 & 5	Secord	NW 7010D	0.8	
Oleskiw Park	Oleskiw	NW 638	3.1	
Callingwood Park	Callingwood	NW 639	6.4	
Gariepy Park	Gariepy	NW 641	0.4	
The Hamptons Park 2	The Hamptons	NW 302A	6.0	
Rural West 11	Rural West	NW 384	13.4	
Albany	Albany	NW 7024	2.3	YES
Hawks Ridge	Hawks Ridge	NA1	3.6	YES
Starling	Starling	NW 7166	15.4	YES
Rapperswill	Rapperswill	NW 7016	3.6	
Rural West Big Lake	Rural West Big Lake	NW 117	0.5	
Edgemont	Edgemont	NW 339	2.4	
Oxford	Oxford	NW 46	7.0	
Winterburn Ind. Area West	Winterburn Ind. Area West	NW 631	0.4	
Winterburn Ind. Area West	Winterburn Ind. Area West	NW 7011A	0.1	
Cumberland	Cumberland	NW 76	0.5	
		Total Area	104.6 ha	

Note: There are many additional park spaces with natural area components that may not be included in the inventory lists. Typically, tree stands and other areas of natural vegetation less than 1.0 hectare are not included in the natural area inventory. However, management approaches for these sites should be similar.

APPENDIX B — Managed Natural Areas in Southwest Districts



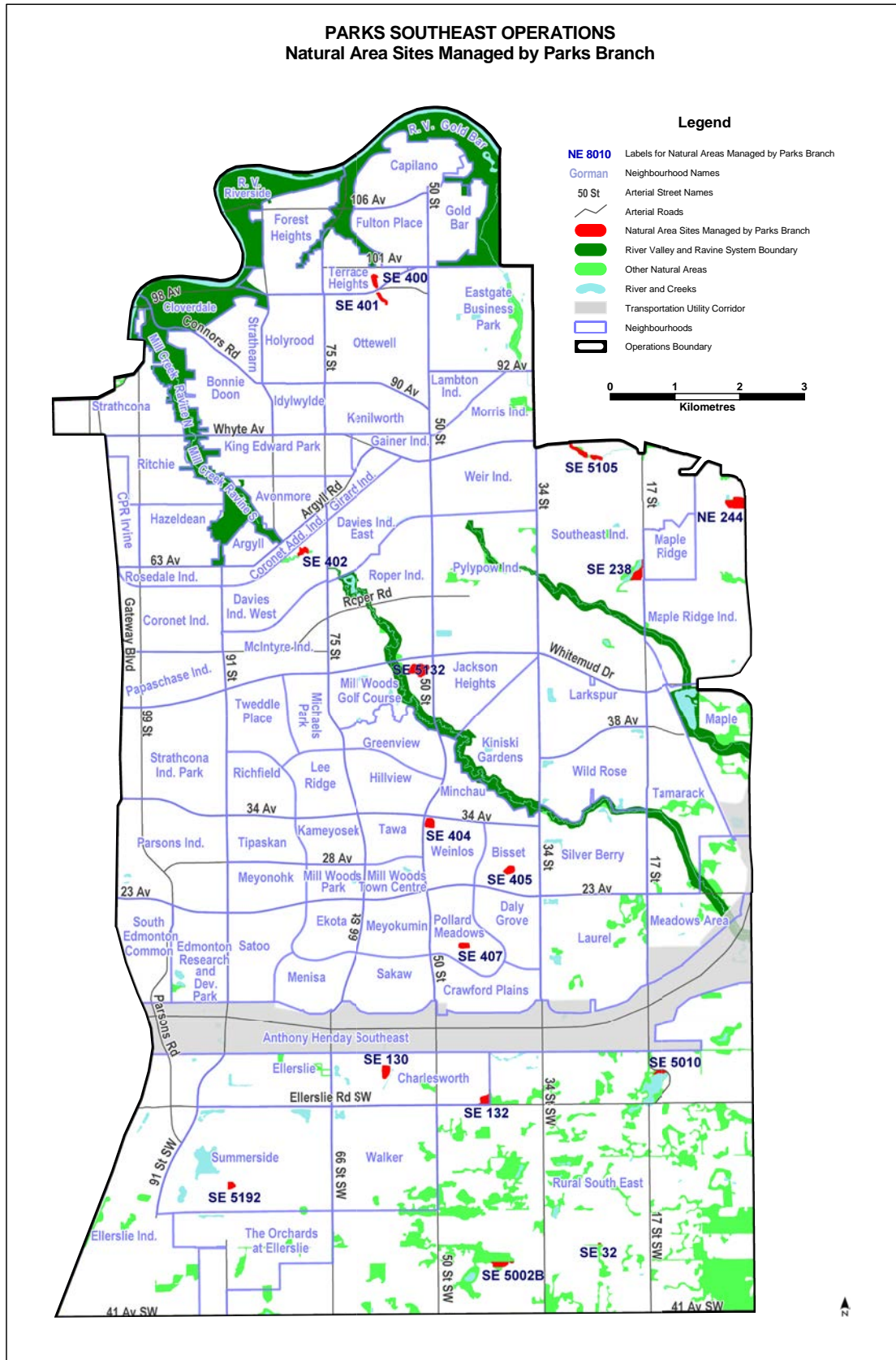
Note: Managed sites may not include provincially owned or privately owned lands for which management agreements with the City are in place.

