



Edmonton

Natural Connections

STRATEGIC PLAN | 2007





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More than 100 Open House attendees
Over 1,300 Survey respondents

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Section 1:

Setting the Context

Natural Connections: Renewing our commitment

The Seeds of Conservation Planning in Edmonton

- A Culture of Planning and Partnership: 100 Years in the Making
- Building on a Legacy: A Brief Overview of Existing Plans and Policies
- Edmonton's Natural Areas: Where Are We Now?
- Protecting our Natural Areas: What We Heard from Edmontonians
- The Status Quo: What We Risk Losing



Natural Connections: Renewing Our Commitment

“A city, like a living thing, is a united and continuous whole.”

– Plutarch, Greek historian and essayist, ~AD 46-127.

In 2005, City Council directed the Office of Natural Areas to develop a new natural areas conservation plan that would integrate planning and protection measures for natural areas within municipal boundaries. This conservation plan, entitled Natural Connections, will ensure that future conservation efforts consider all natural areas in Edmonton as a whole network – greater than the sum of its parts – that includes natural areas in the North Saskatchewan River Valley, ravine system and ‘tablelands’ – those upland areas above the river valley.

Natural Connections focuses on strengthening connections:

- between natural areas, in the form of diverse, functional biological corridors that support critical natural processes and the movement of wildlife; and
- between people, in the form of supportive, creative partnerships that empower Edmontonians to work cooperatively to protect and sustain Edmonton’s natural systems.

Natural Connections has two components: a Strategic Plan and an Implementation Plan. The Natural Connections Strategic Plan is based on both the latest conservation science and stakeholder input. It sets out the City’s conservation vision, goals and system outcomes – the strategic direction – that will guide conservation planning over the next ten years. In contrast, the Implementation Plan will define roles, responsibilities and specific strategies to protect natural areas. The Implementation Plan focuses on the shorter term and may be altered annually to respond to emerging circumstances.

This document comprises the Natural Areas Strategic Plan. The purpose of the Strategic Plan is to:

- establish a coordinated direction for the City to conserve an ecologically functional network of natural areas;
- improve resource allocation on both an annual and long-term basis;
- provide a flexible framework for the participation of partners and other associations;
- measure progress toward improved natural areas conservation and to focus improvement efforts;
- provide for an ongoing dialogue between the public and the City about conservation.

The Strategic Plan is not intended to prescribe management of individual natural areas, land use, or administrative designation of the protection status of natural areas. These activities are guided by the Urban Parks Management Plan, Municipal Development Plan, Transportation and Drainage Master Plans, site-specific natural area management plans and Area/Neighbourhood Structure Plans. The Strategic Plan simply identifies Edmonton’s natural areas based on a methodology outlined in sections below, and articulates a strategic conservation planning approach for the City.

The direction set out in the Strategic Plan is not altogether new – it builds on the City’s existing conservation foundation and initiatives to support Edmonton’s conservation vision. The planning and policy documents already in place have contributed to the existence of Edmonton’s functional ecological network. Natural Connections will integrate and strengthen these commitments – it will thread them together, infuse them with a shared purpose, and articulate how best to achieve Edmonton’s conservation vision given existing opportunities.

The Strategic Plan also applies the research conducted for the 2006 State of Natural Areas report. The plan is also supported by a new Natural Areas Systems Policy that will be introduced at the same time. Once both the policy and strategic plan have been approved, the Office of Natural Areas will begin to develop an Implementation Plan.



The Office of Natural Areas is responsible for coordinating conservation efforts, but collaborates with other branches that have greater planning and operational capacity. Our shared focus will extend from acquiring new natural areas, to effective management of protected areas, to exploring opportunities to restore degraded areas. In addition, the City will work to overcome the limitations of available legislative tools and identify new ones. Finally, while the City has a clear responsibility to do what it can within its means, there are also opportunities for the City to partner with and support community groups in pursuit of a shared conservation vision.

The Seeds of Conservation Planning in Edmonton

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”

- Aldo Leopold

Edmonton, like any city, is a living thing. The urban environment is a complex organism that includes both the natural world and man-made features that, properly managed, can complement one another and contribute to Edmonton's unrivalled quality of life.

When the former fur-trading post was incorporated as the City of Edmonton in 1904, it had a population of just over 8,000 people. Its streets were dirt, its sidewalks wood. People burned coal or wood in pot-bellied stoves to heat their homes and businesses, and most traveled by horseback or horse-drawn wagon. Water was drawn from the river and creeks; sewage treatment was limited to collection – in chamber pots and outhouses. A 20 minute walk in any direction led to natural landscape.

Edmonton is now one of Canada's five largest, and fastest growing, municipalities with a population over 700,000 in a metropolitan region of one million. In the last ten years, Edmonton's population has grown dramatically, resulting in the rapid development of previously natural and agricultural landscapes. The region is expected to welcome 400,000 new residents in the next 25 years. That growth requires more development and, at the same time, introduces environmental pressures that were unimaginable in 1904. It is no longer possible to separate “environmental issues,” “quality of life” and “economic necessity”; all these ideas are interrelated and the City must balance environmental protection with economic growth and the social fabric of society.

The North Saskatchewan River Valley constitutes the largest protected urban park in North America and its tributary ravines extend into the heart of many of Edmonton's mature neighbourhoods. Extending outward from this unique riparian system are a range of core natural areas, habitat patches and connective biological corridors that, together, comprise a functional ecological network that hosts a diversity of plant and wildlife species.

Edmontonians also enjoy the unique recreational opportunities provided by natural areas, particularly in the river valley: cycling, running, hiking, cross-country skiing, bird watching and more. Current bylaws require that users respect and make suitable use of natural areas that does not degrade their quality. Natural Connections will help to guide the appropriate balance of conservation and recreation to preserve the same opportunities for future generations.

Edmontonians, who have always proudly embraced their parks and natural areas, have also begun to understand the immense value of Edmonton's natural areas systems, both in their own right and for the ecological services they provide to people and the many other species with which we share this landscape. Natural Connections, renews the City's commitment to protect its natural areas, native species and the natural processes they support for the benefit of all.



SOME KEY TERMS

natural area: 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 schoolyards are not natural areas.

river valley: the North Saskatchewan River Valley and Ravine System as defined by the River Valley Area Redevelopment Plan (Bylaw 7188).

tablelands: Edmonton's 'upland' area – all of the land above the River Valley and Ravine System.



“Perhaps no one thing is more important for large cities or cities which are assured of a great future than that they shall early secure open spaces for the benefit of future generations.”

- F.G. Todd, Letter to Mayor of Strathcona, May 6, 1907

Photo courtesy of City of Edmonton

A Culture of Planning and Partnership: 100 Years in the Making

Edmonton has a notable conservation history. Independent efforts and partnerships have resulted in the protection of many valuable natural areas, of which only a few examples include the following.

- Beginning in the early 1900s, successive City Councils have advanced protection for the North Saskatchewan River Valley and Ravine System.
- Capital region municipalities joined with Edmonton to encourage the province to create Lois Hole Centennial Provincial Park around Big Lake.
- The University of Alberta leveraged a private land donation to create the McTaggart Sanctuary in the Whitemud Creek Ravine.

As conservation has become more important to Edmontonians, the municipality has adjusted its approach to improve conservation efforts. Some of the changes made include, but are not limited to, the following:

- In 2001, the City created a Conservation Coordinator position, which eventually expanded to become the Office of Natural Areas. The Office coordinates the conservation function, bringing other branches together to ensure sound planning and operations in support of natural areas conservation.
- In 1990, the Office of the Environment was created to coordinate the City's response to environmental challenges of all kinds – clean air, climate change, emergency response, etc. One of its ten strategies is the conservation of natural areas systems.
- The Planning and Development Department requires Environmental Reviews for public projects submitted for the North Saskatchewan River Valley and Ravine System, and Natural Site Assessments for applications submitted for areas outside the River Valley that include natural areas. Obtaining this information helps Administration and Council to improve decision-making for these developments.
- The Parks Branch included a “Natural Area Park” designation in its 2006 Urban Parks Management Plan and has been educating residents living near natural areas about their structure, function and value.



- Drainage Services has worked to naturalize some of its stormwater management ponds, providing important connections between natural areas in otherwise residential, commercial or industrial areas.

As well, careful stewardship of Edmonton's natural areas network has been a responsibility shared by the municipality with many dedicated conservation groups. This tradition of shared stewardship was continued with the creation of the Edmonton and Area Land Trust in 2006.

The North Saskatchewan River Valley and Ravine System is a **ribbon of green** running through the City of Edmonton. The natural features, wildlife, vegetation and cultural heritage of Edmonton will be conserved for present and future generations by management of these resources to prevent exploitation, destruction or neglect."