APPENDIX B — Managed Natural Areas in Southwest Districts

Park Name / Site	Neighbourhood	Natural Area ID	Area (ha)	SSNAMP?
Rutherford Park 5	Rutherford	SW 31	2.6	
Ambleside Park 3	Ambleside	SW 40	3.4	
Rutherford Park 2	Rutherford	SW 6001	4.9	
Hodgson Wetland	Hodgson	SW 6002	1.5	YES
(Un-named)	Ramsay Heights	SW 6104	1.0	
J. A. & W. E. Werner Parks	Greenfield	SW 6112	1.3	
Larch Lands	Magrath Heights	SW 6145	7.0	YES
Falconer Heights Park 1	Falconer Heights	SW 703	1.8	
(Un-named)	Windermere	SW 704	2.1	
Whitemud Ravine Nature Reserve (above TOB)	N/A	SW 707	14.0	
Whitemud Ravine Nature Reserve (above TOB)	N/A	SW 712	36.7	
MacEwan Park 1	MacEwan	SW 74	1.4	
Highland	Magrath Heights	SW 86	3.3	YES
Desroches	Desroche	SW 7	3.9	YES
Langdale	Langdale	SW 711	1.3	YES
		Total Area	48.5 ha	

Note: There are many additional park spaces with natural area components that may not be included in the inventory lists. Typically, tree stands and other areas of natural vegetation less than 1.0 hectare are not included in the natural area inventory. However, management approaches for these sites should be similar.

APPENDIX B — Managed Natural Areas in Southeast Districts



Note: Managed sites may not include provincially owned or privately owned lands for which management agreements with the City are in place.

APPENDIX B — Managed Natural Areas in Southeast Districts

Park Name / Site	Neighbourhood	Natural Area ID	Area (ha)	SSNAMP?
MTRS	Charlesworth	SE 132	1.9	YES
Maple Ridge (un-named)	Maple Ridge Industrial	SE 238	2.1	
Maple Ridge Industrial Park 2	Maple Ridge Industrial	SE 244	4.0	
Fulton Ravine South	Terrace Heights	SE 400	1.4	
Austen O'Brien	Ottewell	SE 401	1.0	
W. P. Wagner	Davies Industrial West	SE 402	1.2	
Graunke Park	Weinlos	SE 404	1.8	
Starblanket Park	Bisset	SE 405	1.6	
Pollard Meadows	Pollard Meadows	SE 407	1.2	
Rural SE Park 1	Rural SE	SE 5010	0.6	
Roper Park & Natural Area	Roper Industrial	SE 5090	4.3	
Pylpov / Fulton	Pylpov Industrial	SE 5094	11.4	YES
SE Industrial Park 1 & 2	SE Industrial	SE 5105	2.5	
Charlesworth	Charlesworth	SE 411	1.8	YES
Southport	Ellerslie Industrial	SE 5016	3.1	YES
Charlesworth	Charlesworth	SE 130	1.9	
Rural SE	Rural SE	SE 5002B	1.6	
Jackie Parker Park	N/A	SE 5132	4.1	
Summerside	Summerside	SE 5192	1.0	
		Total Area	86.2 ha	

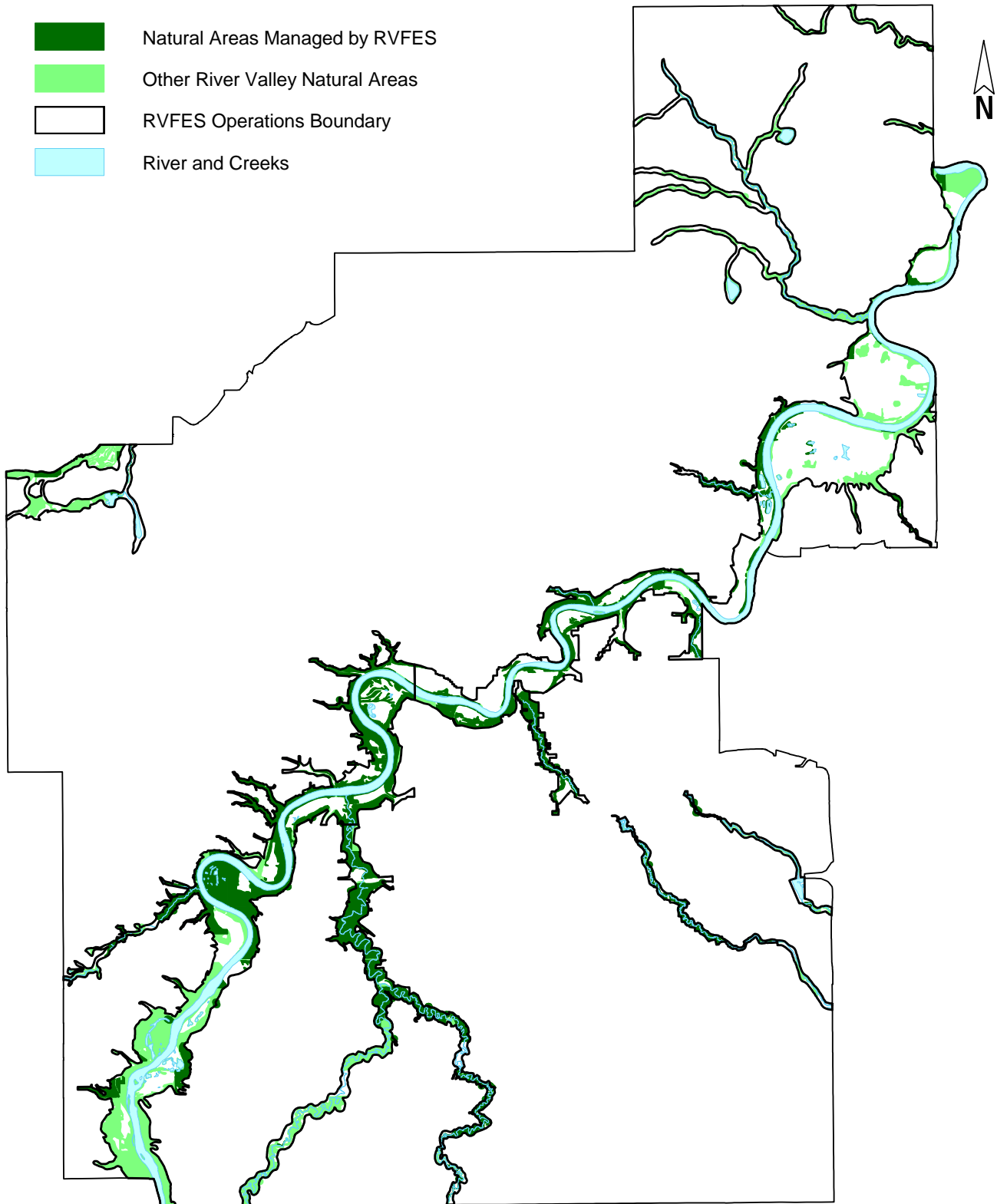
Note: There are many additional park spaces with natural area components that may not be included in the inventory lists. Typically, tree stands and other areas of natural vegetation less than 1.0 hectare are not included in the natural area inventory. However, management approaches for these sites should be similar.