~ Ribbon of Green

Building on a Legacy: A Brief Overview of Existing Plans and Policies

The City's evolving approach to conservation has led to the development of several key conservation planning and policy documents.

River Valley Area Redevelopment Plan (1985):

Addresses protection of the North Saskatchewan River Valley and Ravine System as part of Edmonton's natural areas network and establishes the principles for future parks development.

Ribbon of Green Concept/Master Plan (1992):

The 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," balancing accessibility for public use with protection of the natural landscape and wildlife habitat areas.

Conservation of Natural Areas in Edmonton's Tablelands (1993):

Edmonton's existing Conservation Policy, C467, states that the City of Edmonton will encourage the voluntary conservation and integration of as many environmentally sensitive and significant natural areas into Edmonton's urban environment as is sustainable and feasible.

Plan Edmonton (1998):

Plan Edmonton, Edmonton's Municipal Development Plan, provides strong strategic direction for conservation planning. Two of the key strategies of Plan Edmonton are as follows: 1.6.1 – Develop a comprehensive, integrated plan for the river valley, natural areas and open space lands that: integrates and connects natural areas within the urban fabric to provide access; develops access and recreational use opportunities while protecting the natural environment; encourages the conservation and integration of natural areas that are sustainable and feasible; and re-defines the principle and practices of Municipal Reserve allocation to support the objectives of the open space plan. 1.6.2 – Implement policies for the conservation of natural sites in Edmonton's table lands and the North Saskatchewan River Valley and Ravine System through the planning process.

Urban Parks Management Plan (2006):

Ecological integrity is a key theme of this strategic plan designed to direct the acquisition, design, construction, preservation and use of parks as well as parks policy. The preservation of natural capital and the use of ecological decision-making are identified among UPMP's nine key principles.

Environmental Strategic Plan (2006):

The City's primary environmental planning document, one of the ESP's nine strategies is a Natural Areas Systems Strategy that addresses two topics: protecting and restoring representative ecosystem types, including native tree stands, wetlands, grasslands, and riparian (river shoreline) areas; and maintaining viable populations of native animals and plants, largely by habitat protection.

Within both the civic government and the community, dedicated individuals have achieved much with limited resources. However, given the increasing pressure on Edmonton's remaining natural systems, it is critically important that the City prepare to deepen its commitment to conservation. The new Natural Areas Policy and Natural Connections Strategic Plan are the first steps in that direction.





Photo courtesy of Sheri Hendsbee

Edmonton's Natural Areas: Where are we now?

Natural areas throughout Edmonton are under tremendous pressure as a result of urban, commercial and industrial development, and many have already been degraded, fragmented, or lost altogether.

Edmonton's 2006 State of Natural Areas report identified the following:

- The existing natural areas within Edmonton's municipal boundaries – protected and privately-owned – constitute a functional ecological network.
- Nine percent of Edmonton's land base consists of natural areas, including 63 percent of the river valley and just three percent of the tablelands.
- Of the total land base of tableland natural areas identified in an inventory undertaken in 1993, 23 percent has since been lost to development; another 21 percent has come under some form of protection through either public or private means.
- The 56 percent of remaining tablelands natural area lands is unprotected, subject to increased development pressure, and therefore at a high risk of loss.
- 41 percent of river valley natural areas are protected through being zoned A¹ (including both public and private lands) and another 2 percent is protected through other conservation initiatives² but natural areas in the river valley in the southwest and northeast are under development pressure.

This trend to the loss of significant natural areas, both in the river valley and tablelands, puts at risk the functionality of the City's ecological network and the entire network of natural areas that is one of Edmonton's distinguishing features.



Photo courtesy of Sheri Hendsbee

"9% of Edmonton's land base consists of natural areas."

~ 2006 State of Natural Areas Report, Spencer Environmental

"Children need the freedom to run and explore natural environments, and others need space in which to rejuvenate and enjoy nature."

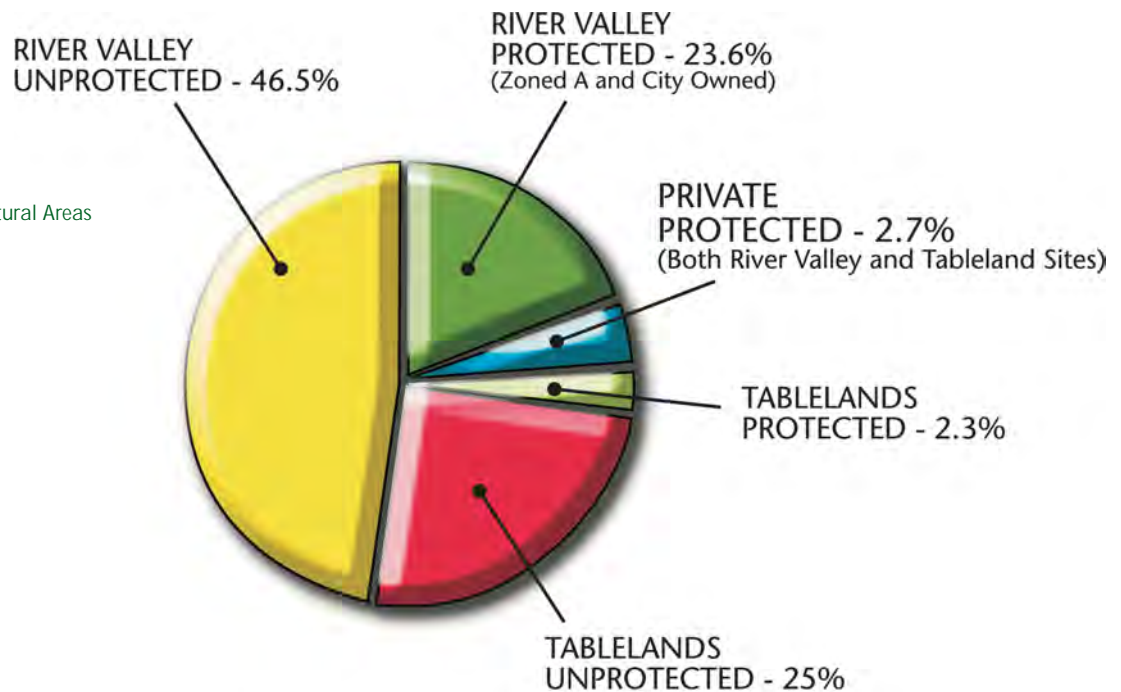
~ Natural Connections Public Engagement Process Participant

¹ The purpose of A – Metropolitan Recreation Zone is to preserve natural areas and parkland along the river, creeks, ravines and other designated areas for active and passive recreational uses and environment protection in conformance with Plan Edmonton and the North Saskatchewan River Valley Area Redevelopment Plan (Zoning Bylaw)

² McTaggart Sanctuary and University of Alberta Forest Reserve



Figure 1:
Status of Edmonton's Natural Areas
(2005)



TOTAL AREA = 7226.6 HA

The State of Natural Areas report also recognized that natural areas must be managed within the context of the surrounding landscape. That is, focusing simply on the retention of natural areas will not sustain functional ecosystems or their associated ecological benefits. Instead, it is important to manage natural areas in relation to one another and in relation to the surrounding landscape. Natural Connections integrates Edmonton's river valley and ravine natural areas with those in the tablelands as a single network within Edmonton

"The protection of natural areas within the urban landscape contributes to the quality of life of its citizens and visitors alike."

- Natural Connections
Public Engagement
Process Participant

Protecting Our Natural Areas: What We Heard From Edmontonians

In the fall of 2006, after the State of Natural Areas report was completed, the Office of Natural Areas engaged Edmontonians in a conversation about the City's natural areas, and how they should be protected and managed in the future. The engagement process included several open houses, an online survey, a facilitated workshop, and two focus groups. Over 1,500 residents participated in at least one of the events, and the vast majority overwhelmingly supported efforts to protect Edmonton's natural areas. The Public Engagement Process Summary Report notes "a majority of survey respondents, most open house attendees and all workshop participants were extremely knowledgeable about conservation issues and passionate in their defense of natural areas".³

There was broad consensus on the following issues:

- The public engagement participants' highest priority was for the City to acquire as many privately owned natural areas as possible to maintain the viability of the City's functioning ecological network.
- Participants were very concerned that current protection methods be improved, not only to protect more lands but also to ensure that, once protected, a natural area would not be vulnerable to development or other uses not consistent with conservation in the future.



³ Teleological Strategic Communications Inc. 2006. Public Engagement Process Summary Report.

- Participants suggested the City make conservation part of its planning processes from the very beginning rather than have it considered later in the approval process.
- Participants said the City needed to work with developers to provide incentives to those who support conservation and disincentives to those to whom conservation is an afterthought.
- Participants emphasized the need to develop partnerships with stakeholder groups and the general public to help ensure specific natural areas are maintained to preserve their ecological function.

Other surveys of Edmontonians conducted in the last several years tell the same story: Edmontonians feel a strong connection to the City's remaining wild spaces and believe the City should act quickly and assuredly to protect them for the long-term.⁴



Photo courtesy of City of Edmonton



Photo courtesy of Grant Pearsell



Photo courtesy of City of Edmonton

4 Canada West Foundation. 2007. Looking West 2007: Segment 1 – Urban Environment.
 City of Edmonton. 2004. Urban Parks Management Plan: General Public Consultation.
 City of Edmonton. 2006. Quality of Life and Financial Planning Survey: Analysis of Findings.
 City of Edmonton. 2007. Stage 1: Public Involvement Results Overview. Stakeholder Values on Future Land Use, Development and Redevelopment. Focus Edmonton: City Plan public consultation report.
 River Valley Alliance. 2007. Capital Region River Valley Park: A Plan for Action.



"To find a deer grazing beside a bike trail at twilight, a porcupine who has wandered up from the ravine to check out my backyard, the variety of fall migrants who stop here for a while, the awesome delight of finding a lady's slipper in bloom in the ravine - these are treasures of priceless wonder."

~ Natural Connections
Public Engagement
Process participant

The Status Quo: What We Risk Losing

The trend identified in the 2006 State of Natural Areas report suggests that the current approach to land development could result, over time, in the loss of more than half the area of existing natural systems in Edmonton's tablelands. Reversing this risk requires that the City renew its focus on conservation and habitat preservation.

The potential loss of Edmonton's natural areas is more significant than most of us imagine: it is not simply a matter of proximity to nature that is at risk. Edmonton's ecological network provides citizens with many benefits, most of which are not considered in conventional accounting. These can be divided into five categories:

- provisioning services – e.g. the production of energy and water;
- regulating services – e.g. the control of climate and waste;
- supporting services – e.g. nutrient cycles and crop pollination;
- cultural services – e.g. research, education, spiritual and recreational benefits; and
- preserving services – e.g. guarding against uncertainty through the maintenance of diversity.

Sustaining natural areas systems means these benefits are available to us for free. Natural areas intercept rainfall, reducing the need for expensive stormwater infrastructure. Wetlands filter pollutants out of water, making us less dependent on water treatment. Trees and other natural vegetation remove carbon dioxide from the air, reducing the harmful impacts of emissions on climate change. Losing these natural systems also means losing these benefits. In their place, we will be forced to replicate with built infrastructure – less efficiently and at great expense – the intricate processes they support.

Quite aside from the well-being of humans, sustaining natural systems also means protecting the many species that depend on them for survival, and ensuring the persistence of Edmonton's ecosystems for their inherent value and their intrinsic right to exist.

The time to protect these valuable natural systems is now. As development pressure continues to grow, land values increase and the cost of purchasing natural areas rises almost daily. If we do not set a sound course for conservation today, the opportunity to protect Edmonton's ecological network will be lost.





Section 2: Strengthening our Approach to Conservation

Plan Approach

- An Outcome-Based System Approach to Conservation Planning
- An Ecological Network Approach to Conservation

Relevance of this Approach to the Edmonton Context



Plan Approach

Natural Connections uses an outcome-based system approach and an ecological network approach in support of conservation planning.

An Outcome-Based System Approach to Conservation Planning

The Natural Connections Strategic Plan uses an outcome-based, system approach to define the measures to assess progress toward the City's conservation vision and goals. This is a significant departure from conventional approaches for two reasons.

- It focuses on the measurement of outcomes rather than outputs. While outputs measure an organization's success in completing actions to which it has committed, outcomes measure the effect such actions actually have on the system in question – in this case, Edmonton's ecological network. In other words – are our actions making a real difference on the ground?
- It identifies system outcomes and system indicators. The system in question – which includes Edmonton's ecological network (a spatial component) and of the people involved in its conservation, management and appreciation (an organizational component) – is characterized by multiple players and many interactions, both social and ecological. Rather than establishing an outcome and indicator for each specific action (including those undertaken by organizations external to the City), the Office of Natural Areas has identified outcomes and corresponding indicators that will measure their combined effect on the system as a whole. Instead of measuring, for example, the number of conservation education programs implemented by the City, it will measure the effect of those programs on the system – in this example, the change in awareness of Edmontonians with regard to conservation issues.



Photo courtesy of Sheri Hendsbee

The Office of Natural Areas assessed the current conservation context, including opportunities and constraints, within which the City is working. The City's citizen-based Natural Areas Advisory Committee next developed the Vision, which was subsequently adopted by the Office. The Office then developed a set of Guiding Principles. The public engagement process and ongoing collaboration with an internal working group led to the development of Goals, System Outcomes and Indicators, Strategic Directions and Strategies.

All the Strategic Plan components are outlined in Section 3 except System Indicators, which are included in Section 4.



Figure 2:
The relation between components of the Natural Connections Strategic Plan - an illustration of how the Strategic Plan was developed and the relationship of its components.



An Ecological Network Approach to Conservation

The City of Edmonton is using an ecological network approach to conserve our rich natural heritage and integrate the river valley and tablelands natural areas into a single natural areas conservation system. Based on conservation science, this approach aims to protect biodiversity and ecological functions by recognizing the natural connections between natural areas and their surroundings. Connectivity is inherent to an ecological network. Ultimately, an ecological network enables animals, plants and ecological processes to persist on a landscape scale by facilitating critical processes such as nutrient flow, genetic exchange and movement for resources (Please refer to shaded box below and on following page for more information on ecological networks.)

Edmonton's Ecological Network will be a system of conserved and protected core natural areas that are ecologically connected by both natural and semi-natural linkages and, to the extent possible, surrounded by compatible land uses.

What is a natural area?

In the broadest sense, a natural area is an area of land that is dominated by native vegetation in naturally occurring patterns. Typically, natural areas include forests, grasslands, wetlands, riparian areas, lakes and rivers. The 2006 State of Natural Areas Report used air photo interpretation to identify natural areas that were one hectare or greater in size regardless of quality, successional stage, ownership or protection status. This is the inventory of natural areas used within this Plan

What is an ecological network?

Ecological network: A coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintain or restoring ecological functions as a means to conserve biodiversity.⁵

Connectivity: The degree to which a landscape facilitates or impedes movement among resource patches. It may be provided by stepping stones, corridors and/or compatible land uses.

The basic structure of an ecological network has three main landscape elements: core areas, linkages (stepping stones and/or corridors) and matrix.

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.

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.

1. **Stepping stones:** 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.
2. **Corridors:** natural or semi-natural linear vegetated patches that enhance movement among other habitat patches such as core areas or natural stepping stones.



Photo courtesy of Angela Hobson



⁵ Bennett, G and P. Wit. 2001. The Development and Application of Ecological Networks: a review of proposals, plans and programmes. IUCN.

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.

Two other elements are critical to consider in the proper functioning of an ecological network: buffers and barriers.

Buffers: protect core areas and linkages from negative impacts from the matrix and associated human activities. In other words, a buffer allows conflicting land uses to coexist and mitigates edge effects.

Barriers: elements that wildlife would consider a deterrent to movement and would avoid crossing such as roads. In other words, barriers significantly reduce connectivity.

Figure 3: Basic structure of an ecological network

Planning for an Ecological Network

To ensure the establishment and longevity of an ecological network, four indispensable patterns have been identified.⁶ It is essential to maintain:

1. A few large patches of natural vegetation, i.e. protecting a system of biodiversity core areas is the backbone of an ecological network. These core areas will support entire populations of plants and animals and associated ecological processes.
2. Wide vegetation corridors along major water courses, i.e. adequate riparian zones should be kept along major rivers and tributaries. Riparian zones tend to be the preferred corridor for wildlife movement.
3. Connectivity for movement of key species among the large patches, i.e. linkages (both stepping stones and corridors) must be retained and protected. These linkages support ecological connectivity such as daily movements, seasonal migrations, dispersal, habitat connectivity and species persistence.
4. Heterogeneous bits of nature throughout developed areas, i.e. the matrix or surrounding land uses should include natural vegetation so as to facilitate movement within. In an urban landscape, the matrix generally consists of residential, commercial and industrial development.

Within an urban and urbanizing context, such as Edmonton, certain characteristics of an ecological network become extremely important. These include matrix quality, the contribution of semi-natural landscape elements, buffers and restoration.