APPENDIX B — Managed Natural Areas in Northeast Districts

<i>Park Name / Site</i>	<i>Neighbourhood</i>	<i>Natural Area ID</i>	<i>Area (ha)</i>	<i>SSNAMP?</i>
<i>Poplar Lake</i>	<i>Klarvatten</i>	<i>NE 8099</i>	<i>14.6</i>	<i>YES</i>
<i>Rural NE Park 1</i>	<i>Rural NE: S Sturgeon</i>	<i>NE 8010</i>	<i>2.8</i>	
<i>Crystallina</i>	<i>Crystallina</i>	<i>NE 8088</i>	<i>4.3</i>	<i>YES</i>
<i>McConachie</i>	<i>McConachie</i>	<i>NE 8091</i>	<i>6.4</i>	<i>YES</i>
<i>Schonsee Wetland</i>	<i>Schonsee</i>	<i>NE 8094/8095</i>	<i>0.7</i>	<i>YES</i>
<i>Fraser</i>	<i>Fraser</i>	<i>NE 235B</i>	<i>1.4</i>	
<i>Rural NE Horse Hill</i>	<i>Rural NE Horse Hill</i>	<i>NE 8002</i>	<i>11.1</i>	
		Total Area	41.3 ha	

Note: There are many additional park spaces with natural area components that may not be included in the inventory lists. Typically, tree stands and other areas of natural vegetation less than 1.0 hectare are not included in the natural area inventory. However, management approaches for these sites should be similar.

APPENDIX B — Managed Natural Areas in the River Valley and Ravine System



APPENDIX B — Managed Natural Areas in the River Valley and Ravine System

Park Name / Site	Area (ha)	Park Name / Site	Area (ha)
Rural West Big Lake	13.1	River Valley Fort Edmonton	24.0
		River Valley Lessard North	56.8
Rural NE North Sturgeon	2.7	River Valley Oleskiw	51.8
Rural NE South Sturgeon	35.3	River Valley Terwillegar	206.1
Cloverbar Area	47.5	River Valley Cameron	80.7
River Valley Hermitage	101.0	Rural West	40.5
River Valley Rundle	11.6	River Valley Windermere	0.8
River Valley Highlands	27.7		
River Valley Gold Bar	67.5	River Valley Walterdale	63.9
River Valley Riverside	36.1	Mill Creek Ravine North	52.6
River Valley Kinnaird	51.3	Mill Creek Ravine South	32.7
Cloverdale	18.2	Upper Mill Creek Ravine	73.5
Riverdale/Rossdale/Downtown	12.2	Fulton Creek Ravine	9.9
River Valley Victoria	10.8		
		River Valley Whitemud	61.9
River Valley Mayfair	73.8	Whitemud Creek Ravine North	67.3
River Valley Glenora	22.8	Whitemud Creek Ravine South	182.7
River Valley Capitol Hill	92.7	Whitemud Creek Ravine Twin Brooks	113.2
River Valley Laurier	32.4	Blackmud Creek Ravine	126.6
		Total Area	1901.7 ha

Note: There are many additional park spaces with natural area components that may not be included in the inventory lists. Typically, tree stands and other areas of natural vegetation less than 1.0 hectare are not included in the natural area inventory. However, management approaches for these sites should be similar.