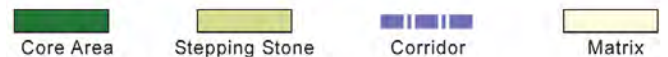
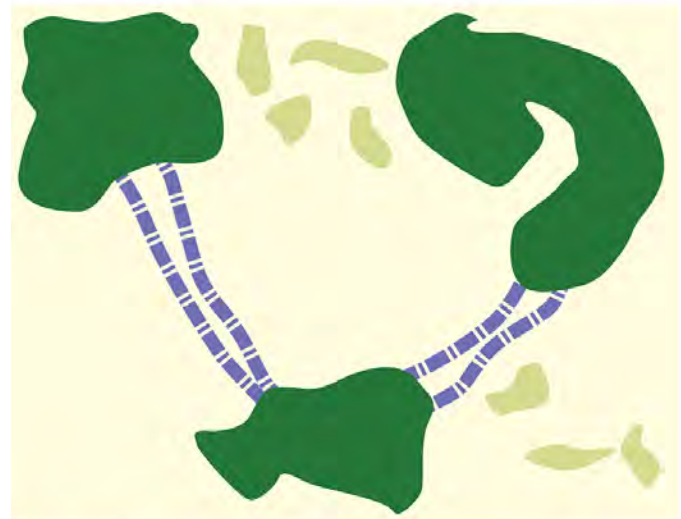


Photo courtesy of City of Edmonton

⁶ Forman, R.T.T. 1995. Land Mosaics: the ecology of landscapes and regions



Matrix quality: the matrix matters

The matrix of an ecological network represents the background within which the core areas and linkages lie. In urban areas, residential, commercial and industrial developments make up the matrix. The permeability of the matrix refers to the ability of species to move within the matrix and relates to connectivity and matrix quality. If the matrix contains a sufficient amount of green and open space and few barriers it is said to be permeable and of high quality. If there is no green or open space and full of barriers it is said to be impermeable and of low quality.

Ideally, the matrix within an ecological network will be relatively permeable and will allow species to move through it to reach core areas. An urban matrix is more complex than a less developed agricultural matrix and is often not very permeable. Therefore it is extremely important to enhance the quality of the matrix in urban areas. One of the simplest ways to enhance matrix quality is to make sure that developed areas contain bits of nature or vegetation throughout. Eliminating and/or mitigating barriers can also enhance matrix quality in urban areas. For example, providing wildlife crossings across roads could improve movement of species through the matrix.

Contribution of semi-natural landscape elements

Semi-natural landscape elements - open green spaces that are not dominated by native vegetation - also offer permeable spaces through which species may move and may also offer limited resources. These might include manicured parkland, greenways, schoolyards, cemeteries, golf courses, conventional stormwater facilities, landscaped boulevards and many rights-of-way.

Within an urban context, larger semi-natural landscape elements play a crucial role in maintaining connectivity by providing stepping stones and corridors between biodiversity core area and other natural areas particularly since the urban matrix is often complex and contains many barriers. That being said, smaller semi-natural landscape elements, especially landscaping within developed areas also play an important connectivity role by enhancing the overall permeability of the matrix. For example, boulevard trees such as Edmonton's mature neighbourhood elm and ash trees provide cover, food and even breeding habitat for birds throughout Edmonton's developed matrix.

Buffers

Ecological buffers allow conflicting land uses to coexist and mitigate edge effects. They are particularly important in urban areas because of the large impact development can have on natural areas and ecological processes. Buffers can also help reduce human-wildlife conflicts. Within urban areas, buffers are often implemented by surrounding a natural area with open space land uses. For example, a natural area may be surrounded by parks and schoolyards with residential and commercial development located further away.

Restoration

As conservation science evolves it is easier to determine where and how past development has negatively impacted the ecological network and also to find and successfully use new restoration techniques. Edmonton is fortunate to still contain all of the elements of a functional ecological network; however, some of these elements are degraded. Restoring core areas and linkages, particularly within the more developed parts of Edmonton, would maximize their potential to contribute to Edmonton's Ecological Network. For example, naturalization of roadside verges can enhance connectivity and restoration of disturbed parts of biodiversity core areas can increase the ability of these areas to support a greater level of biodiversity. Another example of the value of restoration is the naturalization of stormwater management facilities. Once naturalized, these facilities can be considered natural stepping stones.





Defining Edmonton's Ecological Network

The Regional Context

Just as individual natural areas within a network influence and are influenced by surrounding areas, ecological networks influence and are influenced by broader scales. When planning for future urban development and conservation, it is important to remember that local natural systems are connected to larger regional and continental systems. For example while the North Saskatchewan River Valley represents Edmonton's major biodiversity core area and wildlife corridor it also represents a regional biological corridor from the Rockies through the prairies. Big Lake, which not only represents a critical regional biodiversity core area for Edmonton, also provides important bird habitat for all of North America. Figure 5 illustrates the significance of the North Saskatchewan River Valley as a biological corridor, and how it connects Edmonton to adjacent municipalities and beyond. Failure to conserve this unique landscape feature could make Edmonton a barrier to the movement of wildlife in central Alberta and disrupt critical natural processes.

Conservation of natural areas and ecological processes is particularly important because of Edmonton's position in the region.

- The City of Edmonton contains portions of three sub-watersheds of the North Saskatchewan: Beaverhill, Strawberry and Sturgeon. Watersheds are important management units particularly with respect to hydrology and related ecological processes.
- The City of Edmonton lies within the Parkland Ecoregion. Parkland is a mosaic of aspen dominated tree stands, wetlands and grasslands and represents the transition zone between boreal forests and prairie grasslands. As an ecotone, or transition zone, it supports a high diversity of both boreal and prairie species, making its conservation critical to adjacent ecoregions.



Photo courtesy of Jennifer Meers

Aside from the North Saskatchewan River Valley, Edmonton no longer contains significantly large natural areas within City limits. However, Edmonton is fortunate to be surrounded by relatively undeveloped areas that include several large natural areas as shown in Figure 4. The 2006 State of Natural Areas report identified three of these natural areas immediately adjacent to the city limits to be of particular significance as regional biodiversity core areas: Big Lake, Enoch First Nations Reserve and the North Saskatchewan River Valley upstream of the City boundary. These sites not only provide source populations for Edmonton's ecological network they also abut directly to natural areas within the City thereby resulting in physical or structural linkages and larger core areas. It is important to note that while these larger natural areas fall outside City jurisdiction our actions can still have an impact on them. Fortunately, many of these areas have their own conservation initiatives.



Figure 4: Edmonton's regional context



Map by: Sponcor Environmental Management Services Ltd.
 Prepared for: City of Natural Areas, City of Edmonton.
 Map produced: October 2005



Edmonton's Ecological Network Structure

Edmonton's landscape is a mosaic of heterogeneous patches of green embedded in a matrix of developed and agricultural lands. The 2006 State of Natural Areas report states that Edmonton has a functional ecological network and suggests that careful land use and management will enable growth and development to occur in harmony with natural areas conservation. Building on this study and other conservation science and planning literature, the City of Edmonton has identified the following structural components for Edmonton's ecological network. Figure 6 illustrates these components. It is important to note that Figure 6 is intended to be used for illustrative purposes to show how the elements of an ecological network are applied to Edmonton's landscape and does not infer ownership nor protection status. Revisions may occur as more detailed information is available.

Regional Biological Corridor:

The North Saskatchewan River Valley is the most critical component for wildlife movement and ecological processes in Edmonton and the surrounding area and so has been identified as a regional biological corridor. Overall, the ecological connectivity of the North Saskatchewan River Valley should be protected and restored where it has been degraded. It is important to note that the river itself represents a barrier to most wildlife movement and that connectivity is required along both banks.

Biodiversity Core Areas:

These are natural areas large enough to support entire populations of different species. Larger areas likely support populations of many types of species including larger ungulates; smaller areas likely support populations of smaller species such as small mammals and songbirds. Many core areas also represent linkages to larger scale core areas. For example, Mill Creek is a corridor to the North Saskatchewan River Valley but can also be classified a local biodiversity core area. Smaller or lower quality biodiversity core areas have been identified to provide conservation planning opportunities, including restoration to help maintain some of Edmonton's largest natural areas. Two types of biodiversity core areas are distinguished in Figure 6. Regional biodiversity core areas represent very large natural areas that fall both within and outside municipal limits; whereas biodiversity core areas represent large natural areas that lie entirely within City limits. Figure 6 shows three regional biodiversity core areas and ten biodiversity core areas.

Linkages:

Stepping Stones and Corridors provide structural and/or functional connections between biodiversity core areas and the regional biological corridor within Edmonton's ecological network. Stepping stones are non-linear features; corridors are linear features. Both types of linkages can be distinguished into two major types: natural and semi-natural. Natural linkages are sites that are dominated by native vegetation in natural occurring patterns (such as natural areas, naturalized stormwater management facilities, naturalized parks and some pipelines) whereas semi-natural linkages are more manicured green spaces (such as active recreation parks, schoolyards, cemeteries, conventional stormwater management facilities and some rights-of-way).

Matrix:

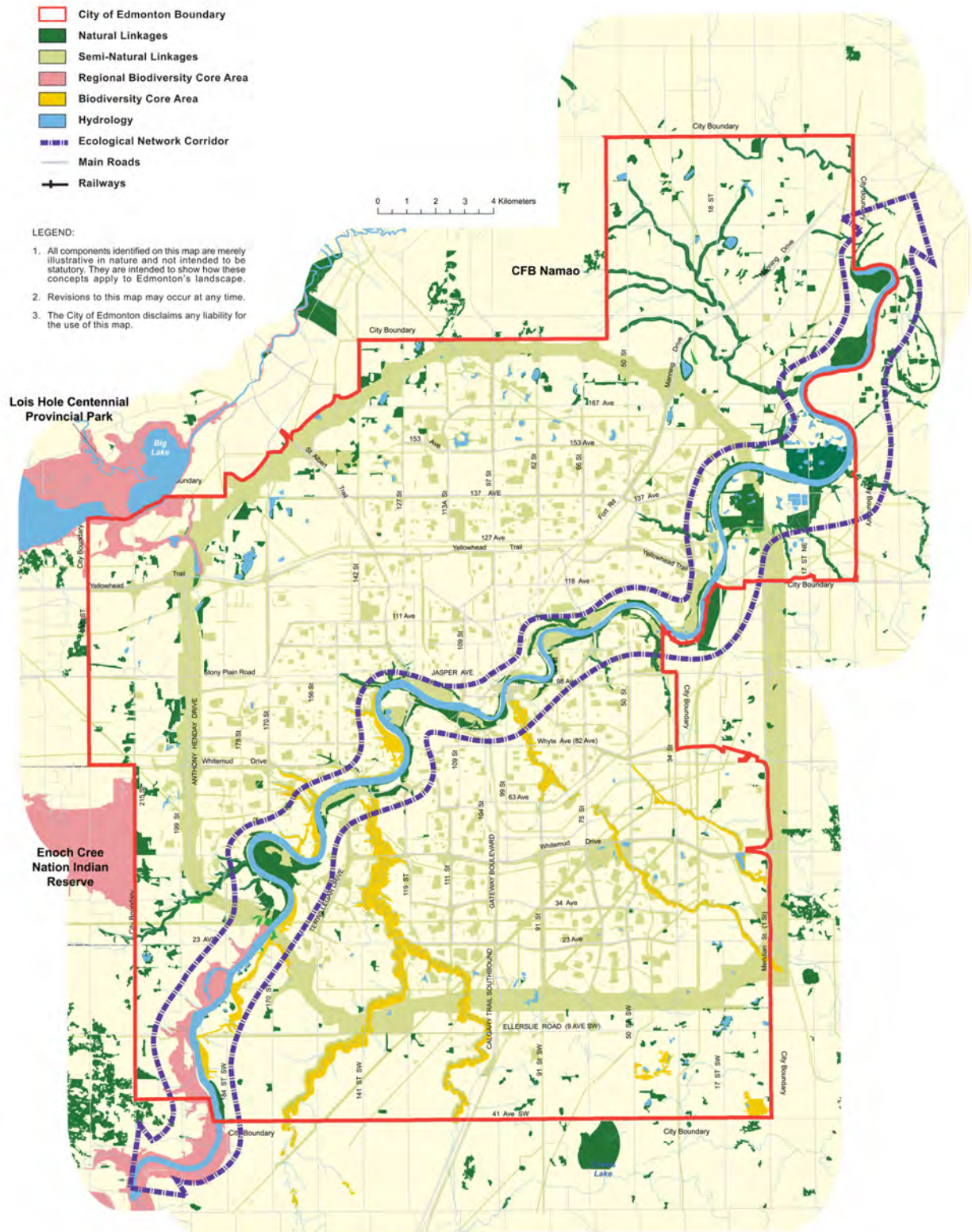
The matrix is all of the land not considered to be part of the regional biological corridor, biodiversity cores areas or linkages. Edmonton's matrix consists of residential, commercial and industrial development as well as agricultural lands in the more rural portions of the City. It can significantly influence overall connectivity. For example, more compatible land uses adjacent to biodiversity core areas and more naturalization efforts can help to increase connectivity.

Folk talk about the "heart of a city" being its downtown core.... in Edmonton, I feel the heart, the spirit of our city is the river that gives us and all living things life.

~ Natural Connections Public Engagement Process Participant



Figure 5: Edmonton's Ecological Network



Relevance of These Approaches to the Edmonton Context

The approaches taken to the development of this Plan is particularly relevant to Edmonton's planning and conservation contexts. Figure 7 represents Edmonton's conservation system which includes both a spatial component - the ecological network – and an organizational component – the community conservation network.

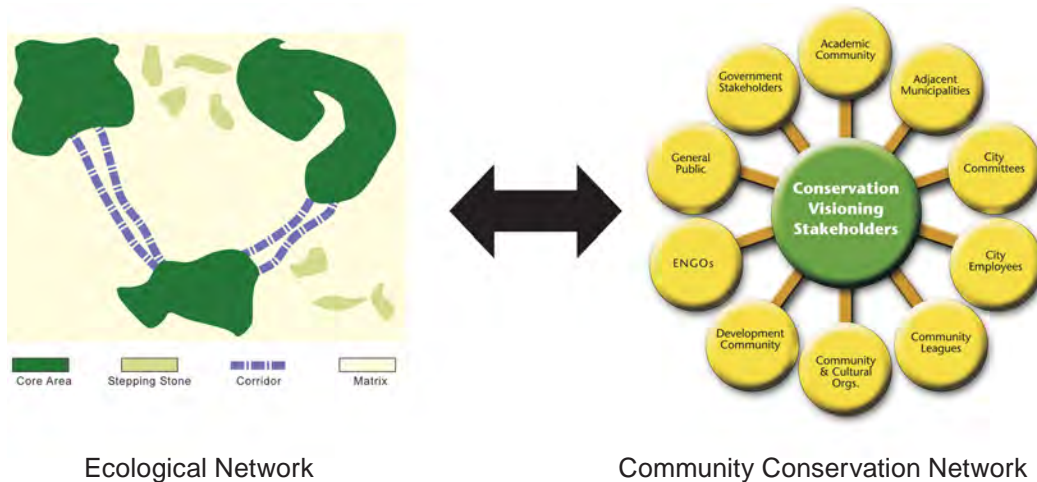


Figure 6: Edmonton's Conservation "System"

Applicability of Outcome-Based, System Approach

The outcome-based approach is easily adapted to the City's existing system of conservation planning and allows for evolutionary change in the City's existing land development priorities and procedures. As well, outcome-based planning and evaluation are well suited to Edmonton's conservation planning context, which is characterized by many players working in a variety of functions throughout the organization, including planning and managing our parks system, land drainage, transportation and emergency response. External players include other levels of government, non-government environmental organizations, and citizens.

A fundamental philosophy- underlying the Natural Connections Strategic Plan is that conservation should be integrated into all of the City's decision-making processes. Although, traditionally, each branch or department has tended to implement strategies independently, more and more the City is seeing the benefits of working collaboratively, in partnership, or through other types of associations. A system approach accommodates the many internal and external contributors to achieving Edmonton's conservation vision.



Photo courtesy of Sheri Hendsbee



Photo courtesy of City of Edmonton

Applicability of Ecological Network Approach

Using an ecological network approach is particularly suitable for Edmonton for four main reasons:

1. Conservation science has shown that protection of individual natural areas has not been successful in maintaining ecological functions and biodiversity and that ecological connectivity can be more important than isolating natural areas from human activity.
2. The structure of an ecological network works well within an urban and urbanizing context by balancing both conservation of biodiversity and sustainable development. Particularly important in urban and urbanizing areas such as Edmonton is the contribution of semi-natural landscapes in conserving ecological functions and biodiversity.
3. According to the 2006 State of Natural Areas Report, Edmonton still contains the elements of a functional ecological network. With careful land use and management decisions, growth and development can occur in harmony with natural areas conservation.
4. In the past, natural areas within the river valley and those within the tablelands were covered under separate plans and policies despite their obvious ecological links. An ecological network approach will integrate these natural areas into one conservation system.

The remainder of this document outlines the Strategic Plan components, and introduces our approach to the implementation of the plan. A detailed implementation plan will be prepared following policy and strategic plan approval.

"Celebrate your organization's hard work and empower your organization to learn from unexpected news."

~ Canadian Outcomes Institute





Section 3: Strategic Plan Components

Policy Statement

Vision

Guiding Principles

Goals

System Outcomes and Indicators

Strategic Directions and Strategies

Ecological Planning Areas





Photo courtesy of Sheri Hendsbee

Strategic Plan Components

Defining the Plan Components

Vision:

A description of the ideal future state of the organization.

Guiding Principles:

Shared beliefs that energize consistent action.

Goals:

Broadly defined strategic positions or conditions that the organization desires to reach through which the vision may be achieved.

System Outcomes:

Measurable statements of achievement that lead to the accomplishment of a goal. In the short-term and through the long-term, they provide indicators of progress.

Strategic Directions:

Courses of action required to overcome the gaps between the current situation and the vision.

Strategies:

Detailed courses of action that support a strategic direction.

System Indicators:

Measurement of progress toward the achievement of an outcome.



Policy Statement

Natural Connections is supported by a corresponding municipal policy that will be presented to City Council in July 2007 for approval.

“Since Edmonton was settled more than 100 years ago, the natural environment has supported us and shaped our collective identity. Our citizens are proud of our natural heritage. To safeguard our natural capital and the associated ecological services, the City of Edmonton is committed to conserving, protecting, and restoring our natural uplands, wetlands, water bodies, and riparian areas, within an integrated and connected system of natural areas throughout the city. These areas provide essential habitat for plants and animals, and maintain a high quality of life for current and future citizens by providing critical ecological services, as well as, opportunities for education, research, appreciative forms of recreation, and aesthetic and spiritual inspiration.

The City of Edmonton will balance ecological principles with economic and social considerations in its decision making and demonstrate that it is done so.

The City of Edmonton recognizes that it can accomplish the work that is required more efficiently and effectively by supporting and developing partnerships to achieve effective conservation results. Therefore, the City will lead by example - seeking to engage the public in natural areas issues, and to encourage businesses, residents, and the community to secure new natural areas and steward what we have effectively.”

– Natural Areas Systems Policy, 2007

Vision

A system of conserved natural areas, ecologically and effectively managed, connecting the river valley with tableland natural areas, restored green spaces and regional natural areas, and recognized and supported by the community of Edmonton as a valued asset.

Guiding Principles

1. Build capacity for ecological protection in Edmonton. Natural areas protection and management are complex and large-scale issues, and ones which will require the cooperation of many partners. The Office of Natural Areas is well-positioned to lead, partner with and coordinate other organizations in aspects of this work. This will result in strengthened community capacity for conservation.
2. Engage the community in conservation and management of natural areas to harness existing local knowledge and raise awareness. The scope of natural areas conservation is beyond the capacity of the City of Edmonton to manage alone; partnership arrangements are essential to successfully implement conservation goals. Partnerships will also enable the City to leverage differing levels of knowledge and expertise available in the local community. Accordingly, the City will promote natural areas as a common good and conservation as a collective responsibility.
3. Think continentally and regionally, and plan locally. Ecological boundaries must be considered at different spatial scales ranging from the site level to regional, continental and global scales. In addition, ecological boundaries almost never coincide with administrative boundaries. It is essential that this be recognized in the decision-making process. Decisions made locally can have significant consequences beyond local borders.
4. Align with existing conservation plans, aiming to be additive rather than redundant. Other orders of government and non-government organizations have developed a wide range of conservation plans. The City of Edmonton will find ways to align its goals and objectives with those of other plans and form partnerships where possible.



5. Use best available science. The City's efforts must be grounded in current conservation science. Because the knowledge base of conservation science is continually improving, implementation of the plan must adapt to this changing knowledge base.
6. Balance public interest with property rights. Implementation requires a balance between the public interest and the rights and responsibilities of individual property owners.
7. Balance conservation with recreation. Edmontonians value natural areas, in part, for the unique recreation opportunities they provide. At the same time, inappropriate human use can degrade these areas and compromise their ecological integrity. Appropriate use can be aligned to conservation objectives.
8. Promote Edmonton's ecological network as a context to which urban development must be tailored, not the opposite. An ecological network that is viable into the future must maintain diversity at genetic, species, population, and ecosystem levels. Consequently, it is essential that ways be found to accommodate urban development while, at the same time, protecting the ecological network and integrating other social and aesthetic benefits.
9. Embrace innovative approaches to conservation. If we are to achieve significant change, it is critical that the City be open to new and innovative approaches to securing and managing natural areas.

Goals

Three interconnected, mutually supportive goals have been developed to support the development and implementation of Natural Connections.

SECURE a Functioning Ecological Network

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

Proactive natural systems planning, site acquisition through a suite of existing approaches, and the development or application of new approaches will be crucial to securing the network. Approaches will include acquiring new sites within the means of the City budget and the limits of provincial enabling legislation, restoring and connecting key network elements, and encouraging the dedication of private lands through conservation easements and incentive programs.

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.

Stewardship and monitoring programs will help the City to ensure the network components – core areas, riparian corridors, linkages and stepping stones – and the flora and fauna supported within each of Edmonton's ecological communities are protected both for their intrinsic value and for the many benefits they provide to Edmontonians.

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.

Much of the current success of natural areas conservation in Edmonton has been the result of combined efforts with individuals and organizations in the private, public and non-government sectors. Natural Connections will encourage the growth of this conservation culture. Engaging the community will enable the City to share information, draw upon the expertise and experience of knowledgeable community members, and identify opportunities for collaboration with conservation organizations and other orders of government.



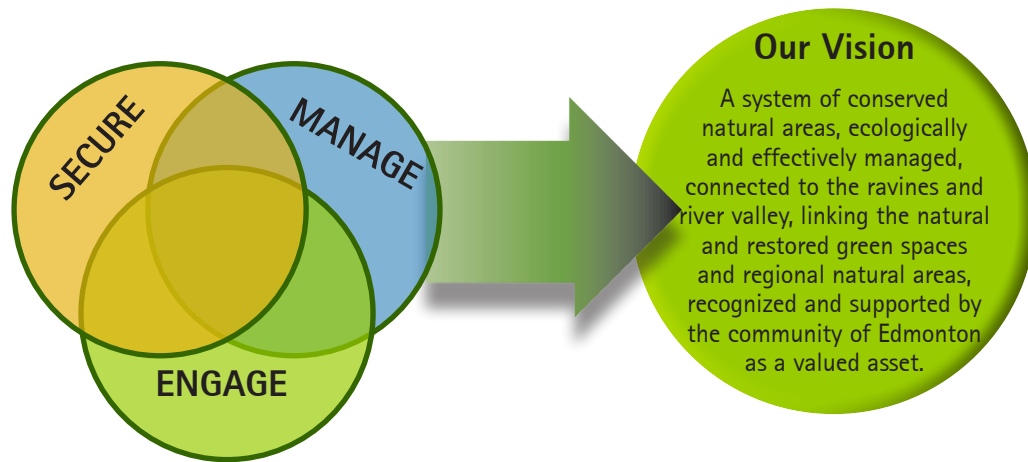


Figure 7: The Strategic Plan includes three interconnected, mutually supportive goals.



Photo courtesy of April Mitchell



System Outcomes

Each system outcome is supported by a set of system indicators, outlined in Section 4 of the Strategic Plan. Each outcome supports one or more of the goals – the relation between the two components is not necessarily a linear one.

1. The protection of Edmonton's existing natural areas has been maximized (all possibilities explored and every opportunity taken), and restoration of additional lost, degraded or fragmented areas is increasing.
2. Connectivity within Edmonton's ecological network is increasing.
3. The quality of managed natural areas is increasing due to effective management.
4. The community and Administration are increasingly knowledgeable about the value of natural areas and actively involved in their stewardship.
5. Conservation of Edmonton's natural areas is increasingly achieved through partnerships.

Strategic Directions and Strategies

1. Expand Edmonton's ecological network through securement and restoration

Edmonton is extremely fortunate to have all of the elements of a functional ecological network, including core natural areas and linkages (stepping stones and corridors), within its boundaries. The next crucial step is to ensure that these network elements are secured – or in some cases restored – to maintain the structural and functional value of our natural areas systems and the many benefits they provide.

Using the means available to it, the City will expand Edmonton's ecological network by securing and restoring natural systems, and by supporting and partnering with others in this work in the areas where it is appropriate to do so.



Photo courtesy of Sheri Hendsbee

Strategies

- Coordinate the processes of key internal branches – namely Parks, Drainage Services, Land and Buildings, Planning and Energy, Environment and Natural Areas – to identify natural areas for acquisition.
- Ensure the necessary natural systems information is obtained and made available through the planning process, and that the process facilitates the long-term protection of key systems.
- Where possible, secure biodiversity core areas and linkages through purchase from the Natural Areas Reserve Fund, or through dedication of Municipal and Environmental Reserve as per the Municipal Government Act.
- Work with the Edmonton and Area Land Trust to encourage the securement of private natural areas in the form of conservation easements and donations.
- Work with the Government of Alberta to see that it obtains the required information from development applicants in order for it to claim the bed and shore of local water bodies, as it sees fit.
- Work to protect key habitat areas within the City.



2. Increase the City's Capacity for Conservation Planning



Photo courtesy of Sheri Hendsbee

As the pace of development increases, it is becoming increasingly important to take a proactive approach to planning – one that enables the early identification and description of natural systems within the area in question. Such information allows the protection of natural areas and the connections among them. The emerging field of conservation planning encourages the integration of natural areas into new neighbourhoods, and the restoration of degraded sites. The range of innovative tools available for such conservation is growing, and communities and stakeholders are recognizing the many benefits to this approach.

The City will ensure that conservation is given equal weight to other considerations in the planning process and that decisions concerning natural systems are based on the best available conservation science.

Strategies

- Ensure that development proponents clearly understand natural systems information requirements and understand the means by which such information is to be considered by City staff in the evaluation of development applications.
- Ensure that natural areas are considered early in the planning process so they can be effectively integrated into structure plans and protected through development.
- Ensure that agricultural lands are recognized for their connective and supportive habitat value.
- Adopt a systems approach to conservation planning, ensuring that proposed development is sensitive to both the structure and function of natural systems being integrated into new neighbourhoods.
- Acknowledge the significance of the North Saskatchewan River Valley as a regional biodiversity corridor, and ensure that planning decisions reflect this designation.

3. Increase Capacity for the Management of Natural Areas



Photo courtesy of Sheri Hendsbee

A wide range of stewardship and restoration projects have been undertaken or are currently underway in Edmonton, facilitated by both non-government organizations and the City. However, until now, these projects have been carried out in the absence of a formalized, comprehensive framework and shared goals. Better coordination of these efforts will ensure the most effective use of resources, clear delineation of roles and responsibilities, and advance the City's understanding of natural areas management objectives and practices.

Using the means available to it, the City will increase capacity for ecological stewardship by implementing programs and practices that establish clear management roles and responsibilities, support the efforts of conservation organizations and private corporations, and reflect a watershed approach to the management of Edmonton's natural systems.

Strategies

- Develop a clear corporate natural area management program and set of practices that is understood by all staff, particularly those responsible for implementation.
- Develop guiding documents that outline best practices for various aspects of natural areas management (e.g., wetlands, riparian areas, tree stands, etc.)



- Use management plans to develop clear management goals and objectives for each protected natural area (including appropriate use), ensure they are understood by operations staff, developers and the public, and that there is adequate capacity to operationalize them.
- Actively monitor natural systems and the implementation of management plans, and use this information to evaluate management needs.
- Broaden the scope of focus from the site to the neighbourhood, sub-basin and region.
- Protect both the structure and function of natural areas.
- Work to improve the quality of “stepping stone” sites, ecological corridors, and the matrix generally through naturalization.
- Facilitate community engagement in stewardship, monitoring and restoration of natural areas on public and private lands.

4. Build a Well-Connected Network of Conservation Partners.

It has long been recognized in Edmonton that effective conservation is best achieved through partnerships. Partnerships have enabled the City and other organizations to share information, work more effectively and support one another in what can be a complex and sometimes difficult endeavor. This approach has resulted in the protection, restoration and sound stewardship of several key natural areas in the City, through formal and informal means. It is essential that the City continue to build upon this tradition of partnership to achieve its conservation goals.

The City will work within its means to establish a well-connected network of conservation partners, including conservation and other community groups, landowners, the development and academic communities, adjacent municipalities, and other orders of government, to foster the sharing of information and expand organizational capacity.

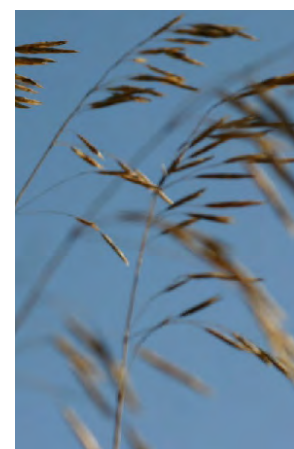


Photo courtesy of Sheri Hendsbee

Strategies

- Establish a Regional Conservation Network, including representation from key conservation groups, adjacent municipalities and provincial and federal departments, to work cooperatively to achieve common goals
- Work with developers and landowners to achieve “win-win ecology” that protects natural systems and processes, is economically rewarding, and respects the interests of property owners.
- Partner with other Alberta municipalities and the provincial government to expand the conservation provisions of the Municipal Government Act.
- Partner with the Edmonton and Area Land Trust to encourage the conservation and sound stewardship of privately-owned natural systems.
- Provide administrative and financial support to existing community conservation initiatives, as appropriate.



5. Support a System of Shared Conservation Education



Photo courtesy of Sheri Hendsbee

The field of ecology is complex and constantly evolving. In addition, human impacts on the natural systems that surround and sustain us are often not immediately apparent. As a result, it can be difficult to comprehend the innumerable benefits these systems provide us, and easy to overlook the extent to which we depend on them. The City recognizes its responsibility to communicate this value, and to report on its progress toward the achievement of its conservation goals.

However, the City is not the only repository for information about local natural systems. For decades, local conservation organizations have collected critical data on plant and animal species in Edmonton. In addition, many Edmontonians have come to know the City's natural areas intimately, making them holders of valuable local ecological knowledge and, potentially, important partners in education.

The City will develop education programs that increase Edmontonians' recognition and appreciation of the value of Edmonton's natural areas systems and the ecological processes they support, and will establish internal processes to capture and integrate the local ecological knowledge of community members.

Strategies

- Encourage the understanding of key ecological terms, current trends in conservation and loss, and conservation efforts being made internally and externally.
- Encourage the understanding of the many benefits natural areas provide Edmontonians, including ecological services and quality of life enhancements.
- Coordinate the City's communication of conservation initiatives to ensure it is clear and consistent.
- Provide Edmontonians with the knowledge they need to make lifestyle decisions that do not negatively impact natural areas.
- Work to move community members towards the leadership end of the "stewardship scale" (aware steward lead).
- Work with schools and local youth programs to instill in young people a strong understanding of the value of natural areas.
- Establish processes and tools to capture, store and make accessible the local ecological knowledge of Edmontonians.
- Work with private landowners to share information about the value of naturalization of residential, commercial and industrial land, and techniques for accomplishing it.



6. Enhance Edmonton's Culture of Ecological Innovation and Excellence

While there are several examples of innovative ecological planning, partnership and development in Edmonton, these projects could be much better supported. In addition, we can no longer afford for such efforts to be unique if Edmonton's natural systems and ecological processes are to be adequately protected; therefore, an ecological approach to planning and development should become the norm.

The City will strive to establish Edmonton as a leading municipality in conservation, and will pursue innovative approaches to secure and manage its ecological network.



Photo courtesy of Sheri Hendsbee

Strategies

- Adopt innovative ecological approaches to development and construction, internally and in partnership with the development community.
- Showcase the implementation of pilot projects that demonstrate ecological development principles, including the effective integration of natural areas into the urban fabric.
- Where appropriate, offer incentives for the private protection of natural areas through the promotion of existing programs (e.g., the Ecological Conservation Assistance Program) and the development of new ones.
- Report annually on City and partner conservation initiatives to celebrate successes and share this information widely within the community.
- Engage Council at a strategic level to champion Edmonton as a conservation community.
- Encourage the establishment of new organizations aimed at expanding Edmonton's capacity for innovation.

7. Increase the Accessibility and Integration of Information.

The size and complexity of large municipal corporations can be an impediment to the collection, storage and sharing of information. In addition, it can be difficult to incorporate community knowledge into information systems. However, new information technology, the strengthening of partnerships and good organizational coordination can facilitate the improved integration and sharing of information, resulting in a better basis for decision-making for all partners.

The City is committed to increasing the accessibility of all natural areas systems information, within the corporation and from the community, and to ensuring that this information is current and comprehensive.



Photo courtesy of Sheri Hendsbee

Strategies

- As information becomes available, build an inventory of natural areas (including biodiversity) and ensure that it is accessible to all Edmontonians.
- Obtain and incorporate community knowledge about Edmonton's natural areas into the City's inventory of information in order to make better planning and management decisions.
- Align City policy on natural areas across all departments and, where appropriate, align municipal policy with the policies of community organizations and other orders of government.
- Ensure there is a shared understanding within the Administration of the processes related to the acquisition, protection, management and restoration of natural areas.
- Ensure that the benefits of ecological services are considered in municipal cost-benefit analyses and Edmonton's infrastructure inventory.



Ecological Planning Areas

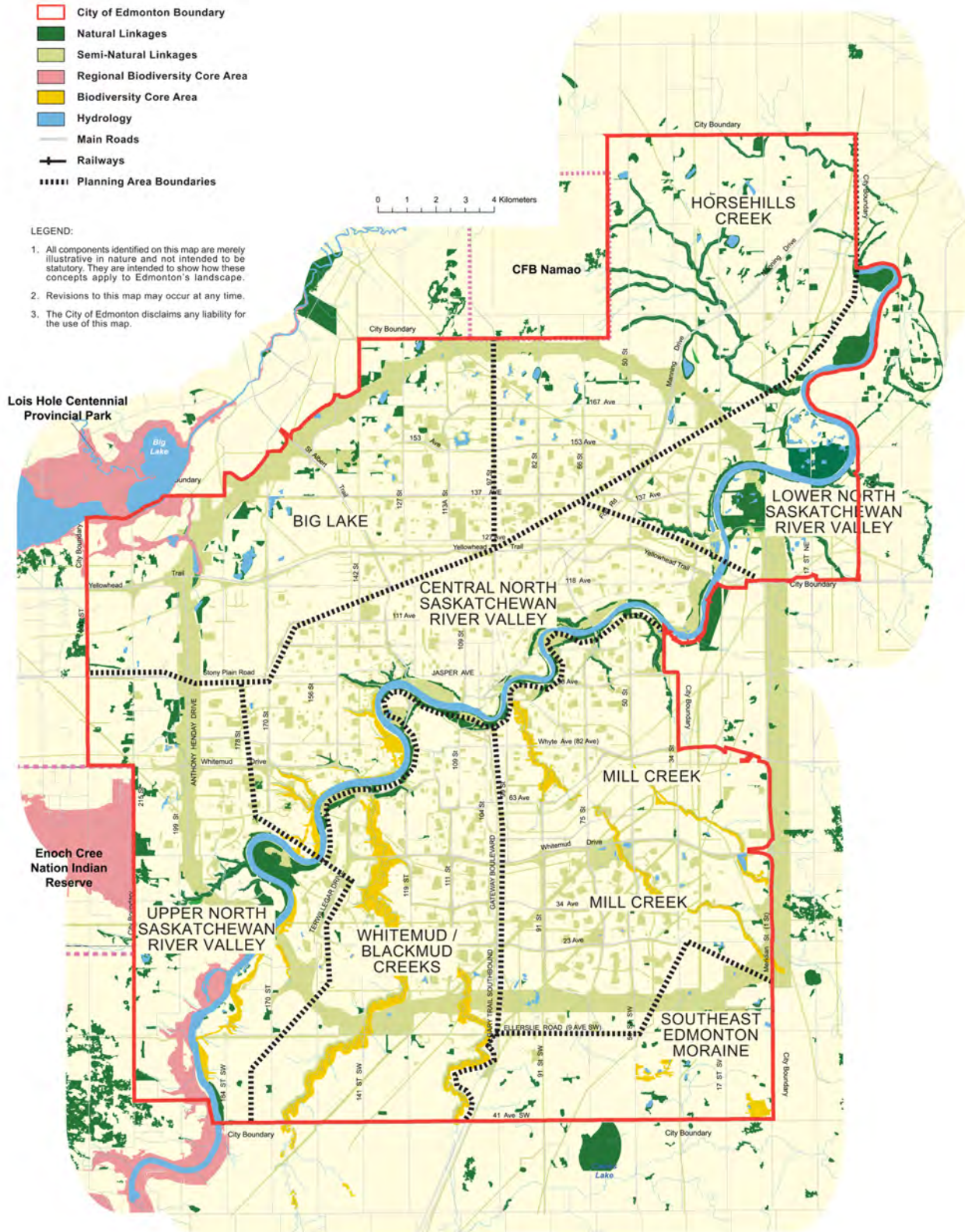
The City of Edmonton has identified eight planning areas within its ecological network. These planning areas are based on biodiversity core areas and natural ecological linkages, shown on the map on the next page. It is important to note that these planning areas are all interconnected and not meant to be considered as discrete ecological units but rather as strategic areas for conservation planning. Each planning area contains a least one biodiversity core area (including regional biodiversity core areas) and likely contains several natural and semi-natural linkages.

The eight planning areas are:

- Big Lake
- Whitemud/Blackmud Creeks
- Upper North Saskatchewan River Valley
- Central North Saskatchewan River Valley
- Lower North Saskatchewan River Valley
- Horsehills Creek
- Mill Creek
- Southeast Edmonton Moraine



Figure 9: Ecological Planning Areas



Section 4:

Towards Implementation

Towards an Implementation Plan
System Indicators



Towards an Implementation Plan

An adaptive management approach is critical to the success of Natural Connections. Separating Edmonton's conservation plan into separate strategic and implementation components enables City Council to adopt the high-level goals, outcomes, strategic directions and strategies in the Strategic Plan for several years without change, while the separate Implementation Plan will provide the civic administration with sufficient flexibility to respond to emerging circumstances, resource allocations and organizational change.

As depicted in Figure 2, it will be important for the City to assess the effectiveness of the Strategic Plan using the system indicators and to adjust its strategies as required if the system outcomes are not being met.

The Implementation Plan will expand on the specified strategies by outlining key actions to support each, as well as identifying responsible parties, timelines, budgetary forecasts and additional system indicators. The development of the Implementation Plan will involve key internal and external stakeholders.

The Implementation Plan will also be heavily influenced by Edmonton's participation in an international biodiversity project.

In May 2007, Edmonton joined ICLEI's Local Action for Biodiversity Project⁷, a worldwide project to promote biodiversity through local governments. Edmonton's participation is a ten-year commitment to develop an Action Plan and Framework that includes:

- support for local biodiversity projects and initiatives;
- increasing global awareness of the importance of biodiversity at the local level;
- documentation and demonstration of global biodiversity best practices at the local level;
- documentation and demonstration of biodiversity management and implementation tools;
- enhancing global networks, communication and information sharing among cities;
- lobbying for financial support from other orders of government, national and international agencies for biodiversity-related development projects.

⁷ ICLEI (Local Governments for Sustainability) is an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development. ICLEI's membership includes more than 550 cities, towns, counties, and their associations worldwide.



System Indicators

The following indicators correspond to the system outcomes identified in Section 3 of this document. The list is not exhaustive; as the Implementation Plan is developed, it is likely that additional indicators will be identified.

Outcome 1:

The protection of Edmonton's existing natural areas has been maximized, and restoration of additional lost, degraded or fragmented areas is increasing.

Indicators:

- #/% of natural areas protected through current planning process
- #/% natural areas protected in each ecological planning area
- #/% core areas/stepping stones protected
- area of land restored to a natural state

Outcome 2:

Connectivity within Edmonton's ecological network is increasing.

Indicators:

- #/% stepping stones/linkages protected between each core area
- "nearest neighbour" index (proximity of each stepping stone to others in area, # stepping stones within a given radius of a given natural area/core area)
- structural/functional connectivity – gap tolerance

Outcome 3:

The quality of natural areas is increasing due to effective management.

Indicators:

- % of protected natural areas under active management (management plan in place, regular monitoring to ensure effective implementation)
- level of biodiversity at each site (based on annual species counts)

Outcome 4:

The community and Administration are increasingly knowledgeable about the value of natural areas, and actively involved in their stewardship.

Indicators:

- level of community, Administrative awareness (as measured by an annual, random survey)
- number of people involved in active stewardship (as estimated by conservation groups on an annual basis)
- number of "master naturalists", number of neighbourhood stewardship groups (that have "adopted" and regularly monitor natural areas)

Outcome 5:

Conservation of Edmonton's natural areas is increasingly achieved through partnerships.

Indicators:

- number of new partnerships dedicated to conservation (as described qualitatively in an annual report, and/or through an annual survey of conservation organizations)





Glossary

Biodiversity Core Area: A habitat patch capable of supporting entire populations of plants and animals and associated ecological processes.

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.

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.

Corridor: Natural or semi-natural linear vegetated patches that enhance movement among other habitat patches such as core areas or natural stepping stones.

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.

Ecological Planning Area: Strategic conservation planning areas, each including at least one biodiversity core area and several natural ecological linkages.

Ecological Services: Services which humans derive from ecological functions such as photosynthesis, oxygen production, and water purification.

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.

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.

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 schoolyards are not natural areas.

Natural Landscape Elements: Sites that are dominated by native vegetation in naturally occurring patterns (such as natural areas and naturalized stormwater management facilities or parks).

Outcome-Based Planning: An approach that focuses on planning for and measuring our impact on the achievement of desired system-level outcomes.

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.

Restoration: The re-establishment of habitat in order to improve ecological processes or connectivity.

River Valley: The North Saskatchewan River Valley and associated system of tributary ravines.

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).

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.

Systems Planning: An approach that considers not only the parts of the “system” (wetlands, treestands, the City of Edmonton, Edmontonians, conservation organizations), but also the relationships between those parts, and the emergent properties that result from their interaction.

Tablelands: The upland areas above the North Saskatchewan River Valley and Ravine System.



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